

The Traditional Games As A Means of Learning Resources Two Dimensional Figures In Primary School

Desi Setiyadi¹, Zaenuri², Mulyono², Nur Karomah Dwidayati²

¹Primary of Education, Graduate School, Universitas Negeri Semarang, Indonesia

²Department of Mathematics Education, FMIPA, Universitas Negeri Semarang, Indonesia

Corresponding email: desisetiyadi12@gmail.com

Abstract

The purpose of this research was to explore the traditional games as a means of learning resource two dimensional figures materials in primary school. The research was conducted in the area of Banyumas by observing a wide variety of traditional games that have relevance to mathematical concepts. The research method applied was survey method. The data collection technique was done through observation, literature review, and documentation. The results showed that Banyumas various traditional games such as *engklek* (hopscotch), *dam-daman* (checker), *gobak sodor* and *bandaran* is related to etnomatematics learning, which is the concept of two dimensional figure.

Keywords : Culture, Traditional Games, Two Dimensional Figures

1. Introduction

Globalization has affected a shift in the value of life embraced by the citizens of the nation (Fauzi, 2016). The need for awareness of Indonesian life to be able to filter the culture of Western culture must be done, so that a genuine culture of Eastern nations, especially Indonesia is not lost and can co-exist with the times. Traditional games in various remote areas of Indonesia has considered to be endangered culture in Indonesia. One of the example is the traditional games in the area Banyumas Regency, Central Java, Indonesia.

Kusnandar & Nurcahyo (2017) states that traditional games as the nation cultural assets to be preserved, explored and cultivated over the times. In addition, traditional games can be used as a learning resource for students, especially math. The design of the arena, tools and materials in traditional games can be used as a means of learning for students to introduce themselves with the concept dimensional figures of math in primary school.

Hiebert and Carpenter (1992) revealed that the teaching of mathematics in schools and student mathematics are found in everyday life will be very different. Therefore, the traditional game is a bridge between mathematics with students daily lives, so that learning was impressed play while learning. Hudojo (1998) stated that learning while playing is a learning theory of Dienes in which there are six stages, one of which is a game that uses the rules.

Basic education, particularly in primary school consist of geometric figures material. The examples of geometric figures are square,

rectangular, triangular, trapezoid, parallelogram, rhombus, kite and circles. It is stated in the syllabus of mathematics of Curriculum 2013 in primary school in the subject matter of geometry and measurement.

The mathematical concept dimensional figures can be obtained by students in the traditional games, since mathematics is derived from the culture. This is in accordance with Raymond (Gie, 1999) who states that it can not be denied that mathematics is one of the most important part of the culture in every modern society. Mathematics originating from the culture often called etnomatematics. It is a mathematical grow and develop in a particular culture (Joseph, 2010).

Based on observations conducted in Banyumas, there were a wide variety of traditional games such as *engklek* (hopscotch), *dam-daman* (checker), *gobak Sodor*, and *bandaran*. The results of the research conducted by Setiyadi, Zaenuri & Mulyono (2018) states that the learning process of etnomatematics with traditional games can make students more interested in the course.

2. Method

This research applied research methods *survey*. The research was conducted in the area of Banyumas Regency, Central Java, Indonesia. The location and the subject of the study was conducted by using purposive sampling. The steps of survey method conducted in this study were as follows, 1) study of literature, 2) data collection in the field, 3) description, and 4) an

analysis of findings from the field (factual model).

To conclude, the activities carried out consisted of several activities, as follows, 1) explored the traditional games culture in the area Banyumas, 2) analyzing the relationship of traditional games with the concept two dimensional figures as a means of mathematics learning resources in primary school. The data collection technique was done by using observation, literature review, and documentation. The analysis of the data used in this study was descriptive qualitative.

3. Results and Discussion

The research which was carried out have been successful in exploring the traditional games culture in the area of Banyumas Regency, Central Java, Indonesia such as *engklek* (hopscotch), *dam-daman* (checker), *gobak Sodor*, and *bandaran*.

3.1 Engklek Game (Hopscotch)

Engklek is a traditional games of jump by throwing *gacuk* on a flat plane that is drawn on the ground with several shapes, they are a square, rectangle, triangle and circle and played by minimum 2 players. The arena and *gacuk* of *engklek* can be seen in Figure 1.



Figure 1. The Arena and *Gacuk* of *Engklek*

The rules of *engklek* are as follows: 1) the players determine who plays at first by whistling or *hong ping pah*, the winning player will play at first, and the losers shall wait to take turn to play, 2) the player throwing the *gacuk* to

the area closest to the player, as shown in Figure 1 *gacuk* thrown at number 1, 3) players jumping on one leg (*dengklek*) in the area of the square and the triangle, and use two feet in the areas of rectangular in shape, as shown in Figure 2, 4) the player must pass through all the regions in the arena, 5) the player throwing *gacuk* a way to reverse the body, if *gacuk* fell on one of the arena, then the players get the area as the player paddy 6) players can stand as it passes through the fields using two legs in the game, 7) usually the fields marked by the player with star image.



Figure 2. The Position Players in The Region of Square and Rectangle

As can be seen in Figure 1, it can be identified that the playground of *engklek* are in the form of square, rectangular, and triangular. The length and width of a *engklek* has no standard, but usually the length of a square side is 60 cm. The size of the rectangle with a length of 120 cm and a width of 60 cm and the size of the equilateral triangle of 60 cm and the diameter of the circle of *gacuk* is a 5 cm long.

Those, it can be used by teachers in implementing the concept of geometry and circumference area such as square, rectangle, triangle, and circle. Alternatives to seek circumference and geometry area by measuring the arena game or playground with yarn and a wooden ruler, and pieces of square shaped cardboard.

3.2 Dam-Daman Game (Checkers)

Prastika & Sukadi (2015) states that checkers is a games of defense and attack types

such as chess. The game is a line formed in such a manner and stone or tile with two different groups. Two players take turns attacking each other to devour his troops and also survive.

Players who manage to eat all the opposing forces or pawn will be the winner. The pawns are made of gravel and broken roof tiles. The arena and the pieces of pawns of *dam-daman* (checker) can be seen in Figure 3.

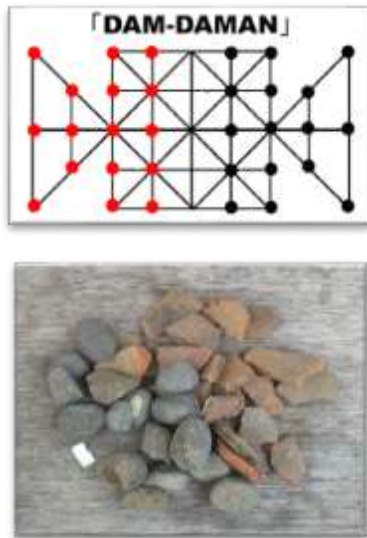


Figure 3. The Arena and Pawns of *Dam-Daman*

The game is played on a board or cardboard that has been drawn. In this game, there are 16 pieces of pawns for each player. The purpose of the game is to spend a pawn of the opponent with the rules that have been agreed as the end of game. The following Figure 4 is the rules for spending a pawn in the game of *dam-daman*.

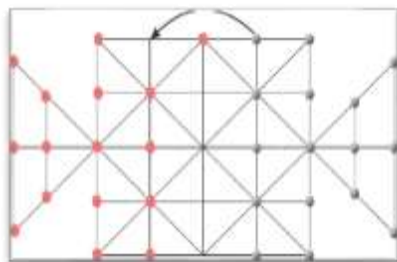


Figure 4. The Rules for Spending Pawns of Opponent

Febriyanto (2015) suggests the steps of *dam-daman* as follows: 1) The player consist of two players, 2) players shall looking for pebbles

and peices of tile to become the pawn, 3) the number of pieces of pawns for each player are 16 pieces, 4) the image of arena of the games is as shown on Figure 3, 5) stacking each piece on the playing area as shown in Figure 3, 6) pawns can only move one step to the side, or forward or diagonally, 7) spend the pawn of opponent by crossing pawn opponent, like Figure 4, 8) do whistling or *suit* to determine the first turn to play, 9) if a player forgot to spend the pawn, then it considered a *dam*, and the opponent is entitled to take the pieces belonging to the opponent as much as three pieces and resume the game, 10) the game ends when one player had run out of pawn.

Based on Figure 3 and 4 the arena of *dam-daman* consists of a large square and two isosceles triangles. Large square made up of a small square, amounting to 16 pieces. The size of the square and the side is tailored to the individual wishes. Generally, the size of the square is small, 6 cm x 6 cm, and an isosceles triangle have a base of 18 cm and 12 cm high. This means that the arena game of *dam-daman* have integrated the concept of geometry of square and isosceles triangle.

3.3 Gobak Sodor Game

Gobak sodor or *blodoran* in Banyumas language is a game that has two groups, they are the group of *gobak sodor* and the group of doorman or gatekeeper. Players must constitute at least 10 people consisting of 5 players and 5 doorman. The name of groups of doorman in *gobak sodor* can be seen in Table 1.

Table 1. Door Guard Name *Gobak Sodor*

Doorman	Nick name
1	<i>Masang Siji or Blodor</i>
2	<i>Masang Loro</i>
3	<i>Masang Telu</i>
4	<i>Masang Papat</i>
5	<i>Masang Lima</i>

The location of the game is in a vast land like field. The border line of the arena is marked with the line written with finely ground limestone or wood ashes. The length of the arena of the game for every door that is 4 meters long and 3 meters wide. The arena of *gobak sodor* game can be seen in Figure 5.

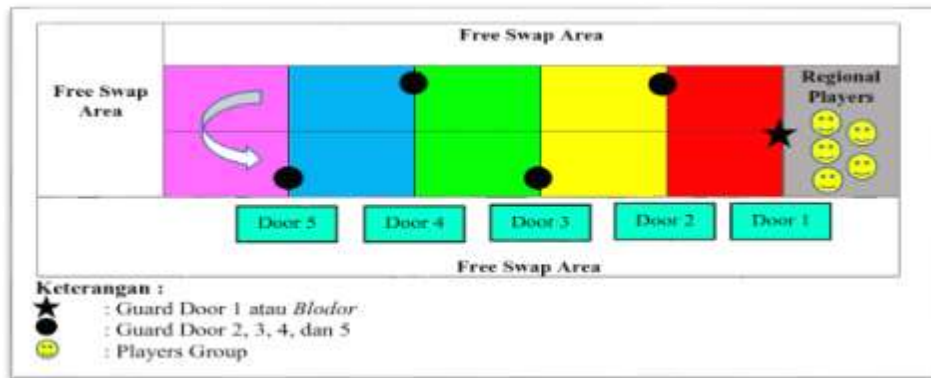


Figure 5. The Arena of Gobak Sodor

The steps of *gobak sodor* is as follows, 1) the chairman of the group *suit* for determining of which group to take turn to play at first, second) the group of guards or gatekeeper occupied every door, while the players are in the players area, 3) each player began to enter the door carefully, 4) gatekeeper can turn off or kill the player by touching the body of any player or players enter the free swap area, 5) the player is declared victorious if all players can skip all of the door guarded and return to the players area safely, 6) the player who won the prize shall be picked up by any guards at a distance of five meters.

Based on Figure 5, it can be identified that the arena of *gobak sodor* game consists of a rectangular geometry. It can be used as an alternative by teachers in presenting the material of circumference and area of a rectangle, students can play *gobak sodor* and studying the

geometry. Students can measure the arena of the game with a ruler or tape measure big rollers.

3.4 Bandaran Game

Bandaran game is a kind of game that consists of a group of players and a keeper (*bandar*). This game uses a rubber band which is rolled up and then thrown to the arena of *bandaran*. If the rubber being thrown into the arena, then the *bandar* must provide a rubber band in accordance with the amount that goes into *bandaran* area. However, if the rubber band falls outside the arena or on the exact *bandaran* arena, rubber bands players belong to the *bandar*.

The number of players on the game of *bandaran* is at least six players consisting of a *bandar*, and five players. A *bandar* should have a number of rubber bands that quite a lot. The *bandaran* game arena can be seen in the following Figure 6.

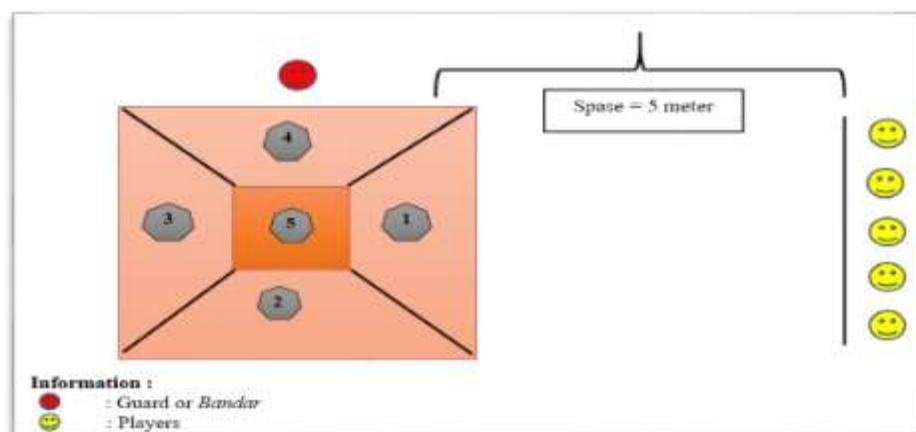


Figure 6. The Arena of Bandaran Game

Based on Figure 6, it can be identified that *bandaran* game arena consists of a large square of geometry, a small square, and four

trapezoidal. It can be used as an alternative by teachers in presenting the material of circumference and area of the square, and

trapezoidal. Students were invited to play *bandaran*, while they practicing to count by using a rubber band, and calculate concept of the circumference and area of geometry on a square and a trapezoid.

4. Conclusion

Based on the results and the above discussion, Banyumas Regency, Central Java, Indonesia various games such as *engklek* (hopscotch), *dam-daman* (checker), *gobak Sodor*, and *bandaran* have a relationship with etnomatematics which is the concept of geometry, such as rectangular, trapezoid, triangle, and circle. It can be used by students as a means of learning resources two dimensional figures in primary school.

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