Basketball Learning Model for Children with Autism

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Abstracts: This is a Research and Development (R&D) study for elementary school students aged 10 years to 12 years. It was conducted in three cities in Subang, Purwakarta and Karawang, West Java Province. Respondents were divided into small trials of 20 students, large trials of 60 students, and effectiveness tests of 74 students. The objective of this study is to form a basketball learning model through basketball mini learning specifically for autistic children. The pilot study was conducted by giving questionnaires to teachers, principals, and parents with a total 200 respondents. The study used a descriptive method while the data collection method uses data triangulation, namely questionnaires, interviews, and observations using the random sampling method. The 90-minute learning time used physical education learning time at school conducted face-to-face with a duration of 16 times. Thirty-six basketball learning models were made for children with autism. The instruments consisted of passing, dribbling, and shooting following the standard assessment instruments from the basketball learning curriculum. The data were analyzed using the statistical method of the average difference test (t-test) to determine the effectiveness of the basketball mini learning model. The study results showed that: 1) the basketball mini learning model can be applied in the learning process; 2) the average score of the experimental group was 60.26 > the average control group was 18.29, while the t-count effectiveness test (8,316) > t-table (1.687). It was found that the basketball learning model for autistic children was effectively for elementary school-age autistic students known sig. scores (2-tailed) is 0.00 < 0.05. Based on our findings, it can be concluded that there is a significant difference in effectiveness (real) between the experimental group and the control group in improving learning basketball skills for children with autism.

Keywords: Learning Models, Basketball, Autism, Elementary School Students.

1. INTRODUCTION

According to the Central Bureau of Statistics of the Republic of Indonesia, there are 144,102 students with autistic diagnoses attending Special Schools [1]. Autism is a developmental disorder of neural function and is characterized by inability to communicate both verbal, non-verbal and lack of social skills [2] [3]. One way to communicate autistic children in general is through gestures or sports games [4]. Deficits of social skills cause children to be unable to live independently [5]. Motor and physical exercises have been widely used because they have significant results for stimulating children's social skills through play [6][7][8][9][10][11][12]. In this study, basketball modifications were carried out with criteria of 9-meter court width, 4.5-meter court median, 2.43 meters ring height and using a 5mm ball [13]. Mini basketball is a good intervention for children with autism because it can improve communication skills, improve physical fitness, and improve cognitive function [14-16].

In Indonesia, basketball learning is in the elementary school education curriculum for children with special needs with criteria for ages 10 to 12 years or elementary school age. The preliminary study was conducted in West Java Province involving three regions, namely Subang, Purwakarta and Karawang with a total of 200 respondents consisting of parents, teachers, and school principals. The results of preliminary studies concluded that basketball learning currently has not reached the target set by the curriculum. Therefore, one stage of learning a basketball mini game specifically for autistic children was made:

motivations and producing changes and expansions in the entire innovation system. In this case, the principal variable is human talent. Table 1 details the aspects of provision, organization, maintenance, development, and audit of the strategic management of human talent (Table 3). These aspects are closely related and interdependent,

so any change in one of them influences the others, requiring adjustments and adaptations in the whole system from a systemic perspective that considers the subsystems within it.

Table 1. Learning Stages

Activities		Description
1	Touch ball	Holding the ball movement is where the teacher stands in front of the child facing each other. The ball is held by the teacher then the child is instructed to hold the ball together. The purpose is to recognize the ball and improve the child's ability to control the ball and train fine motor fingers.
2	Ball Handling	Holding the ball movement together is where the teacher stands in front of the child facing each other. The student's feet were opened shoulder-width apart and the student holds the ball with both hands on the right and left sides of the ball. The teacher holds the ball with both the upper and lower hands of the ball, and then the teacher teaches to move the ball forward which aims to recognize the ball and improve the child's ability to control the ball and train fine motor fingers.
3	Passing 1	Passing the ball movement with the teacher's position is in front of the student 0.5 meter away. Students hold the ball with both hands on the right and left of the ball position in front of the chest. Legs are opened shoulder-width apart and knees bent. Next, the teacher gives instruction to pass forward and the ball is caught by the teacher then passes back to the student. This is for you to recognize the ball and improve the child's ability to master and pass the chest and train fine motor fingers and arm muscles.
4	Passing 2	Passing the ball movement with the teacher's position is in front of the student 1 meter away. Student holds the ball with both hands on the right and left, the position of the ball in front of the chest, legs are opened shoulder-width apart and bent. The teacher then gives instructions to pass forward and the ball is caught by the teacher then passes back to the student. This aims to recognize the ball and improve the child's ability to control the ball and pass the chest and train fine motor fingers and arm muscles.
5	Passing 3	Passing the ball movement with the teacher's position is in front of the students 1.5 meters away. Students hold the ball with both hands on the right and left. The ball in front of the chest and legs is opened shoulder-width apart and bent. Next, the teacher gives instructions to pass forward and the ball is caught by the teacher then passes back to the student. This aims to recognize the ball and improve the child's ability to control the ball and pass the chest and train fine motor fingers and arm muscles.
6	Passing 4	Passing the ball movement with the teacher's position is in front of the students 2 meters away. Students hold the ball with both hands on the right and left, the position of the ball in front of the chest, legs opened shoulder-width apart and bent. Next, the teacher gives instructions to pass forward and the ball is caught by the teacher then passes back to the student. This aims to recognize the ball and improve the child's ability to control the ball and pass the chest and train fine motor fingers and arm muscles.
7	Passing 5	Passing the ball movement with the teacher's position is in front of the students 2.5 meters away. Students hold the ball with both hands on the right and left, the position of the ball in front of the chest, legs opened shoulder-width apart and knees bent. Next, the teacher gives instructions to pass forward and the ball is caught by the teacher then passes back to the student. This aims to recognize the ball and improve the child's ability to control the ball and pass the chest and train fine motor fingers and arm muscles.
8	Passing 6	Passing the ball movement with the teacher's position is in front of the students 3 meters away. Students hold the ball with both hands on the right and left, the position of the ball in front of the chest, legs opened shoulder-width apart and knees bent. Next, the teacher gives instructions to pass forward and the ball is caught by the teacher then passes back to the student. This aims to recognize the ball and improve the child's ability to control the ball and pass the chest and train fine motor fingers and arm muscles.
9	Bounce touch	Holding the ball movement together where the teacher stands in front of the child facing each other. The student's feet opened shoulder-width apart and the student holds the ball with both hands on the right and left sides of the ball. Teacher holds the ball with both the top and bottom hands of the ball. Next, the teacher teaches to move the ball down. This aims to recognize the ball and improve children's ability to master the ball and train fine motor fingers.
10	Bounce pass 1	Passing the ball movement with the teacher's position is in front of the students 0.5 meters away. Students hold the ball with both hands on the right and left and position the ball in front of the chest. Legs are opened shoulder-width apart and knees bent. Next, the teacher gives instructions to bounce the ball down. The ball is caught by the teacher then passes back to the student. This aims to recognize the ball and improve the child's ability to control the ball and pass the chest and train fine motor fingers and arm muscles.
11	Bounce pass 2	Passing the ball movement with the teacher's position is in front of the students 1 meter away. Students hold the ball with both hands on the right and left. The position of the ball is in front of the chest and legs open shoulder-width apart and knees bent. Next, the teacher gives instructions to bounce the ball down and the ball is caught by the teacher then passes back to the student. This aims to recognize the ball and improve the child's ability to control the ball and pass the chest and train fine motor fingers and arm muscles.
12	Bounce pass 3	Passing the ball movement with the teacher's position is in front of the students 1.5 meters away. Students hold the ball with both hands on the right and left, the position of the ball in front of the chest and legs are opened shoulder-width apart and knees bent. Next, the teacher gives

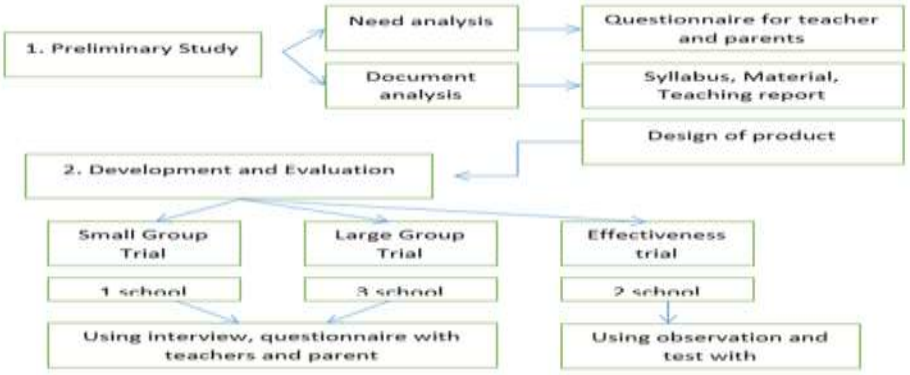
		instructions to bounce the ball down, then the ball is caught by the teacher and then passes back to the student. This aims to recognize the ball and improve the child's ability to control the ball and pass the chest and train fine motor fingers and arm muscles.
13	Bounce pass 4	Passing the ball movement with the teacher's position is in front of the students 2 meters away. Students hold the ball with both hands on the right and left. The ball is in front of the chest legs are opened shoulder-width apart and the knees are bent. Next, the teacher gives instructions to bounce the ball down, then the ball is caught by the teacher and then passes back to the student. This aims to recognize the ball and improve the child's ability to control the ball and pass the chest and train fine motor fingers and arm muscles.
14	Bounce pass 5	Passing the ball movement with the teacher's position is in front of the students 2.5 meters away. Student holds the ball with both hands on the right and left, the position of the ball in front of the chest, legs are opened shoulder-width apart and knees bent. Next, the teacher gives instructions to bounce the ball down, then the ball is caught by the teacher and then passed back to the student. This aims to recognize the ball and improve the child's ability to control the ball and pass the chest and train fine motor fingers and arm muscles.
15	Bounce pass 6	Passing the ball movement with the teacher's position is in front of the students 3 meters away. Student holds the ball with both hands on the right and left. The ball in front of the chest legs is opened shoulder-width apart and the knees are bent. Next, the teacher gives instructions to bounce the ball down, the ball is caught by the teacher then passed back to the student. This aims to recognize the ball and improve the child's ability to control the ball and pass the chest and train fine motor fingers and arm muscles.
16	Dribbling touch	The movement of dribbling with the position of the teacher is behind the students. Teacher holds both hands of students and students hold the ball with both hands on the right and left. The ball in front of the chest legs is opened shoulder-width apart and the knees are bent. Next, the teacher gives instructions to bounce the ball on the floor repeatedly. This aims to recognize the ball and improve children's ability to master the ball, bounce the ball (dribbling), and train fine motor fingers and arm muscles
17	Dribbling low	The movement of dribbling with the teacher's position is in front of the students. Student holds the ball with both hands on the right and left. The ball in front of the chest legs are opened shoulder-width apart and the knees are bent. Next, the teacher gave instructions to bounce the ball on the floor repeatedly. This aims to recognize the ball and improve children's ability to master the ball, bounce the ball (dribbling), and train fine motor fingers and arm muscles.
18	Dribbling left	The movement of dribbling with the teacher's position is in front of the student, students hold the ball with both hands on the right and left. The position of the ball in front of the chest. Legs are opened shoulder-width apart and knees bent. Next, the teacher gives instructions to bounce the ball to the floor with his right hand repeatedly. This aims to recognize the ball and improve children's ability to master the ball, bounce the ball (dribbling), train fine motor fingers and arm muscles.
19	Dribbling right	The movement of dribbling with the teacher's position is in front of the students. Student holds the ball with both hands on the right and left. The ball in front of the chest legs is opened shoulder-width apart and the knees are bent. Next, the teacher gives instructions to bounce the ball to the floor with his left hand repeatedly. This aims to recognize the ball and improve children's ability to master the ball, bounce the ball (dribbling), train fine motor fingers and arm muscles.
20	Dribbling 1	The movement of dribbling with the teacher's position is in front of the students. Student holds the ball with both hands on the right and left. The ball in front of the chest legs is opened shoulder-width apart and the knees are bent. Next, the teacher gives instructions to push forward for 1-meter and bounce the ball to the floor repeatedly. This aims to recognize the ball and improve children's ability to master the ball, bounce the ball (dribbling), and train fine motor fingers and arm muscles.
21	Dribbling 2	The movement of dribbling with the teacher's position is in front of the students. Student holds the ball with both hands on the right and left. The ball in front of the chest legs are opened shoulder-width apart and the knees are bent. Next, the teacher gave instructions to bounce the ball on the floor repeatedly. Forward 1.5-meters. This aims to recognize the ball and improve children's ability to master the ball, bounce the ball (dribbling), and train fine motor fingers and arm muscles.
22	Dribbling 3	The movement of dribbling with the teacher's position is in front of the students. Student holds the ball with both hands on the right and left. The ball in front of the chest legs are opened shoulder-width apart and the knees are bent. Next, the teacher gave instructions to bounce the ball on the floor repeatedly. Go forward 2 meters away. This aims to recognize the ball and improve children's ability to master the ball, bounce the ball (dribbling), and train fine motor fingers and arm muscles.
23	Dribbling 4	The movement of dribbling with the teacher's position is in front of the students. Student holds the ball with both hands on the right and left. The ball in front of the chest legs are opened shoulder-width apart and the knees are bent. Next, the teacher gave instructions to bounce the ball on the floor repeatedly. Forward 2.5 meters. This aims to recognize the ball and improve children's ability to master the ball, bounce the ball (dribbling), and train fine motor fingers and arm muscles.
24	Dribbling left 1	The movement of dribbling with the teacher's position is in front of the students. Student holds the ball with both hands on the right and left. The ball in front of the chest legs is opened shoulder-width apart and the knees are bent. Next, the teacher gave instructions to bounce the ball on the floor repeatedly. Go right for 1 meter. This aims to recognize the ball and improve

		children's ability to master the ball, bounce the ball (dribbling), and train fine motor fingers and arm muscles.
25	Dribbling left 2	The movement of dribbling with the teacher's position is in front of the students. Student holds the ball with both hands on the right and left. The ball in front of the chest legs is opened shoulder-width apart and the knees are bent. Next, the teacher gave instructions to bounce the ball on the floor repeatedly. Go right for 1.5 meters. This aims to recognize the ball and improve children's ability to master the ball, bounce the ball (dribbling), and train fine motor fingers and arm muscles.
26	Dribbling right 1	The movement of dribbling with the teacher's position is in front of the students. Student holds the ball with both hands on the right and left. The ball in front of the chest legs are opened shoulder-width apart and the knees are bent. Next, the teacher gave instructions to bounce the ball on the floor repeatedly. Go left for 1 meter. This aims to recognize the ball and improve children's ability to master the ball, bounce the ball (dribbling), and train fine motor fingers and arm muscles.
27	Dribbling right 2	The movement of dribbling with the teacher's position is in front of the students. Student holds the ball with both hands on the right and left. The ball is in front of the chest legs are opened shoulder-width apart and the knees are bent. Next, the teacher gave instructions to bounce the ball on the floor repeatedly. Go left for 1.5 meters. This aims to recognize the ball and improve children's ability to master the ball, bounce the ball (dribbling), and train fine motor fingers and arm muscles.
28	Zig zag Dribbling	The movement of dribbling with the position of the teacher is in front of the student. Student holds the ball with both hands on the right and left. The ball in front of the chest legs is opened shoulder-width apart and the knees are bent. Next, the teacher gives instructions to bounce the ball to the floor repeatedly and pass through the cone to the right and left. This aims to recognize the ball and improve children's ability to master the ball, bounce the ball (dribbling), and train fine motor fingers and arm muscles.
29	Shooting touch	The shooting movement with the teacher's position behind the student and giving instructions. Students stand in front facing the basket 1 meter away. The student's legs are opened shoulder-width apart and the knees at the bend of the ball are held with both hands. The teacher holds both students' hands and directs the hands to lift the ball above the head and shoot towards the basket. This aims to recognize the ball and improve children's ability to master the ball and shoot basketball, as well as train fine motor fingers and arm muscles.
30	Shooting left 1	The shooting movement with the position of the teacher is next to the student and gives instructions The student stands on the right facing the basket 1 meter away. The student's legs are opened shoulder-width apart and the knees at the bend of the ball are held with both hands. The teacher holds both students' hands and directs the hands to lift the ball above the head and shoot towards the basket. This aims to recognize the ball and improve children's ability to master the ball and shoot basketball, as well as train fine motor fingers and arm muscles.
31	Shooting left 2	The shooting movement with the position of the teacher is next to the student and gives instructions The student stands on the right facing the basket 1.5 meters away. The student's legs are opened shoulder-width apart and the knees at the bend of the ball are held with both hands. The teacher holds both students' hands and directs the hands to lift the ball above the head and shoot towards the basket. This aims to recognize the ball and improve children's ability to master the ball and shoot basketball, as well as train fine motor fingers and arm muscles.
32	Shooting right 1	Shooting movement with the position of the teacher next to the student and giving instructions. Student standing on the left facing the basket is 1 meter away. The student's legs are opened shoulder-width apart and the knees at the bend of the ball are held with both hands. The teacher holds both of the student's hands and directs the hand to lift the ball above the head, shooting towards the basket. This aims to recognize the ball and improve children's ability to master the ball and shoot basketball, as well as train fine motor fingers and arm muscles.
33	Shooting right 2	Shooting movement with the position of the teacher next to the student and giving instructions. Student standing on the left facing the basket is 1.5 meters away. The student's legs are opened shoulder-width apart and the knees at the bend of the ball are held with both hands. The teacher holds both students' hands and directs the hands to lift the ball above the head and shoot towards the basket. This aims to recognize the ball and improve children's ability to master the ball and shoot basketball, as well as train fine motor fingers and arm muscles.
34	Shooting 1	Shooting movement with the position of the teacher next to the student and giving instructions. Students stand in front facing the basket 0.5 meters away. The student's legs are opened shoulder-width apart and the knees at the bend of the ball are held with both hands. The teacher holds both students' hands and directs the hands to lift the ball above the head and shoot towards the basket. This aims to recognize the ball and improve children's ability to master the ball and shoot basketball, as well as train fine motor fingers and arm muscles.
35	Shooting 2	Shooting movement with the position of the teacher next to the student and giving instructions. Students stand in front facing the basket 1 meter away. The student's legs are opened shoulder-width apart and the knees at the bend of the ball are held with both hands. The teacher holds both students' hands and directs the hands to lift the ball above the head and shoot towards the basket. This aims to recognize the ball and improve children's ability to master the ball and shoot basketball, as well as train fine motor fingers and arm muscles.
36	Shooting 3	Shooting movement with the position of the teacher next to the student and giving instructions. Students stand in front facing the basket 1.5 meters away. The student's legs are opened shoulder-width apart and the knees at the bend of the ball are held with both hands. The teacher holds both students' hands and directs the hands to lift the ball above the head and shoot towards the basket. This aims to recognize the ball and improve children's ability to

		master the ball and shoot basketball, as well as train fine motor fingers and arm muscles.

2. MATERIEL AND METHODS

This research is development research using the research and development (R&D) method and the Borg and Gall model with 10 stages. To further sharpen the direction of research, a preliminary study was carried out, and then correction and evaluation were carried out as shown in figure 1.



This study involved 154 students in 7 extraordinary elementary schools in 3 cities in the West Java province. Autism criteria use the DSM-V with mild to moderate autism [17]. The preliminary study involved 200 respondents who also involved were parents, teachers, and principals. The small group trial involved 20 people in two schools in Purwakarta City. While the large group test was 60 people in 3 extraordinary elementary schools in Subang City. The effectiveness test involved 74 students at the Special Elementary School in Karawang City. Here are table characteristics of research subjects:

Table 2. Respondent criteria

Criteria	Small Trial	Big Trial	Test Effectiveness
Age	10 – 12 = 20 students	10 – 12 = 60	10 – 12 = 74
Gender	Men = 12	Men = 32	Men = 30
	Women = 8	Women = 28	Women = 44

Data collection using several methods; 1) Preliminary studies were conducted to see the problems in the field and analyze the needs of basketball learning models for autistic children; 2) Basketball scoring instruments using instruments from the curriculum; 3) The interview method is used to see the effectiveness of the product; 4) Questionnaires are used to analyze teacher needs and perceptions related to basketball learning models through small group tests, large group tests and effectiveness tests; 5) A series of tests are given to see the success of students in achieving learning targets. Product moment correlation is used to determine the level of validation and reliability of the instrument. The validity score of the basketball learning model for autistic children is known to be 0.847 and when compared with rtable with n = 30 at the level of α = 0.05 obtained a rtable value of 0.361. Thus, the calculation > rtable and it can be stated that the instrument used has a very high or very perfect level of validity. After the validity test was carried out, the instrument reliability test was also carried out through pre-test and post-test correlation coefficients. From the correlation results, it is known that the Cronbach Alpha value is 0.882 > 0.07. It can be stated that the instrument used has a very high level of reliability or a very perfect category.

3. DISCUSSIONS

Based on the data in Table 4, it can be illustrated that the total number of respondents is 74 people divided into two groups, 37 people in the experimental group and 37 people in the control group. The minimum score on the experimental group pretest was 33 and the control group on the pretest was 31. The maximum score for the experimental group was 66 and the control group on the pretest was 62. It was also seen that the minimum score for the experimental group on the posttest was 48 and for the control group was 43. While the maximum score for the experimental group was 85 and for the control group was 72. If we look at the average value of the two groups

both on the pretest and posttest, there is a difference in the experimental group with the average value in the pretest session was 51.86 with a standard deviation of 8,413, and in the control group was 50.03 with a standard deviation of 8.067. The score in the post-test session and the score in the experimental group increased to 70.97 with a standard deviation of 8.102. S in the control group to 57.22 with a standard deviation of 7.326

Tabel 4. The result of the pretest and posttest from the experiment and control group

	Descriptive Statistics						
			Minimum	Maximum	Sum	Mean	Std. Deviation
Experimental Group	Pretest	7	33	66	1919	51.86	8.413
	Posttest	7	48	85	2626	70.97	8.102
Control Group	Pretest	7	31	62	1851	50.03	8.067
	Posttest	7	43	72	2117	57.22	7.326
	Valid N (listwise)	7					

Based on the data in Table 4, it can be illustrated that the total number of respondents is 74 people divided into two groups, namely 37 people in the experimental group and 37 people in the control group. The minimum score on the experimental group pretest was 33 and the control group on the pretest was 31. The maximum score for the experimental group was 66 and the control group on the pretest was 62. It was also seen that the minimum score for the experimental group on the posttest was 48 and for the control group was 43, while the maximum score for the experimental group was 85 and for the control group was 72. If we look at the average value of the two groups both on the pretest and posttest, there is a difference, namely in the experimental group. The average value in the pretest session was 51.86 with a standard deviation of 8,413. The score in the control group was 50.03 with a standard deviation of 8.067 and the score in the post-test session and the score in the experimental group increased to 70.97 with a standard deviation of 8.102. In in the control group was 57.22 with a standard deviation of 7.326

Table 5 presents the t-test results between the experimental and control groups. In the control group, there is a difference in the average value between the pretest and posttest scores of -19,108 with t count = -23,277 with df = 36 and p value or sig score (2-tail) = 0.000 < 0.05. This means that there are differences in basketball test results in the pretest and posttest in the experimental group after being treated in the form of a basketball learning model based on the division of basic basketball movements, namely passing, dribbling, shooting. Thus, the basketball learning model for autistic children is effective and feasible to use to improve basic basketball movement skills.

Table 5. Results of paired Sample T-Test Experiment Group and Control Group

	Paired Samples Test									
			Paired Differences					t	f	Sig. (2-tailed)
			Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
						Lower	pper			
Basketball test	Pair 1	Pretest - Posttest (experimental group)	19.108	4.993	821	-20.773	17.443	-23.277	6	000
	Pair 2	Pretest - Posttest (control group)	7.189	9.095	1.495	-10.222	4.157	-4.808	6	000

From the results of t-test data analysis in the control group, it was found that there was an average difference between pretest and post-test scores of -7.189 with t-scores calculated = -4.808 with df = 36 and p-values or sig scores. (2-tail) = 0.000 < 0.05. This means that there are differences in basketball test results in the pretest and posttest in the control group after being given conventional learning treatment. That is, conventional models can also be used to improve basic basketball movement skills.

CONCLUSIONS

The conclusions of the study above provide recommendations or suggestions: 1) For teachers, it is recommended to provide a gradual and iterative learning model; 2) The school should pay more attention to the learning program plan provided; 3) To the next researcher if continuing this research to look at other variables so that more complete information is obtained on basketball.

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