

# Developing Modified Twister Game to Improve The Ability of Group B Children to Recognize The Concept of Geometric Shapes

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## Abstract

This research is based on the learning activity to improve the ability of 5-6 years old children to recognize the concept of geometric shapes in the kindergarten. Therefore, an appropriate strategy is needed to develop this skill. One of them is by using the modified twister game. The purpose of this study is to generate the step of modified twister game for the growth of the children. The results show that this modified twister game can improve the ability to recognize the concept of geometric shapes.

Keywords: the concept of geometric shapes, modified twister game, early years' children

## 1. INTRODUCTION

Early childhood education (ECD) is a preschool educational institution that stimulates, guides, nurtures and holds learning activities as a means to develop children's ability and skills, from birth until the age of 6 years.

One of the children's aspects to be developed is cognitive. The cognitive aspect, a thinking process, is an ability of individuals to connect, assess, and consider incident or event. The aim is to develop the ability of general knowledge and science, the concept of shapes, color, size, and pattern, a concept of numbers, symbols, numbers, and letters, which will be useful for achieving maximum their potential.

This study chose cognitive skill in recognizing the concept of form, color, size, and pattern by introducing the concept of geometric shapes for early years children performed by teachers in the classroom.

Usiskin (Aini, 2012: vii) suggested that geometry is a branch of mathematics that connects mathematics to the physical world or the real world. This is consistent with the developmental stage of child's thinking, especially thinking in concrete terms (with the object of reality).

Furthermore, introducing the concept of geometric shapes in early childhood can establish the concept of geometry to identify forms and investigate the building and separate images such as rectangles, circles, and triangles Clements, (Wilson, & Sarama, 2004; Hannibal, 1999 Wasik & Seefld 2008: 398).

According to Van Hiele theory, learning to recognize the concept of geometric shapes makes children develop their ability to think through

certain stages and first step to do is by understanding the concepts.

Referring to preliminary study conducted in TK Idhata Laboratorium UNESA Ketintang Surabaya, TK Ketintang Jaya, TK Sartika Surabaya, TK Dharma Wanita Ketintang Surabaya, TK Laboratorium Dharma Wanita UNESA II Tambaksari Surabaya, dan TK Pejajaran Tambaksari Surabaya, it was found that group b children's ability to identify, distinguish, and classify geometric shapes to objects was still less.

Kindergarten children aged 5-6 years should be able to identify, distinguish and categorize geometric shapes. The different accreditation of kindergartens, as accredited in A, B, C, or D, and also the teachers' quality is the major influence on the children's success. TK Lab School UNESA Surabaya Ketintang is accredited A, where The teachers often teach geometric shapes by introducing and distinguishing geometric shapes around the school environment. Kindergartens with B accreditation like TK laboratorium Dharma Wanita UNESA II Tambaksari and TK Panjajaran Tambaksari Surabaya, the teachers teacher through introducing geometric shapes by copying kinds of geometric shapes.

Furthermore, kindergarten with C accreditation like TK Ketintang Jaya, TK Sartika Surabaya and TK Dharma Wanita Ketintang Surabaya. There, The learning is not maximized especially in recognizing geometric forms because of inadequate classrooms. Teachers also rarely introduced geometric shapes to the children.

According to the Principles and Standards for School Mathematics (NCTM, 2000), the basic for children's mathematical development is begun in the early years, especially through their curiosity

and spirit and grow it naturally from their experiences.

Based on the fact in some kindergartens, there must be way to develop children’s cognitive ability to recognize the concept of geometric shapes, that is through games.

Game is a medium that can make children actively think and learn something in the environment (Morrison, 2012: 69). The game is the first way to train sensitivity, imagination, inclination, aptitude and skills of children. The game can also be used to form their natural and intellectual ability. Imaginative or symbolic games help to develop children's intelligence.

One of the games to be implemented in kindergarten is the modified twister game to recognize geometric shapes. This game can be done individually or in group on mat or carpet stretched across the floor containing geometric shapes with different colors. Besides carpet, spinner board is also used as instruction tool to run the game.

Spinner board is a clock-shaped tool divided into four parts; right foot, left foot, right hand and left hand. Each part of the board has four colors with geometric shapes. For example, if hands of clock spins and stops at right foot of spinner board having a triangular geometric shape, the child must put his right foot on mat or carpet with triangular geometric shape. Here, the game is played in turn by children and guided by the teachers. This enables children to develop their cognitive abilities optimally.

Based on the background above, it is necessary to conduct research on the development of the game to improve ability of group b children to recognize concept of geometric shapes. the previous explanation, the research formulate some research questions how is the level of acceptance of modified twister game to improve the ability of group b children to recognize concept of geometric shapes theoretically and practically. The specific problems of this study are how to recognize, identify, distinguish, and classify geometric shapes in modified twister game developed. Thus, the purpose of this study is to produce a modified twister game that can be accepted by user as it is intended to introduce the concept of geometric shapes in kindergarten so that the children can recognize, identify, distinguish, and classify geometric shapes using modified twister game that is developed.

## 2. METHOD

The design of this study is adapted from research, development and Methodology by Brog and Gall (1983: 626) which has 10 steps. The adapted procedures of development by Brog and Gall (1983) are as follows:

Picture 1; the procedure of adapted development by Brog and Gall

<p><b><u>PLANNING STAGE</u></b></p> <ol style="list-style-type: none"> <li>1. Determining the potential and problems of research               <ol style="list-style-type: none"> <li>a. Potential : the modified <i>twister</i> game</li> <li>b. Problem : Introduction of the concept of geometric shapes for children</li> </ol> </li> <li>2. Review the literature and need assessment               <ol style="list-style-type: none"> <li>a. Subject : 5-6 years old children in group B</li> <li>b. Instrument : Interviews and observations</li> </ol> </li> </ol> <p><b><u>PRODUCT DEVELOPMENT STAGE</u></b></p> <ol style="list-style-type: none"> <li>1. Formulating goal game</li> <li>2. Outlining steps game</li> <li>3. Developing product evaluation tools</li> </ol> <p><b><u>PRODUCT TRIAL STAGE</u></b></p> <ol style="list-style-type: none"> <li>1. The expert test, test for candidate users and test for small groups               <ol style="list-style-type: none"> <li>a. subject : Media experts and materials experts</li> <li>b. instrument : Observation and assessment using observation sheet</li> <li>c. analysis : Quantitative and qualitative</li> </ol> </li> <li>2. Revising product assessment using expert test</li> <li>3. Testing the use of the product and product revision of the assessment results</li> </ol> <p>The final product of modified twister game to improve the ability of group b children to recognize the concept of geometric shapes.</p>
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The product trial is conducted by two experts; the media expert, content material specialist and candidate users that is included as follows; the design of test expert used to test the modified twister game for its feasibility, simplicity, accuracy, and properness (product acceptance). The trial will be conducted after the product is completed to determine the advantages and disadvantages of detail manual or guidance package.

Data were collected qualitatively, including assessments scale, testers’ records and observation results. The qualitative data is obtained by suggestions and comments of assessment experts and prospective users of the product. Moreover, the observation result was to determine the feasibility of modified twister game to improve ability to recognize the concept of geometric shapes. While, quantitative data were obtained using observation sheet collected by interview technique.

The assessments scale is developed based on standards for evaluation educational programs, projects and materials which consists of four aspects, namely feasibility, convenience, accuracy and compliance (lattice instruments on media expert, content material specialist and products used by candidate users at kindergarten). The following preparation for instrument draft on modified twister game is as follows;

The reliability test used in this study is internal consistency reliability because the researchers only

test the instrument once. According to Sugiyono (2010: 131), internal consistency reliability testing is done by trying out all the testing instruments, and the data obtained are analyzed using specific techniques.

The reliability test is validated using observation (observation). According Arikunto (2010: 242), observation or observation is made by the observer on object or process as target. Thus, the process how children recognize the concept of geometric shapes is observed by the researcher.

The reliability of observation is conducted by two observers in TK Laboratorium Dharma Wanita UNESA II Tambaksari Surabaya; the analysis of qualitative data is obtained from the suggestion and comments of experts and candidate users. In other words, the data are collected qualitatively to complete the modified twister game to improve the ability of group b children to recognize the concept of geometric shapes in kindergarten. Then, the qualitative data is analyzed using observation check list with following steps: to calculate how many times the same tool/media is used for the same subject, to determine N (value) by multiplying the number of statement (n), with frequency of observation. Then, sum up checklist mark on checklist observation sheet, and the last is totaling the percentage with the criteria for drawing the conclusion.

The criteria determined is as follows; if 1% - 24% of statement on the observation gets checklist mark meaning that the implementation of modified twister game is classified not good; if 25% -49% of statement on observation checklist gets checklist meaning that the implementation of modified twister game is classified as less; if 50% -74% of statement on observation checklist gets checklist meaning that the implementation of modified twister game is classified as good enough; and if 75% -100% of statement t on observation checklist gets checklist meaning that modified twister game is classified as good.

Then, test results are compared with assessment criteria for each of the variable component to know whether it is less or good product. If the percentage value of each aspect is 66% -80% or 81% -100%, meaning that it is classified as good and does not need to be revised. But if the percentage value is lower, meaning that is less and need to be revised.

The data analysis in this study is to test the statistical data to strengthen the hypothesis proposed by the researchers. The design of this study is one-group pretest-posttest design. Thus, the data analysis used Wilcoxon match pairs test techniques to test the hypothesis of two paired samples if its data are ordinal or stratified (Sugiyono, 2010: 134).

### 3. RESULTS AND DISCUSSION

In this study, researchers are trying to develop a modified twister game activities to improve the ability to recognize the concept of geometric shapes in terms of identifying, distinguishing, and classifying geometric shapes for group b children aged 5-6 years.

Table 1. The Calculation Using Wilcoxon Match Pairs Test

No	Pretest Score (XA1)	Posttest Score (XB1)	Difference (XB1-XA1)	Stratified Sign	
				(+)	(-)
1	5	9	+4	15.5	-
2	6	7	+1	2.5	-
3	6	9	+3	11.5	-
4	6	10	+4	15.5	-
5	6	10	+4	15.5	-
6	3	9	+6	19.5	-
7	5	11	+6	19.5	-
8	6	9	+3	11.5	-
9	5	9	+4	15.5	-
10	8	10	+2	7	-
11	5	10	+5	18	-
12	8	9	+1	2.5	-
13	8	11	+3	11.5	-
14	5	8	+3	11.5	-
15	7	9	+2	7	-
16	7	9	+2	7	-
17	7	8	+1	2.5	-
18	6	8	+2	7	-
19	8	9	+1	2.5	-
20	7	9	+2	7	-
Total				<b>T+ =</b>	<b>T = 0</b>
				<b>210</b>	

<sup>a</sup>. Sample of a Wilcoxon Match Pairs Test

Most of the activities related to the ability to recognize the concept of geometric shapes is less innovated. Researchers are trying to develop the easy and interesting modified twister game that is followed by children either in motion or game.

The data (table 1) was obtained from group b children of TK LAB School UNESA Ketintang

Surabaya and analyzed using a non-parametric statistical test with Wilcoxon match pairs test.

From results above, it is known that  $T_{observed}$  is 0. According Sugiono (2010: 136) this score is taken from the small level of score without considering to  $T_{observed}$  compared with  $T_{table}$ .

To know score of  $T$  table, is by determining  $(n, \alpha)$ , where  $n$  = the number of samples and  $\alpha$  = 5% significance, so that  $T$  table is 52. The number of points obtained from  $T_{table}$  is 52, meaning that  $0 < T_{table}$ .

In this study, researchers are trying to develop a modified twister game to improve the ability to recognize the concept of geometric shapes in terms of identifying, distinguishing, and classifying geometric shapes for group b children aged 5-6 years.

Then, the researchers consult to the experts, media specialists and content material experts to determine whether the product result is feasible and appropriate for children's development.

The modified twister game developed by researchers is appropriate for the children or less good so that there will be feedback to repair it based on its feasibility, simplicity, accuracy and properness.

The next step is to test the product used. The trial of the product aims to determine whether the modified twister game activities developed by the researchers is effective or not to increase the ability of children to recognizing the geometric shapes in terms of identifying, distinguishing and categorizing geometrical forms.

The result of test product shows that aspect of feasibility is 80.5%, simplicity is 77.08%, the accuracy is 76.47%, properness is 75% and systematic content of the product (simplicity) is 78.08%.

From the pretest score in table of TK LAB school UNESA Ketintang Surabaya, it is known that the result,, after the implementation of modified twister game, on children's ability to recognize the concept of geometric shapes is still low. But, after the group b children are taught using modified twister game activities effectively and optimally, the post-test result is better.

The results of data analysis show that the modified twister game activities can improve the ability to recognize the concept of geometric shapes for children, proved by score of  $T_{observed}$  is 0, while  $t$  table is 52 or  $T_{observed} < T_{table}$ , where  $H_a$  (alternative Hypothesis) is accepted if  $T_{observed} < t$  table ( $0 < 25$ ) and  $H_o$  (Null Hypothesis) is rejected if  $T_{observed} > t$  table ( $0 - 25$ ).

The results of this study is suitable with the opinion of Morrison (2012: 69) The game is the first way to train sensitivity, imagination, inclination, aptitude and skills of children. The

game can also be used to form their natural and intellectual ability. Imaginative or symbolic games help to develop children's intelligence. Therefore, it can be concluded that modified twister game influences the ability of group b children to recognize the concept of geometric shapes in TK LAB School UNESA Ketintang Surabaya.

#### 4. CONCLUSIONS AND SUGGESTIONS

Based on the results of the study, it is concluded that the modified game twister can significantly improve the ability of group b children to recognize the concept of geometric shapes in kindergarten. It can be seen from the increasing score before and after the implementation of modified twister game. The average score of first observation ( before the implementation of modified twister game) for group b children was 6.2, and 9.15 after modified twister game is implemented.

The result of data analysis using Wilcoxon match pairs test shows that that  $T_{observed} = 0$  is smaller than  $t_{table}$ , thus  $H_a$  (alternative Hypothesis) is accepted if  $T_{observed} < t_{table}$  ( $0 < 25$ ) and  $H_o$  (Null Hypothesis) is rejected if  $T_{observed} > t_{table}$  ( $0-25$ ). Therefore,  $H_a$  (alternative Hypothesis) is accepted. Therefore, it can be concluded that modified twister game influences the ability of group b children to recognize the concept of geometric shapes in TK LAB School UNESA Ketintang Surabaya.

Based on the research conclusion, the researcher can give suggestion as follows;

1. To determine children's preliminary ability to recognize the concept of geometric shapes. We recommend that teachers must pay closer attention to the ability of each children's result, so that teachers can provide the appropriate stimulation for children's development and give

stimulus ability to recognize the concept of geometric shapes for them.

2. We recommend that teachers can make learning activity more interesting, challenging and meaningful so the children do not feel bored when learning.

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