



MOTIF TIRTAYASA, KEPANDEAN AND KAWANGSAN ON BANTEN BATIK IN MATHEMATICAL THEORY

Selda Setianti¹, Lia Gatra Hanafiani², Vina Devianti³, Sri Wahyuni⁴, Jaka Wijaya Kusuma⁵, Faisal Khan⁶

^{1,2,3,4,5}Bina Bangsa University, Indonesia

⁶Tianjin University of Technology and Education, China

Corresponden Author: jakawijayak@gmail.com

Abstract

Ethnomathematics was first described by D'Ambrosio (1984), who claims to be all the phenomena that shape cultural identities such as language, dialect, beliefs, values, clothing, customs, and behaviours related to various mathematical concepts. It is done. Indonesia is a country rich in culture. One of them is Batik Banten which is a cultural heritage. On October 2, 2009, UNESCO designated Batik as a cultural heritage belonging to Indonesia. Uki Kurniawan founded the Banten Batik Industry and Training Center on December 26, 2004, and was inaugurated on February 8, 2005, by the Minister of Industry. The Banten batik centre now has more than 75 varieties and motifs of Banten batik. This study will examine the Tirtayasa, Kepandean, and Kawangsan motifs. The research method used is descriptive qualitative research with an ethnographic approach, describing philosophical values and studying mathematical concepts. The concepts contained are flat shapes, transformations, similarity and congruence, and number patterns.

Keywords: Ethnomathematics; Philosophical Values and Mathematical Concepts; Tirtayasa; Kepandean and Kawangsan motifs

INTRODUCTION

Mathematics is the queen of the sciences because the development of mathematics does not depend on other sciences, but many other sciences develop from the basic concepts of mathematical science. Mathematics is not only formally taught in school. Indirectly, counting, measuring, and many other community activities related to mathematics. Community activities form a habit called the culture of a group of people. The relationship between culture and mathematics is called ethnomathematics.

The definition of ethnomathematics was first expressed by D'Ambrosio (1984) as follows: "Ethnomatematics is a mathematical method (counting, measuring, associating, classifying, and guessing) for different cultural groups." According to him, the word ethnicity means all the phenomena that make up cultural identities, such as language, dialect, beliefs, values, clothing, food, customs, and behaviour. When it comes to mathematics covers various mathematical concepts such as calculation, measurement, ordering, classification, and decision making. Therefore, ethnomathematics is the application of mathematical concepts by a group of people of different cultures. Ethnomathematics is defined as follows: Mathematics is practised among identified cultural groups such as ethnic communities, labour groups, children

of specific age groups, and the professional class (D'Ambrosio, 1985). From this definition, ethnomathematics has a broad meaning as ethnology (ethnology) and as mathematics and anthropology of mathematical culture and mathematics education.

Indonesia is a country rich in culture. Each region has its cultural uniqueness, one of which is in the Banten area. Banten has many cultures, including food, traditional games, traditional houses, clothing, performances, relics, crafts, etc. One of the famous cultures in the Banten area is Batik. Not only in the Banten area, but Batik is also internationally famous. On October 2, 2009, UNESCO designated Batik as a cultural heritage that Indonesia should be proud of. Therefore, October 2nd is designated as National Batik Day.

Banten Batik was introduced to the public on November 4, 2004. Uki Kurniawan established the Banten Batik Industrial and Training Center on December 26, 2004, and was inaugurated by the Minister of Industry on February 8, 2005. Banten batik centre now has more than 75 varieties and motifs of Banten batik. In this research, we will study the motives of Tirtayasa, Kepandean, and Kawangsan in concepts related to mathematics.

METHODS

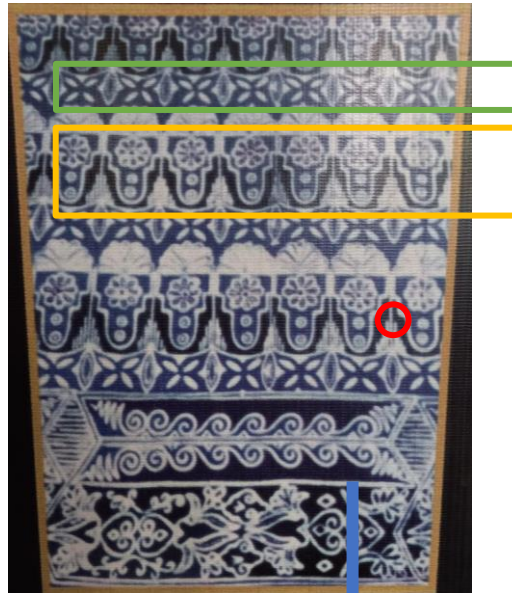
This research began on November 20, 2021, using a descriptive-qualitative research method with an ethnographic approach. According to Cresswell (2008), the Qualitative research method is an approach or research to explore and understand a central phenomenon. Bungie (2011: 68) explained that qualitative descriptive research is explorative research that plays a vital role in forming hypotheses or people's understanding of different social variables. Ethnographic approaches can describe all aspects of culture, such as verbal and nonverbal behaviour patterns, interactions between individuals, cultural experiences, belief value systems, and tools or artefacts used in everyday life, including clothing patterns, buildings, and various complementary media. In this study, ethnographic approaches were used to describe and explain philosophical values and study mathematical concepts in the form of Batik Tirtayasa, Kepandean, and Kawangsan.

RESULT AND DISCUSSION

The results of this study are in the form of explaining philosophical values and studying mathematical concepts in Tirtayasa, Kepandean, and Kawangsan batik motifs. The mathematical concepts are flat building, transformation, revival and partnership, and number patterns.

Philosophical Values And Mathematical Concepts Motif Tirtayasa

Tirtayasa motif is taken from the name of the water management place in the Banten Sultanate.



The mathematical value in the Tirtayasa motif is seen as a flat wake in the form of rhombus and circles. On the red circle, it looks to form an angle of 90° and the concept of reflection (mirroring); the image is reflected so that the images have the same motif (on the blue line). As well as having the concept of revival and harmony in each image. There is a repeating pattern of images (on yellow and green lines).

Philosophical Values And Mathematical Concepts Of Forwarding Motives

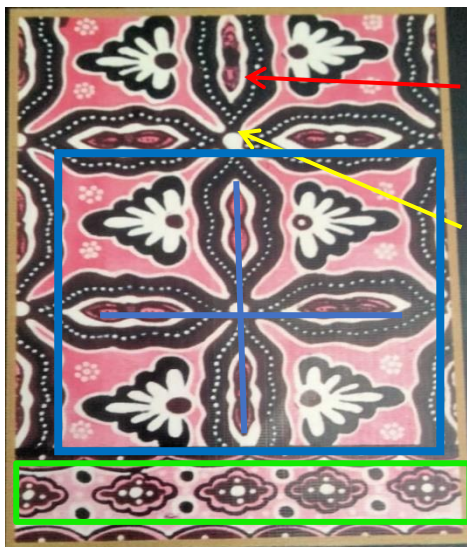
The Kepandean motif is taken from the name of the spatial layout where the village of iron pande craftsmen in the Banten sultanate environment.



The mathematical concept contained in the bold motif is that there is a repeating image pattern (on the green line), on the red line, there is a flat wake that is a triangle, and on the white line, there is a flat wake in the form of a combination of a rectangle and a triangle. On the orange-coloured, circles are seen forming an angle of 90° . And on the yellow line, there is the concept of reflection (mirroring), where the image is reflected so that the top and bottom images have the same motif and have the concept of revival and harmony in each image.

Philosophical Values And Mathematical Concepts Kawangsan Motif

Kawasan motif is the name of the title given to Prince Wangsa in the spread of Islam.



The mathematical values contained in the Kawangsan motif are seen in the presence of rectangles and circles (on the red and yellow arrows). And there is a concept of revival and

partnership in every picture. There is a repeating pattern of images (on the green line). On the blue line, there are shapes such as curves x and y .

CONCLUSION

Based on the discussion results, it can be concluded that Banten batik is the cultural heritage of the Banten area. Bant, Tirtayasa, Kepandean, and Kawangsan studied in Banten batik motifs have philosophical values and mathematical concepts contained are flat wake, transformation, revival and partnership, number patterns, and x and y curves. Of the three motifs we researched, it is expected to be the following research material to explore further the philosophy contained and mathematical concepts in Banten batik motifs Tirtayasa, Kepandean, and Kawangsan.

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