

Learning Approach for Hand Eye Coordination and the Kinesthetic Outcomes of Learning to Throw-Catch a Ball

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Abstract

The purpose of this study was to investigate the effects caused by the methods of teaching and eye-hand coordination to kinesthetic outcomes of throwing and catching a ball. The population of this study was 149 third grade elementary school students in a village in East Jakarta. A sample of 80 students was chosen using random cluster sampling. Data was analyzed using analysis of variance (ANOVA) and the significance level is set at 0.05. The results showed that the kinesthetic of ball's throw-catch by students who were taught with play teaching method is higher than the students who were taught with the guided teaching methods. There is an interaction between teaching methods, gender and hand eye coordination towards the kinesthetic outcomes of throwing and catching a ball. The kinesthetic result of ball's throw-catch for male students who were taught with play teaching methods is higher than the male students who were taught with guided hand-eye-coordination teaching method. The kinesthetic result of ball's throw-catch for female students who were taught with play teaching methods is higher than the female students who were taught with guided hand-eye-coordination teaching method. The kinesthetic result of ball's throw-catch for male students with low hand-eye coordination taught with guided teaching method is higher than those who were taught with the play teaching method. The kinesthetic result of ball's throw-catch for female students with low hand-eye coordination taught with the guided teaching method is higher than those taught with the play teaching method.

Keywords: learning, hand-eye coordination Kinesthetic

1. Introduction

One aspect of education that constantly developed through research is the learning process, in an attempt to generate models of appropriate learning. Basically a universal theory in teaching is needed that focuses on learning as an aspect of human behavior that stands alone. Physical education, as a component of the overall education, has been recognized by many. However, in practice, the teaching of physical education has not been effective as expected. According to Mark Guthrie (2008), the skill of throw and catch is less developed among children and will remain so, if the shortage is not addressed. Although children's basic ability to catch a ball has decreased, this does not diminish the motivation of physical education teachers because this skill can be nurtured through effective teaching in physical education. Therefore, approaches that can develop children's potential is needed. Approaches used are based on theories as reference aim to develop children's skills.

Dauer and Pangrazi (1992) states that catching a ball is a skill that is important in a variety of activities and should be trained with a different object, in different opportunities and challenges. Basic motion of the skills in the throwing and catching a ball includes manipulative skill. The definition of manipulative skills is the ability to move or reposition heavy objects from one position to another (H. Abdul Kadir Ateng, 1992). According to Johnson and Nelson (2005), kinesthetic skills is the ability to move the body parts or the whole body in performing muscle movements.

According to Stassen (2008), children's play activities are referred to as mastery play, or play to master certain skills because these activities can be an exercise for children to master new skills through repetition. Method of playing is one form of activity in the learning process of physical education. This is due to play in physical education are part of learning. Furthermore Jensen (2007), said playing would give children a chance to learn motor skills, emotional, social and cognitive development in an environment that can support the learning process.

W. J. S. Poerwadarminta (2007), states that guided means to lead, educate or teach. Furthermore, to educate is to lead children toward maturity. Children have the following symptoms: finding form, has no permanence, no independence, seem easy to change, weak, need help, so easily distracted, and do not have a fixed belief (Ngalim Purwanto). Further it is said that when they got the perceptive guidance and coaching, they can choose the best way to learn and understand the skill and how and why they do it (Dauer & Pangrazi). Asmawi states that technique or method that guide is the most common method in the learning process, where children are guided in various ways through the patterning of movement. This methods have some goal for example to reduce errors and ensure that the proper motion pattern has been done (Asmawi, 2011). Guided learning process ensures students to perform skills correctly.

2. Methodology

The population of this study was a total of 149 third grade elementary school children in East Jakarta.. Sample is determined using cluster random sampling consisting of 80 children. Statistical analysis used in this study is the analysis of variance with the significance level set at 0.05. The samples were divided as shown in Table 1.

Table 1. Grouping of samples

		Teaching Methods	
		Playing (A1)	Guiding (A2)
Hand-eye Coordination	High (B1)	A1-B1	A2-B1
	Low (B2)	A1-B2	A2-B2

The samples were tested to determine their hand-eye coordination and divided into high coordination group (B1) and low coordination group (B2). These groups were further divided into two and taught the throw-catch skill using playing teaching method and guided teaching method. Therefore, A1-B1 are children with high hand-eye coordination who were taught throw-catch skill using the playing method; A2 - B1 were children with high hand-eye coordination who were taught the throw-catch skill with the guided method; A1 - B2 were children with poor hand-eye coordination who were taught the throw-catch skill with playing method; and, A2 - B2 were children with poor hand-eye coordination who were taught throw-catch skill with the guided method.

There were six hypotheses for this study and they are:

- 1) Kinesthetic learning outcomes of throwing and catching a ball for children who were taught with the playing teaching method are higher than children who were taught with guided teaching methods.
- 2) There is an interaction between teaching methods, gender and hand-eye coordination toward the kinesthetic learning outcomes of throw-catch a ball.
- 3) The kinesthetic learning outcomes of throw-catch a ball among male children with high hand-eye coordination who were taught with play teaching method are higher than children who were taught with guided teaching method.
- 4) The kinesthetic learning outcomes of throw-catch a ball for female children with high hand-eye coordination who were taught with play teaching method are higher than children who were taught with guided teaching method.
- 5) The kinesthetic learning outcomes of throw-catch a ball for male children with low hand-eye coordination who were taught with play teaching method are lower than children who were taught with guided teaching method.
- 6) The kinesthetic learning outcomes of throw-catch a ball for female children with low hand-eye coordination who were taught with play teaching method are lower than children who were taught with guided teaching method.

3. Results and Discussion

Statistical analysis conducted to test the hypothesis is shown in Table 2.

Table 2. Results of ANOVA

Tests of Between-Subjects Effects				
Dependent Variable: Kinesthetic Learning Outcomes Throw Catch Ball				
Source	Type III Sum of Squares	Df	Mean Square	F
Corrected Model	9217.087 ^a	7	1316.727	127.408*
Intercept	239257.813	1	239257.813	23150.870*
B	94.613	1	94.613	9.155*
C	891.112	1	891.112	86.225*
A	475.312	1	475.312	45.992*
B C	86.113	1	86.113	8.332*
B A	7430.512	1	7430.512	718.985*
C A	74.113	1	74.113	7.171*
B C A	165.313	1	165.313	15.996*
Error	744.100	72	10.335	
Total	249219.000	80		
Corrected Total	9961.187	79		

R Squared = .925 (Adjusted R Squared = .918)

Description:

A = Method of teaching

B = Hand-eye Coordination

C = Gender

Post-hoc test were then conducted to answer the hypothesis stated. The first hypothesis states kinesthetic learning outcomes of throwing and catching a ball for children who were taught with the playing teaching method are higher than children who were taught with guided teaching methods. From the analysis of variance table for teaching methods (A), result showed that $F=45.992$, $p < 0.05$, then the proposed hypothesis is empirically accepted as true. The average score of kinesthetic learning outcomes of throw-catch a ball using play teaching method was 57.18, while the average score of learning outcomes of throw-catch a ball with a group of children who are taught guided teaching method is 52.25. Thus, the kinesthetic learning outcomes of throw-catch a ball for children who were taught with playing teaching method are higher than kinesthetic learning outcomes for children who were taught with guided teaching methods.

The second hypothesis states that **there** is an interaction between teaching methods, gender and hand-eye coordination toward the kinesthetic learning outcomes of throw-catch a ball. Results showed that there is a significant interaction between teaching method, gender and hand eye coordination ($F=15.996$, $p < 0.05$), and therefore the hypothesis is accepted.

Table 3. Summary of the results of Tukey's test

No	Compared Group	Q value
1	$\mu_{31} = \mu_{32}$	24.60*
2	$\mu_{41} = \mu_{42}$	22.74*
3	$\mu_{52} = \mu_{51}$	18.82*
4	$\mu_{62} = \mu_{61}$	9.41*

The third hypothesis states that the kinesthetic learning outcomes of throw-catch a ball for male children with a high hand-eye coordination and taught with play teaching method are higher than those taught with guided teaching method. Tukey tests (see Table 3) was conducted for this analysis and results showed that there is a significant influence ($Q=24.60$, $p<0.05$) between male children with high hand-eye coordination taught with play teaching method ($\bar{X} = 72.70$ and $s = 11.732$) than those taught with guided teaching method ($\bar{X} = 47.60$ and $s = 10.275$). Therefore the hypothesis is proven.

The fourth hypothesis states that the kinesthetic learning outcomes of throw-catch a ball for female children with high hand-eye coordination who were taught with play teaching method are higher than the students who were taught with guided teaching method. Tukey tests (see Table 3) was conducted for this analysis and results showed that there is a significant influence ($Q=22.74$, $p<0.05$) between female children with high hand-eye coordination taught with play teaching method ($\bar{X} = 63$ and $s = 2.82$) than those taught with guided teaching method ($\bar{X} = 39.8$ and $s = 1.87$). Therefore the hypothesis is proven to be true.

The fifth hypothesis states that kinesthetic learning outcomes of throw-catch a ball for male children with low hand-eye coordination and taught with guided teaching method are higher than those taught with play teaching method. Tukey tests (see Table 3) was conducted for this analysis and results showed that there is a significant influence ($Q=18.82$, $p<0.05$) between male children with low hand-eye coordination taught with guided teaching method ($\bar{X} = 65.60$ and $s = 2.38$) than those taught with play teaching method ($\bar{X} = 46.3$ and $s = 1.767$). Therefore the hypothesis is proven.

The sixth hypothesis states that the kinesthetic learning outcomes of throw-catch a ball for female children with low hand-eye coordination taught with guided teaching method are higher than those taught with play teaching method. Tukey tests (see Table 3) was conducted for this analysis and results showed that there is a significant influence ($Q=9.41$, $p<0.05$) between female children with low hand-eye coordination taught with guided teaching method ($\bar{X} = 56.10$ and $s = 3.08$) than those taught with play teaching method ($\bar{X} = 46.50$ and $s = 2.79$). Therefore the hypothesis is proven.

4. Conclusions

Based on the research that has been conducted, several conclusions were made. They are as follows:

- 1) The kinesthetic learning outcomes of students who were taught throw-catch a ball with play teaching method are higher than students taught with guided teaching methods.
- 2) There is an interaction between teaching methods, gender and hand-eye coordination toward kinesthetic learning outcomes of throw-catch a ball.
- 3) The kinesthetic learning outcomes of male students with high hand-eye coordination who were taught throw-catch a ball with play teaching method are higher than those taught with the guided teaching method.
- 4) The kinesthetic learning outcomes of female students with high hand-eye coordination who were taught throw-catch a ball with play teaching method are higher than those taught with the guided teaching method.
- 5) The kinesthetic learning outcomes of male students with low hand-eye coordination who were taught throw-catch a ball with guided teaching method are higher than those taught with the play teaching method.
- 6) The kinesthetic learning outcomes of male students with low hand-eye coordination who were taught throw-catch a ball with guided teaching method are higher than those taught with the play teaching method.

Based on the conclusion of the study, it is suggested that since the overall the play teaching methods indicate better results, then teachers, coaches, or prospective teachers should use play method to teach basic psychomotor skills to their students, especially elementary school students. In other words, the throw-catch teaching material using play can be consider in determining the method to be used specifically in teaching and in learning motor skills in general. It is also necessary to consider factors of coordination skills of students in the learning process.

This study found that teaching methods played a significant effect on kinesthetic learning outcomes of throw-catch a ball. Teachers and coaches should be able to provide a variety of teaching methods with respect to the characteristics of the students' taking into account other factor which may hinder the learning of psychomotor skills for example coordination.

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