

## The effect of modification “throwing-catching ball” in manipulative skill intellectual disability children

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### Abstract

The purpose of the research is to know the effect on the modification of “throwing-catching ball” in manipulative skill intellectual disability children. This study used quasi-experimental with a pretest-posttest design. Based on sampling technique with purposive sampling, this research used 10 samples. This research used the throwing-catching the ball instrument test. After analyzing data, value of the pretest was obtained with an average value of 3,8, minimum data 1, maximum data 6, and with a range of 5. Meanwhile of the posttest was obtained an average value of 10, minimum data 6, maximum data 2, and with range 6. Based on the results of t test showed  $0,005 < 0,05$ . Meaning that there is an effect on the modification of “throwing-catching ball” in manipulative skill intellectual disability children. Hopefully, this research can be used as a basis for the next research, by paying attention on characteristics of intellectual disability children who require special assistance and learning and be more creative in developing game models to improve the manipulative skill on intellectual disability children.

**Keywords:** modification, manipulative skill, intellectual disability.

### INTRODUCTION

People with mental disabilities can be considered as one of the vulnerable groups particularly affected by current life conditions (da Silva & Silva, 2009). Children with disabilities and their parents want the same youth sports opportunities as children without disabilities, but there are many barriers that prevent such opportunities (Lucas, 2017).

Children with special needs are children with special characteristics such as intellectual disability (ID) that are different from children in general. ID is a challenge that is hard enough for most parents, not a few parents who complain that taking care and caring for children with ID require extra energy and attention because it is not as easy as doing it in normal children, but parents should address such things positively in order to find the correct steps in order to optimize the development and the potential of

the child ([Kesumawati et al., 2018](#)).

According to the World Health Organization, intellectual disability (ID) is defined as follows: "Intellectual disability means a significantly reduced ability to understand new or complex information and to learn and apply new skills (impaired intelligence). This results in a reduced ability to cope independently (impaired social functioning), and begins before adult hood, with a lasting effect on development. Disability depends not only on a child's health conditions or impairments but also and crucially on the extent to which environmental factors support the child's full participation and inclusion in society ([Mkabile & Swartz, 2020](#)).

Mentally retarded children are children who have intellectual disabilities with an Intellectual Quotion (IQ) below the average of normal children ([Martinus & Kesumawati, 2020](#)) the level of a person's intelligence, in general, is usually measured through an intelligence test where the results are called the IQ test (intelligence quotient), IQ. for mentally retarded children are divided into: a) Mild intellectual disability usually has an IQ of 70-55 b) Moderate intellectual disability usually has an IQ of 55-40 c) Severe mental retardation usually has an IQ of 40-25 d) Very severe mental retardation usually has an IQ <25 ([Hidayati, 2016](#)).

Mentally retarded children experience obstacles and underdevelopment in intellectual mental development far below the average in such a way, so they experience difficulties in academic, communication and social tasks, and therefore require special education. Mentally retarded children have the same rights in obtaining a proper education as stated in Law No. 20 Year 2003 of the National Education System Article 5 Paragraph (2): Citizens who have physical, emotional, mental, intellectual, and / or social disabilities are entitled to education specifically ([Andhini, 2017](#)). It is hoped that through education it can help them in carrying out their daily activities. Physical activity (PA) participation is widely recognized as a critical component of health and development for disabled and non-disabled children ([Ross et al., 2016](#)). All children both normal children and children with special needs must be involved in

activities that require these basic movements so that they become independent in carrying out activities. A child's basic movements aimed at improving basic movement skills and coordination naturally become the main goal in carrying out daily physical activities. In an effort to carry out various activities aimed at maintaining health, increasing physical fitness, and improving basic movement skills in sports for intellectual disability children in particular.

The fundamental motor skills, consisting of locomotor skills, manipulative skills, and non-manipulative skills, are building blocks for successful participation in many sports and various physical activities (Chen *et al.*, 2016). The basic skills that will be discussed above are efforts to develop kinesthetic intelligence (movement intelligence) related to the typical motor development characteristics of elementary school age children and include locomotor patterns such as walking, running, jumping, and rolling, non-locomotor such as twisting, pushing, pulling, and stretching, while manipulative such as kicking, throwing, hitting, and catching (Supriyanto, 2008).

Basic motor skills are developed during the child before school and in early school, and this will be the initial provision for obtaining efficient movement skills that are general in nature and will then be used as a basis for the development of more specific motor skills, all of which are an integral part motor achievement for children of all ages and levels. That studying functional forms of motion can provide the basis for all other motion skills. Fundamental movement skills are very important to improve the quality of life of mentally retarded children. There are several ways that can be done to improve physical and motor skills, one of them through games. Game is one form of motion activity in physical education. Physical education is the process of education through physical activities, games or sports chosen to achieve educational goals (Soemantri, 2006).

Adaptive Physical Education is a program that is individualized which includes physical, fitness, movement patterns and basic movement skills, skills in water activities, dancing, sports games both individuals and

teams are designed for children with special needs. In one of the adaptive physical education activities that matches type of retardation mental is a disability through sport play. The game is a major social activity in children. It is necessary to have modifications to sports for mild retardation mental so that students can play the game according to his ability. On the other hand modified sports aim to minimize accidents / mistakes in this activity and to facilitate children with intellectual challenges in gaining knowledge about exercise and can improve students' basic motion manipulative light retardation mental (Ardiyansyah, 2017).

Manipulative movements are movements that are more complex because they involve the limbs to manipulate objects outside the body. Manipulative movements are usually described as movements that play with certain objects as a medium, or skills that involve a person's ability to use parts of his body to manipulate objects outside himself (Nugraha, Mahendra & Herdiyana, 2018). Manipulative movement skills are basic movement skills related to manipulation related to the coordination of hands, feet and other body parts. Manipulative motion is also often interpreted as a movement that coordinates with the space and objects around it (Mirawati & Rahmawati, 2017). The ability to throw, catch and kick are manipulative abilities that are indispensable during development. Because this skill can support the need for movement at the age of children (Kustiawan et al., 2019). Manipulative motion is one of the basic activities performed by the limbs using objects, such as: kicking, throwing, pushing, hitting, bouncing, as well as rolling, receiving, catching, catching and so on (Sumantri & Endrawati, 2013).

Previous studies that both researched to improve manipulative skills, namely 1) According to Martinus & Kesumawati (2020) a study "Implementation of Manipulative Skill for Intellectual Disability Children SDLB C Palembang" where the results showed 16 people (76.19% The average student was in the good category, the difference in this study used a quantitative descriptive approach with survey techniques, preparing my research was using quasi-experimental with pretest and

posttest designs. Where there was treatment of the sample, namely the modification of throwing and catching the ball, namely: a) throwing-catching at the wall, b) catching in pairs, c) throwing in groups. 2) According to Nugraha, et al. (2018) the investigation on the effectiveness of teaching manipulative skill is done by applying movement education model through utilizing the Graham's movement analysis framework. The results of data processing and analysis, a progressive increase in percentage from the start of the initial learning results to the learning outcomes in cycle 2 of action 2. In the initial observation the percentage of the results on the practice of manipulative movement was 42.80%, and the percentage in the second cycle of action II was 78 12%. So, it can be ignored that the educational model of preparation with a framework of motion analysis framework (movement analysis framework) can improve students' manipulative archetypes. The difference in this research was using classroom action research (PTK). 3) According to Arifin & Kumaat (2017) with the research entitled " the influence on the modification of throw-catch ball game for coordination move manipulative of Intellectual disability SMPLB-C Alpha Kumara Wardhana II Surabaya. The instruments of this research used motor fitness test with modification to throw on the target with move coordination. The result of this research obtained the average coordination move manipulative on pretest 4,64 times of pitch and posttest was 5,50 times of pitch. The accounting of difference test average of coordination move manipulative before and after given modification throw-catch ball game obtained  $t_{\text{observation}}$  2,747, the value of  $t_{\text{table}}$  with significance of 0,05 with  $df = 13$  was 1,771. Because  $t_{\text{observation}}$  was bigger from  $t_{\text{table}}$  ( $2,747 > 1,771$ ). It can be concluded that there is the influence of modification on throw-catch ball game for coordination move manipulative. The difference with my research is the sampled used as well as the test instruments and modification on throw-catch ball game.

From that, why researcher want to do research on the effect of game modifications to capture catch throwing to improve the basic

manipulative ability of mentally retarded children in Elementary Schools with Special Needs, can be implemented based on programs to improve the development of manipulative skill of intellectual disability children

Throwing-catch is a fundamental movement skill. Where the throwing and catching of the ball is a basic movement of all sports of small ball games and large ball games that use both hands or one hand. Throwing- catching game is a movement to swing the ball towards a particular object. Modification of throwing and catching of the ball, are: 1) throwing-catching to the wall, 2) throwing catching in pairs, 3) throwing-catching in groups.



**Figure 1.** Modification of throwing and catching of the ball

Based on this background the researcher made a study on the effect of modification to “throwing-catching ball” in manipulative skill intellectual disability children.

## **METHODS**

This study used quasi-experimental with a pretest-posttest design. This research is an experimental study, said to be an experimental because this study will examine the cause and effect relationship of the effect on the modification of “throwing-catching ball” in manipulative skill intellectual disability children of SLB Pembina Palembang elementary school students. The research design is as follows:

**O<sub>1</sub> X O<sub>2</sub>**

Information:

O<sub>1</sub> = pretest (throwing-catching test),

X = experiment

O<sub>2</sub> = posttest (test throwing-catching test).

The sampling technique in this study was purposive sampling of children aged 7-8 years. So, after conducting the study, 10 samples were obtained based on the specified criteria. The instrument of manipulative ability test is done by throwing catching ball

**Table 1.** Fundamental Movement Skill Assessment from Throwing-Catching

No	Indicator	Category		
		C	Cwh	Cnt
1	Throw the ball with 2 hands			
2	Throw the ball with 1 hand			
3	Catch the ball with 2 hand			
4	Catch the ball with 1 hand			
Maximum total = 12				

Information: C: Can, Cwh = Can with help Cnt= Can't

The assessments given for the basic mobility test are described as follows:

- a. Category "can" (C), Given a score of 3. This score is obtained if from 3 times doing a minimum of 2 times the child can do it well himself.
- b. Category "Can with help" (Cwh). This score is obtained if from 3 times trying to do, 2 times a child can do with help
- c. Category "Can't" (Cnt) given a score of 1, this score is obtained if from 3 times trying to do, 2 times the child cannot do well even though it has been helped.

**RESULTS**

In measuring manipulative skills using a throwing-catching test. In analyzing research data, it was used several statistical tests, namely: 1) Descriptive Test. 2) Normality Test. 3) Hypothesis Test. The results obtained in this study will be explained as follows: Descriptive data

analysis was carried out to obtain an overview of research data. Descriptive data is intended to interpret the data.

**Table 2.** Descriptive Statistics Pretest dan Posttest

Result	N	Min	Max	Range	Sum	Mean	Standar Deviation	Variance
Pre-test	10	1	6	5	38	3,8	1,619	2,622
Post-test	10	6	12	6	100	10	2,108	4,444

The table 2 is before and after the match which can be stated as follows: Before being given treatment, obtained an average value of 3.80, minimum data of 1, maximum data of 6, and with a range of 5, After being given treatment, obtained an average value of 10, minimum data 6, maximum data 12, and with a range of 6. Next, test of normality. Normality test is performed to determine whether the data distribution has been normal. Data is said to be normal if the significance value > 0.05.

**Table 3.** Normality Test Result

	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	Df	Sig.
Pre-test	.151	10	.200*	.950	10	.673
Post-test	.229	10	.148	.859	10	.074

a. Lilliefors Significance Correction

\*. This is a lower bound of the true significance.

From the table above it shows that the data are normally distributed where based on pretest data it shows  $0,200 > 0,05$  and posttest data shows  $0,148 > 0,05$ . So, the pretest and posttest data are normally distributed. Hypothesis Test The data analysis used was a statistical analysis that will illustrate the effect of modification on "throwing-catching ball" in manipulative skill intellectual disability children. Hypothesis testing was done using technical analysis of data Paired Sample t-test. In the Paired-Sample t-test analysis, the data are said to have differences if the indicated significance value is  $< 0.05$ . The test results are as follows:

**Table 4.** Hypothesis Test

	Posttest – Pretest
Z	-2.818 <sup>a</sup>
Asymp. Sig. (2-tailed)	.005

a. Based on negative ranks.

b. Wilcoxon Signed Ranks Test

Table 4 summary on the results of paired t test variables Sig. (2-tailed) pre-test and post-test that is 0,005, if the p value <0.05 shows that there is a significant difference. From the test results it is found that the significance value is 0,005 <0.05 meaning that there are differences in the results of throwing-catching ball test for pretest and posttest, if the result of calculation  $t_o$  (t-observation) is higher than  $t_t$  (t-table),  $t_o > t_t$ ; the null hypothesis ( $H_o$ ) is rejected. If the result of calculation  $t_o$  (t observation) is lower than  $t_t$  (t table),  $t_o < t_t$ ; the null hypothesis is accepted. Since the scores obtained from the result of calculating, the alternative hypothesis ( $H_a$ ) is accepted and the null hypothesis ( $H_o$ ) is rejected. In other word, the writer hypothesis is accepted. It means that there are significant differences between modification “throwing-catching ball” in manipulative skill intellectual disability children. Based on the results of the data analysis, it is proven that there is an effect of modification “throwing-catching ball” in manipulative skill intellectual disability children.

## DISCUSSION

Children with intellectual disabilities are children who have mental retardation or have below average intelligence. One of the mentally retarded children's characters is lacking coordination of the movement (Nursalim, 2007). Movement coordination is a very important movement for mentally disabled people, especially in daily life. So it needs a way to improve their coordination of motion by using the play method. The method of playing in sports learning will help foster their motivation and enthusiasm for adaptive sports material, because children with special needs are mentally retarded to prefer things that are fun and exciting.

Playing is essential to the social, emotional, cognitive, and physical wellbeing of children beginning in early childhood. It is a natural tool for children to develop resiliency as they learn to cooperate, overcome challenges, and negotiate with others. Play also allows children to be creative. It provides time for parents to be fully engaged with their children, to bond with their children, and to see the world from the perspective of their child (Milteer *et al.*, 2012).

The teacher's efforts in developing basic manipulative movement skills for children through sports games are as follows: 1) providing tools or materials that attract children's attention in developing basic manipulative movement skills through sports games, 2) providing direction and examples to children in develop basic manipulative movement skills through exercise, 3) observe the child during the process of developing basic manipulative movement skills through sports games (Hendra & Putra, 2019).

Sports games are a learning approach that can be applied to intellectual disability children through the playing method. Because learning through the playing approach will make students happy and not easily bored with what is being ordered. The throwing-catching movement is one of the basic manipulative movements that have a direction and purpose, namely the movement of swinging the hand in a certain direction so that this throw and catch game model can be applied to train the manipulative movements of intellectual disability children.

As research conducted by Arifin & Kumaat (2017) stated that the game of throwing and catching with the ball is a game played in pairs by alternating throwing and catching the ball. This game aims to train collaborative movement coordination between the eyes, hands and feet, so as to improve their coordination skills. Modification of the game on throwing and catching ball when applied to adaptive sports defense in children with mild mental retardation can improve coordination of manipulative movements (Arifin & Kumaat, 2017).

Based on the results of the study the benefits of modifying the game of throwing and catching ball to the manipulative motion abilities of elementary school SLB coaches who have been obtained based on the results of throwing-catching ball test. Before being treated using a modified game of throwing and catching ball based on the results of the pretest shows the average value of throwing and catching ball for mentally retarded children coached by SLB in total of 3,80. Then after being given treatment the results of the posttest showed the average value of the ability to throw the ball at 10. From the results of the t test for the ability to catch the ball obtained t count was 0,005,  $t_{\text{count}} < t_{\text{table}} < 0,05$ , then  $0,005 < 0,05$ , so it was concluded that there was an effect of modification “throwing-catching ball” in manipulative skill intellectual disability children.

## **CONCLUSION**

From the results of the research analysis and discussion, it can be concluded that there is an effect of modification on “throwing-catching ball” in manipulative skill intellectual disability in SD SLB Pembina Palembang.

Based on the results of the above research the suggestions that can be put forward are: 1) Be an input to the sports teacher regarding the modification of the game of throwing and catching the ball especially the intellectual disabilities that based on the test is very useful as supporting physical education learning, 2) Introducing how to practice manipulative skill for intellectual disabilities children and know the abilities they have. 3) Modification of throwing-catching game can be used as one form of effective adaptive learning to fundamental movement skill manipulative in intellectual disabilities children 4) As a study on the development of sports science in accordance with the results of research and use other methods related to manipulative skill. Hopefully, this research can be used as a basis for the next research by focusing attention on characteristics of intellectual disability children who require special assistance and learning and be more creative in developing game models to improve the manipulative skill on intellectual disability children.

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