

Motion Activity through Games toward Students Creative Thinking Skills

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Abstract— This study aims to determine the effect of motion activity through games on students' creative thinking skills. Conceptually, the goals of the Sports and Health Physical Education subjects (PJOK) is not only to develop physical abilities, but also to develop intellectual, mental, social and emotional dimensions. This study was quasi-experimental research by using posttest-only control group design. The population of the study was all eighth grade students in State Junior High School (SMPN) 1 Diwek and State Junior High School (SMPN) 5 Jombang. Random sampling technique was used in this study. The sample of the study were 68. Data collection of this study used students' thinking tests. Data in this study were analyzed by using SPSS 20 in consideration of significance level of 0.05. The results of data analysis showed that the probability value of the learning strategy is higher than 0.05, it was 0.000. Thus the null hypothesis was rejected and the research hypothesis was accepted

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Keywords: motion activity, game, creative thinking skills

I. INTRODUCTION

Conceptually, the goals of the Sports and Health Physical Education subjects (PJOK) is not only to develop physical abilities, but also to develop intellectual, mental, social and emotional dimensions. Rink, & Hall [6], states that through PJOK it brings an impact of meaningful learning experience if the learning process include; (1) the learning experience potentially improving the student's ability to move; (2) the learning experience provides maximum activity or time to practice for all students appropriately to the student's ability level; (3) learning experience is appropriate to the experience level of the students; and (4) the learning experience is potential to integrate educational goals (skills, attitudes, and knowledge). Lynch & Soukup [4] state that PJOK is a key area of learning in a curriculum that focuses explicitly on developing movement skills and knowledge, understanding, skills through physical activities with competence and confidence to encourage the sustainability of students' life and in turn bring health as the goal.

Students have a variety learning methods in accordance with the development and history of learning settings. So that appropriate learning methods are needed in order to make learning objectives be achieved. Silverman [8] states that to master higher movements or skills, students need time and different practice, and it is determined by a teacher in designing the appropriate learning process. Moreover, Silverman & Mercier [9] PJOK teachers play an important role in designing instructional for physical and motoric skills development of students.

PJOK should pay attention on the students' changing and conditions in accordance with "Developmentally Appropriate Practice" (DAP). It means that the task of teacher in delivering the material must pay attention of changing in several things, namely: 1) child development and learning - knowledge of age-related human characteristics that allow general predictions with age ranges about what activities, materials, interactions, or experiences that will be safe, healthy, interesting, achievable, and also challenging for children; 2) the strengths, interests, and needs of each child in the group to be able to adapt and respond to the inevitable individual variations; and 3) the social and cultural context in which children live to ensure that the learning experience is meaningful, relevant, and respects children who participate and also their families [1].

Creative teacher is needed in order to overcome the students' low achievement of the subject. The unavailability of facilities and infrastructure requires teachers to think creatively. In addition, variations in achievement in order to make students active during the learning process. The existence of teachers who are able to optimize the facilities and can make students to learn without being forced, especially when movement activities are needed to achieve the learning objectives. Teachers are needed to be able to modify everything so that the learning process goes well. Modification methods can be taken by reducing or increasing the level of difficulty faced by students both in terms of assistive devices and equipment, material characteristics that are adapted to the circumstances of the students, the learning environment and evaluation method which given at the end of the activity.

Game modification is needed in PJOK learning process. Through the game students will not feel learning but feel playing. So it can be interpreted that when students play games the students are actually learning. The nature of the sports game is designed using an approach to problem solving. Volleyball as an example the main point of the game is about how to hit the ball so that it can pass through the net that stretches in the middle of a field with a certain height. Some of the main rules on the game are made to regulate how to solve "various basic problems". If the main rules are changed, the game will be changed or no longer match the nature of the game. Unlike the case if the change is "secondary" regulations or regulations that are not the main rule. Some secondary regulations that can be modified are: a. Size, weight, material or form of equipment used b. Area or place of play and size of field c. Length of playing time d. Number of players in one team e. Rules for playing f. The size of the goal / basket, net height or obstacle g. Rotation or position of the player h. How to obtain values etc [5], [13].

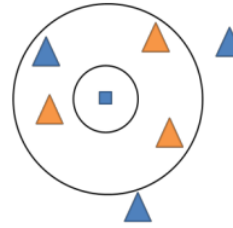
For children, the game functions are: 1) mental value, 2) physical or health value, 3) social value. This mental value includes: a. needs of children of new experiences, b. needs of children of security, c. needs of children to be recognized, d. needs of children to participate. e. needs of children to feel happy. Physical or health value, when moving in playing, of course accompanied by excitement. A happy atmosphere has an influence on the release of hormones that stimulate body growth. Therefore, the delivered PJOK materials are directed to the game so that the atmosphere is encouraging. Social value, children who are playing happily will have a free mental atmosphere or escape obstacles. Unconsciously the value covered so far will appear because of freedom. So that teachers will be easily to know the characteristics of children when playing. In addition, sportivity will encourage a sense of unity, togetherness, responsibility in the group and its members, cooperation, and a sense of prioritizing group needs rather than personal needs [17].

The form of the game in this study is a modification of the big ball game. The game can be modified by considering the things below:

- Fun, the game must be able to please all members or players who play.
- Active, all players must be active.
- Safe, all games must involve fair opportunities
- Skills, the game must contain or require their own skills.
- Equipment, the game must be easily played without complicated equipment need such as needing a computer.
- Time, the game must have a break to rest
- Divided, the game must have a level or part so there is time to practice
- There is referee or not, the game must be simple so that it can be played wheter there is a referee or not.
- Assessment, the game must be simple in assessment so that the player can calculate on their own without help from others.

The form of the game in this study are as follow:

1. Football game



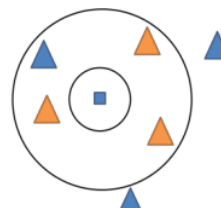
- Information:
- Modified object to be used as goal or target of ball shots
 - ▲ Guard player, so that the ball is not shot at the target or goal
 - ▲ Striker, aiming to shoot the ball at the target

Figure 1. Modified Football Game

Football games can be modified by using rules in accordance to the rules and provisions in modifying the game as the above theory. The game use the following rules:

- Striker is the player holding the ball. And guard players are players who keep the ball from being shot to the target.
- Guard players may not take the ball outside the large field and cannot enter the small circle to prevent it from being attacked.
- The game is won by the team that is most about the target during the match. Keep in mind the striker is not allowed to attack by deliberately in order to injure the guard by shooting the ball directly at the opponent.
- This game can be played 2 times 5 minutes or 10 minutes with a given break.
- This game is played like football. Players pass the ball to their friends and try to shot with various strategies.

2. Basketball game



- Information:
- Modified object to be used as basket
 - ▲ Guard player, so that the ball is not shot at the basket
 - ▲ Striker, aiming to shoot the ball to the basket

Figure 2. Modified Basketball Game

The modified basketball game uses rule as follows:

- The attacking player is the player holding the ball. And guard players are players who keep the ball from being entered into the target area.
- Guard players may not take the ball outside the large field and cannot enter the small circle to prevent it from being fired.
- The game is won by the team that puts the most goals in the game. Keep in mind the attacker is not allowed to attack by deliberately injuring the guard by shooting the ball directly at the opponent.
- This game can be played 2 times 5 minutes or 10 minutes and given a break.
- This game is played like a basketball. Players give feedback to their friends and try to target with various strategies

3. Volleyball game

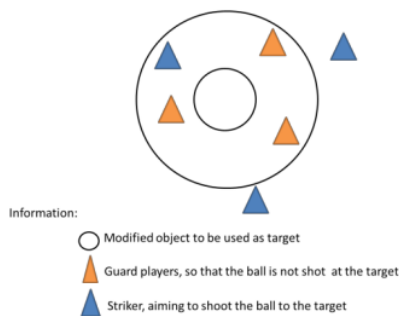


Figure 3. Modified Volleyball Game

Modified volleyball games uses rule as follows:

- The attacking player is the player holding the ball. And the guard player is a player who keeps the ball from being inserted into the basket.
- Guard players may not take the ball outside the large field and cannot enter the small circle to prevent it from being fired.
- The game is won by the team that puts the most goals in the game. Keep in mind the attacker is not allowed to attack by deliberately injuring the guard by shooting the ball directly at the opponent.
- This game can be played 2 times 5 minutes or 10 minutes and given a break.
- This game is played like a volleyball. Players give feedback to their friends and try to target with various strategies

The game above is played by all students by forming their own groups. During the game the teacher walks around to monitors all groups by giving direction to the game and when the game ends, the educator provides an evaluation related to the game. During activity the teacher directs the students to move

correctly in the game. So that every student moves various ways as their efforts in order to win the game.

The game can improve the quality of the learner's movement, and when moving it also bring up values. When moving proportionally, it can activate brain cells to work optimally. The brain itself consists of two parts: the left hemisphere and the right hemisphere. The left brain hemisphere is related to scientific thinking, critical, logical and linear abilities, while the right brain hemisphere is related to non linear, non verbal, holistic, humanistic, and even mystical functions. The birth of creativity in the form of ideas and real work is a combination of the two hemispheres of the brain [17].

Education is very important to create creative students. It can be seen in the Partnership for 21st Century Skills, Education & Competitiveness [10], [11] which shows the need for a generation of flexible and adaptive, initiative and independence, social and cultural skills, productive and accountable as well as leadership and responsibility towards technological development. Furthermore, based on the Tough Choices or the Tough Times National Center on Education and the Economy [12], [14] states that creativity is the main key to success along with the development of a sophisticated era. In the world of work, workers who have a high creative level are needed. This is where PJOK participates in creating or providing stimulation so that the learning process is able to improve higher-order thinking skills, especially creative thinking.

To create students who have creative provision for the future can be started from the existing learning process. Krathwohl [3] states that the highest ability is creative and this is formed by learning various combinations of dimensions of knowledge. The curriculum in the education unit becomes the basis for conditioning the learning process can develop creative thinking for students, critical problem solving, and communication and collaboration. According to Carroll [2], ; Trilling & Fadel [15] stated the need for new transformations and standards for students by replacing basic skills and knowledge competencies from the past. Departing from the things above the researcher, aims to determine the effect of motion activity through the game. Researchers plan to carry out research with the title "Motion activity through games on the creative thinking skills of students".

II. METHOD

This research is a quasi-experimental study by using The Posttest-Only Control Group Design[7] it is a research design consisting of two groups of treatment and control groups. This research design, subjects were randomly placed in groups and exposed as independent variables and given a post test. Post test score are then compared to determine the effectivity of treatment. Sample was randomly assigned on two schools. This research has the assumption of similar grade of VIII and taught PJOK subject. The study population is all eighth grade students in SMP Negeri 1 Diwek and SMP Negeri 5 Jombang. The sampling technique in this study uses random sampling in each class.

This research variable consists of dependent variables, it is the activity of motion through games and conventional given

by the teaching teacher. The dependent variable of this study is the test of students' creative thinking. The population of this study was all eighth grade students of SMP Negeri 1 Diwek. The sample of this study was taken by class random sampling technique based on the sampling technique, it was obtained 68 students. Data collection of this study uses students' thinking tests by using worksheet tests to measure 1) fluency in the use of words in finding certain structural requirements, 2) smooth reorganization of perceptions of a given word, 3) fluency in expression, 4) fluency in giving ideas, 5) flexibility in thinking, 6) ability in developing ideas. The data in this study were analyzed in stages, namely: data descriptions, prerequisite tests, and hypothesis testing. The prerequisite test is to test the data distribution normality, test variance homogeneity, and differences. The calculation of this study uses SPSS 20 and uses a significance level of 0.05.

III. RESULT AND DISSCUSION

The data obtained in this study are then calculated according to the needs of the analysis. This study focuses on differences in creative thinking skills between schools that are treated with comparative or conventional schools. Description of the data presented and grouped aims to find the level of students' creative thinking skills. The experimental group in this study was the SMP N 1 Diwek school while the control group was the SMP N 5 school. The description of the results of this study can be seen in the following table.

TABLE I. THE DIFFERENCES OF CREATIVE THINKING SKILLS IN COMPARATIVE AND CONVENTIONAL SCHOOL

Group	N	Mean	Std. Deviation	Std. Error	Min	Max
Experiment (SMPN 1 Diwek)	34	87.32	5.34	.959	75	96
Control SMPN 5 Jombang	34	72.87	5.26	.946	63	85
Total	68	80.09	8.98	1.141	63	96

Based on the data obtained can be described that the mean of the experimental group was 87.32 and the control group 72.87. The different meanings, of course it can be concluded that the largest average of 87.32 is obtained by the experimental group. While the control group obtained a value of 72.87.

The data obtained needs to be analyzed to test the hypothesis. The Levene's test and the Kolmogorov-Smirnov test were carried out. Levene's test and Kolmogorov-Smirnov test are conducted to find out whether the data is distributed following normal data distribution or not. After this test, the data is tested comparatively. Below is a test for homogeneity and normality

TABLE II. LEVENE'S TEST OF EQUALITY OF ERROR VARIANCES A DEPENDENT VARIABLE

F	df1	df2	Sig.
.098	1	60	.755

The tests results showed that there is null hypothesis that the error variance of the dependent variable is equal across groups.

TABLE III. ONE-SAMPLE KOLMOGOROV-SMIRNOV TEST

		Test Result
N		68
Normal Parameters a,b	Mean	80.0968
	Std. Deviation	8.98397
Most Extreme Differences	Absolute	.111
	Positive	.111
	Negative	-.094
Kolmogorov-Smirnov Z		.876
Asymp. Sig. (2-tailed)		.426

The tests results showed that the distribution of the population is normal.

Based on the table above the data is said to be homogeneously distributed if the significance level is more than 0.05. The significance value of the homogeneity analysis prerequisite test results is 0.755. This result can be concluded that the data is normally distributed and can continue to the next test. While to test the normality of the data is said to be normally distributed if the value of the significance level is more than 0.05. It can be seen from the table that the value of the Normality test is 0.426. So that it can be stated that the results are normal and can proceed to hypothesis testing.

After the prerequisite test is carried out then hypothesis testing is proceed. This hypothesis test is needed to answer the hypothesis whether there are differences or not from the experimental group. Based on the results of different test samples obtained data below.

TABLE IV. HYPOTHESIS TEST RESULTS

	t-test for Equality of Means						
	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
						Lower	Upper
Equal variances assumed	10.73	60	.000	14.45	1.35	11.75	17.15
Equal variances not assumed	10.73	59.98	.000	14.45	1.35	11.75	17.15

In the table above it can be seen that the results of the calculation of the data analysis shows that the probability value

of the learning strategy is more than 0.05 that is equal to 0.000. Thus the null hypothesis is rejected and the research hypothesis is accepted. This means that there is an effect of motion activity through the game on students' creative thinking. This result is also supported by Khushartanti's study which states that through motion learning is one of the principles in brain training [16].

Learning motion using the game will make children get benefit from fun and dynamic things. Good games pay attention to the physical and technical characteristics of skills in team sports, tactics and decision making. Ability is very important in order to win the game [18].

1 IV. CONCLUSION **2**

Based on the data obtained can be described that the mean of the experimental group was 87.32 and the control group 72.87. The results of the calculation of the data analysis shows that the probability value of the learning strategy is more than 0.05 that is equal to 0.000. Thus the null hypothesis is rejected and the research hypothesis is accepted. This means that there is an effect of motion activity through the game on students' creative thinking. Based on the calculation, it can be seen that the activity of motion through the game towards students' creative thinking is a significant difference. The learning process it can be suggested that to stimulate students to think creatively can use the game or contain fun and dynamic activities. The process during learning should contain (1) learning experience, so that it can improve the students' ability to move; (2) availability of time or opportunity to increase maximum activity appropriately; (3) there is a level of all students; and (4) learning experience has the potential to integrate educational goals (skills, attitudes, and knowledge).

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