Jurnal Axioma: Jurnal Matematika dan Pembelajaran
Volume 8 No 2 Juli 2023
E ISSN 2615-0697 dan P ISSN 2622-8149
168 – 185

Pamekasan's Ghetak Mask Dance Movement in Ethnomathematics

Gerak Tari Topeng *Ghetak* Pamekasan dalam Etnomatematika

Yeyen Dwi Septiani[1], Moh Zayyadi[2]
zayyadi@unira.ac.id
Universitas Madura

Abstrak

Etnomatematika merupakan hal yang mampu menghubungkan antara budaya dan matematika, yang artinya dari suatu budaya diperoleh langkah untuk menggali kemampuan berpikir yang mampu menghasilkan berbagai bentuk matematika. Kajian mengenai etnomatematika bisa dijadikan sumber belajar bagi siswa untuk mempermudah dalam belajar matematika. Tujuan dari pembelajaran berbasis etnomatematika adalah untuk memahami hubungan antara matematika dan budaya yang mampu membuat kesan siswa dan masyarakat terhadap matematika menjadi lebih bermakna. Penelitian ini bertujuan untuk mengetahui etnomatematika yang ada pada gerak tari Topeng *Ghetak* Pamekasan. Penelitian ini merupakan penelitian deskriptif kualitatif dengan pendekatan etnografi. Pada penelitian kualitatif, data yang didapat oleh peneliti dituangkan dalam bentuk teks yang bersifat naratif untuk mendeskripsikan dan menghasilkan gambaran yang jelas dan terperinci. Melalui hasil penelitian ini diperoleh deskripsi mengenai etnomatematika gerak tari topeng *Ghetak* Pamekasan dalam konsep matematika geometri sudut. Hasil penelitian ini berupa pemaparan konsep matematika yang terdapat pada gerak tari Topeng *Ghetak* Pamekasan yang meliputi konsep: sudut lancip, sudut tumpul dan sudut berpelurus
Kata kunci: etnomatematika; gerak tari Topeng *Ghetak* Pamekasan

Abstract

Ethnomathematics is one thing that is able to connect culture and mathematics, which means that from a culture are obtained steps to explore thinking skills that are capable of producing various forms of mathematics. The study of ethnomathematics can be used as a learning resource for students to make it easier to learn mathematics. The aim of ethnomathematics-based learning is to understand the relationship between mathematics and culture which is able to make students' and society's impressions of mathematics more meaningful. This study aims to determine the ethnomathematics in the dance movements of the Ghetak Pamekasan Mask dance. This research is a qualitative descriptive study with an ethnographic approach. In qualitative research, the data obtained by the researcher is presented in the form of narrative text to describe and produce a clear and detailed picture. The results of this study obtained a description of the ethnomathematics of the Ghetak Pamekasan mask dance movements in the mathematical concept of geometric angles. The results of this study are the mathematical concepts contained in the Ghetak Pamekasan Mask dance movements, namely angular geometry including concepts of: acute angles, obtuse angles, and straight angles.
Keywords: *ethnomathematics; Ghetak Pamekasan Mask dance movement*

INTRODUCTION

Mathematics is a science that studies shapes, quantities, and concepts that are definitely related to one another. Because of this connection, mathematics is not standing alone, but it is also related to various other

disciplines, one of which is culture. Such as the results of studies that focus on school mathematics learning and the influence of cultural factors on mathematics learning (Hafsi & Hasanah, 2018; Zayyadi, 2017). Furthermore, the relevance of mathematics in various aspects of life must understand the nature of mathematics which is used as a tool to solve a problem because mathematics is relevant ideas, facts, concepts, and skills acquired as a result of cultural context (Abi, 2017; Zayyadi et al., 2018).

Mathematics and culture are two things that are closely related to the lives of people who are involved in everyday life (Abi, 2017; Firdaus & Hodiyanto, 2019; Sari et al., 2021). Unknowingly, someone possibly has applied various mathematical concepts in custom and culture in society. Mathematics is a form of culture that has been integrated into all aspects of people's lives (Dhofir et al., 2019; Rachmawati, 2012). Therefore, sometimes a person's mathematical abilities appear because they are influenced by culture, what they do in understanding mathematics based on what they see and feel in everyday life. However, in reality, many people do not realize that they have used various mathematical concepts in everyday life, many people think that mathematics is only useful for learning materials in schools and anything related to mathematics is difficult and frightening, so that it makes they do not realize that mathematics is very useful in life. From the cases above, it is necessary to have ethnomathematics (mathematics in culture). Surrounding objects can be used as ethnomathematics objects, such as the shape of traditional houses, dance movement patterns, traditional musical instruments and traditional cloth motifs (Hafsi & Hasanah, 2018; Prabawati, 2016; Putri, 2017; Rachmawati, 2012).

Ethnomatematics is a study that focuses on the relationship between mathematics and culture (Aini et al., 2019; Andriyani & Kuntarto, 2017; Sari et al., 2021). Ethnomatematics was first introduced by a mathematician from Brazil named Ubiratan D'Ambrosio in 1997. Ethnomatematics comes from the words ethno, mathema and tics. The word ethno is defined as something very broad related to social culture. While the word mathema means explaining, knowing, understanding and carrying out activities such as coding, measuring, classifying, concluding and modeling. Lastly, the word tics means technique. So it can be concluded that the meaning of ethnomathematics in language is defined as an anthropology of mathematics culture and mathematics education. Things learned in ethnomathematics include symbols, concepts, principles and mathematical abilities that exist in national, ethnic or other groups of people related to various mathematical activities such as counting, measuring, explaining and so on (Powell, 2002; Rosa & Orey, 2011; Shirley, 2015).

Ethnomatematics is one of the things that can connect culture and mathematics (Putri, 2017; Zayyadi & Halim, 2020). A culture takes steps to

explore thinking skills capable of producing various forms of mathematics. This means that mathematical concepts can be found from a culture so that they can be used as a real source of learning and are around students. With the application of ethnomathematics in learning mathematics, it is expected that students can easily understand mathematical concepts related to culture. In addition, teachers can also easily instill cultural values in students. One area that is famous for its culture and local wisdom is Madura Island. One of the local wisdoms, especially in Pamekasan, is the Gettak Mask Dance. The Gettak mask dance is a typical Pamekasan dance that was born from the performing arts of ludruk sandur and continues to develop into a modern dance as it is often performed in celebrations at Pamekasan.

The paradigm of mathematics as the ability to think and tools tends to use linear thinking related to theorems and formulas alone. It causes many people think that mathematics is an exact science and difficult to learn, but if mathematics itself is integrated into something soft skills hence thought be more flexible. This can be proven by seeing the existence of beautiful forms of historical buildings such as temples, artifacts, inscriptions and other historical buildings which unconsciously contain mathematical elements. Just as historic buildings are inseparable from mathematical elements, buildings are also designed in such a way that they use aesthetics not only from the aspect of three-dimensional geometric shapes. There are many various Indonesian cultural products that show elements of creativity in mathematics (Andari et al., 2022; Hardiarti, 2017; Hutauruk, 2020).

The aim of ethnomathematics-based learning is to understand the relationship between mathematics and culture which is able to make students' and society's impression of mathematics more meaningful. In addition, the application of mathematics in the real life of students and society, especially in the form of local customs and culture can generate benefits in learning mathematics.

Pamekasan Regency is a residency of Madura Island which is very rich in high-value culture, both in terms of customs, which really reflects the diverse local wisdom of Pamekasan, such as traditional dances, special food, special traditions and many special rituals at certain moments and many more. The typical dance of Pamekasan Regency is the Ghetak Mask Dance. The Ghetak Mask Dance is also called the Klonoan Dance (Pasya et al., 2021). This dance was created in the 17th century. This dance is a manifestation or imitation of one of the well-known figures in the presentation of Dalang Mask art, namely the character Prabu Baladewa. However, another opinion states that the Ghetak/Klonoan Mask Dance depicts a wandering warrior. This is in accordance with the name of the dance, namely Klonoan Dance (kelana).

Jurnal Axioma: Jurnal Matematika dan Pembelajaran
Volume 8 No 2 Juli 2023
E ISSN 2615-0697 dan P ISSN 2622-8149
168 – 185

The study of ethnomathematics can be used as a learning resource for students to make it easier to learn mathematics. Most students think learning mathematics is difficult to understand. Therefore, it is necessary to carry out research related to ethnomathematics to support knowledge of mathematics and culture. For this reason, researchers conducted research with the title "Pamekasan's Ghetak Mask Dance Movement in Ethnomathematics".

METHOD

This research is a qualitative descriptive study with an ethnographic approach. The results of this study obtained a description of the ethnomathematics of the Ghetak Pamekasan mask dance movements in the mathematical concept of angular geometry. This research was conducted by LKP Sanggar Madu Sekar Jl. Masjid Bagandan No. 206, Juncancang, Kec. Pamekasan, Kab. Pamekasan. The time for carrying out this research was from June 9, 2022 to June 14, 2022. The selection of informants in this study used Criterion Sampling, which is a technique for selecting informants according to the criteria set by the researcher. This research requires research subjects or dancers who will analyze their dance movements and an expert who understands the Ghetak Pamekasan Mask Dance. Data collection techniques with research instruments in the form of interview guidelines and observation grids. The data analysis technique used in this study refers to the stages of qualitative data analysis, namely data reduction, data presentation and drawing conclusions. This study uses source triangulation to test the validity of the data obtained. Research design conducted by researchers, namely: preliminary stage, planning stage, implementation stage, and data analysis stage. The research design was carried out as shown in the figure.

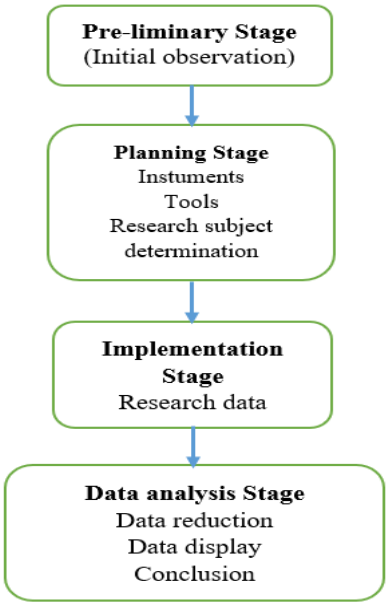


Figure 1. Research Design

Jurnal Axioma: Jurnal Matematika dan Pembelajaran
Volume 8 No 2 Juli 2023
E ISSN 2615-0697 dan P ISSN 2622-8149
168 – 185

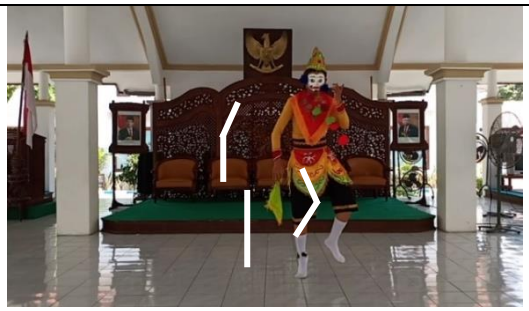
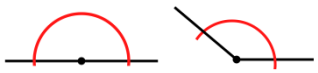
RESULTS AND DISCUSSION

The research results obtained by researchers during the research process were in the form of recorded interviews, pictures of observations, and documentation. To achieve the research objective with the title " Pamekasan's Ghetak Mask Dance Movement in Ethnomathematics", the researcher collected data through interviews with an expert who understands the movements of the Pamekasan Ghetak Mask dance named Mr. H. Suparto. The results of observations from the activities carried out regarding the Ethnomathematics in the Movement of the Pamekasan Ghetak Mask Dance found some data in the form of photos of the Ghetak Mask dance movements to facilitate the ethnomathematics analysis contained therein.

Almost the entire Getak Mask Dance has stomping feet and *mendhak*. It has two connecting motions called *singget*, namely *kojâran pandha'*, *kojâran pandha'* followed by *trècèt* then turning the body to the right, and *kojâran nontong*. In addition to the three *singgets*, the Getak Mask Dance is divided into four different parts, namely varieties A, B, C, D, and every change of motion and variety of movements is always followed by a *singget*. Variety of activities A consists of *nyèrèk, meccè' topèng, penthângan nyorot, tolèân tello', ngoncèr kacèr, ngoncèr kangan-kacèr.* Variety B consists of *ngaca sogâk, ngaca lonca' kangankacèr, gidek bengkong, nyotok, jeglong, sembhâ manjheng*. Variety C consists of *branyak, lembay kangan-kacèr* (*gâgâ'*), *ngaca nyorot, lènggang, kojèran pajuwân, lawung, meccè' topèng*. Variety D consists of dari *penthângan nyorot, lèmbay gâgâ', lèmbay gejjug, gejjugân, nèngkong gejjug, keddhu' maju, keddhu' nyorot*.

Based on several explanations regarding the variations of movement in the Ghetak Mask Dance and the *following* is table 1 which will explain the ethnomathematics in each movement of the Ghetak Mask Dance based on the mathematical concept of discussing angles.

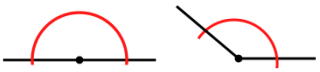
Table 1 Ethnomathematics Analysis of Ghetak Mask Dance Movement Based on the Mathematical Concepts of Angle Geometry

Ghetak Mask Dance Movement	Mathematics Concept
 Figure 1 *Singget* Movement In this movement, the dancers make a tiptoe movement on their right leg and raise their left leg.	 The picture on the left shows that the position of the dancer's right hand and left foot forms an angle of 90°< x <180° which is an obtuse angle, on the dancer's right leg it forms an angle of 180° which is a straight angle.

Jurnal Axioma: Jurnal Matematika dan Pembelajaran
Volume 8 No 2 Juli 2023
E ISSN 2615-0697 dan P ISSN 2622-8149
168 – 185

Figure 2 *Nyèrèk* and *Ukel* Movements

In this movement, the dancers move their feet like walking sideways and little by little and twirling the cloth in their hands.



The picture below shows that the position of the right hand forms an angle of 180° which is a straight angle and the dancer's left forms an angle of 90°< x <180° which is an obtuse angle.

Picture 3 *Meccè'* Mask *Addhep Ka Budih*

In this movement, the dancers move their arms around as if they are fixing a mask and facing backwards.

The picture beside shows that the position of the dancer's right hand, right and left legs of the dancer forms an angle of 90°< x <180° which is an obtuse angle.

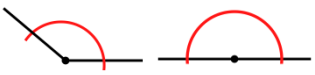
Figure 4 *Tolèân Tello'* Movement

In this movement the dancers turn 3 times sharply to the left, right and left again.

The picture on the left shows that the position of the dancer's right hand, right and left legs of the dancer forms an angle of 90°< x <180° which is an obtuse angle.

Figure 5 The *Ngoncèr Kacèr* Movement

In this movement, the dancer holds the tassel on the headdress with his left hand and his right hand that holds the hips with his legs astride,

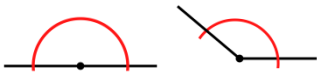


The picture shows that the position, the left hand forms an angle of 180° which is a straight angle, the right hand, right and left legs of the dancer form an angle of 90°< x <180° which is an obtuse angle.

Jurnal Axioma: Jurnal Matematika dan Pembelajaran
Volume 8 No 2 Juli 2023
E ISSN 2615-0697 dan P ISSN 2622-8149
168 – 185

Figure 6 The *Ngoncèr Kangan-Kacèr* Movement

In this movement, the dancers hold the tassel on the headdress with their right and left hands with their feet astride.

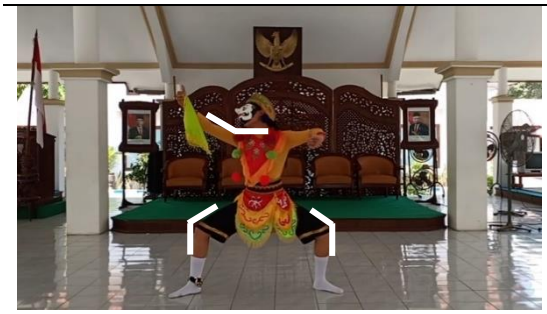


The picture shows that the position of the dancer's right hand to the left hand of the dancer forms an angle of 180° which is a straight angle, the dancer's right and left legs form an angle of 90°< x <180° which is an obtuse angle.

Figure 7 The Ngaca *Gâgâ'* Movement

In this movement, the dancer raises his right hand up with his face that is also looking at the palm of his right hand as if he is looking in a mirror and his left hand is bent facing forward with his feet astride.

The picture shows that the position of the right hand, right and left feet of the dancer forms an angle of 90°< x <180° which is an obtuse angle.



Gambar 8 *Ngaca Lonca' Kangan-Kacèr*

Figure 9 The *Ngaca Lonca' Kangan-Kacèr* Movement

In this movement, the dancer raises one hand up with a face that also looks at the palm of the hand as if he is looking in a mirror and the other hand is bent facing forward with the leg astride and jumping up and down when changing the direction

The picture beside shows that the position of the right hand, left hand, right and left leg of the dancer forms an angle of 90°< x <180° which is an obtuse angle.

Jurnal Axioma: Jurnal Matematika dan Pembelajaran
Volume 8 No 2 Juli 2023
E ISSN 2615-0697 dan P ISSN 2622-8149
168 – 185

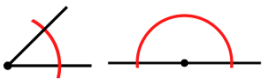
of movement to the right and left

Figure 10 Movement of *Gidek Bengkong*

In this movement, the dancer holds his right and left hips with his legs astride while shaking his hips to the right and left.

The picture shows that the position of the dancer's right and left hands, the dancer's right and left legs form an angle of 90°< x <180° which is an obtuse angle.

Figure 11 *Nyotok Kacèr Movement*



The picture shows that the position of the dancer's right hand and left foot forms an angle of x<90° which is an acute angle, the right leg forms an angle of 180° which is a straight angle.

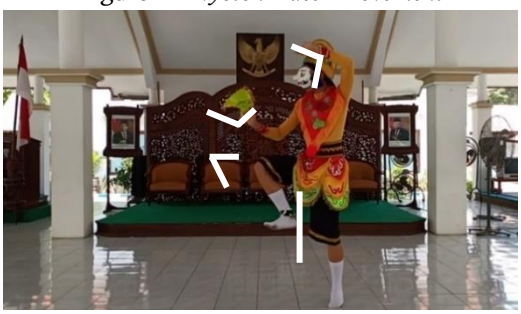
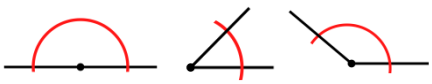


Figure 12 The *Nyotok Kangan* Movement

In this movement, the dancer walks sideways and lifts one leg and then raises one hand up and the other facing sideways as if pushing. This movement is performed by facing right and then turning to face left.



The figure shows that the position of the right and left hands forms an angle of 90°< x <180° which is an obtuse angle, the right foot forms an angle of x<90° which is an acute angle and the left foot forms an angle of 180° which is a straight angle.

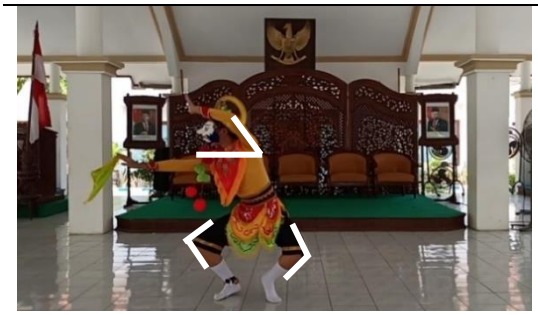
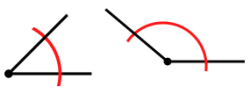


Figure 13 *Jeglong* Movement



The figure below shows that the position of the right and left hands forms an angle x<90° which is an acute angle, the right and left feet form an angle of 90°<x <180° which is an obtuse angle.

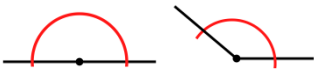
Jurnal Axioma: Jurnal Matematika dan Pembelajaran
Volume 8 No 2 Juli 2023
E ISSN 2615-0697 dan P ISSN 2622-8149
168 – 185

Figure 14 *Jeglong* Movement

In this movement, the dancer extends his arms sideways in one direction to the right or left, then waves his arms with his legs stretched out and slightly bent like a frog.

Figure 15 *Sembhâ Manjheng* movement

In this movement, the dancer moves with the hands worshiping with the body upright and the legs astride.



The picture below shows that the position of the dancer's right and left hands forms an angle of 180° which is a straightened angle, the dancer's right and left legs form an angle of 90°< x <180° which is an obtuse angle.

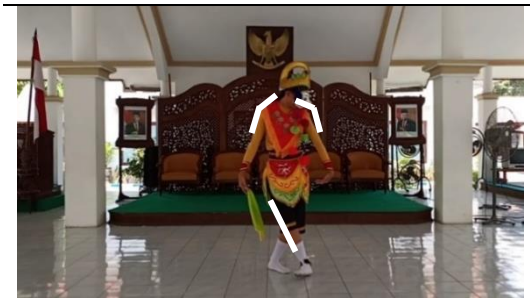


Figure 16 *Branyak* Movements

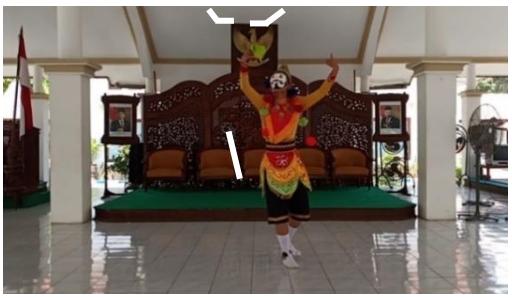
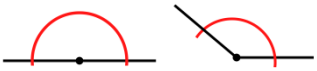


Figure 17 *Branyak* Movement

In this movement raise both hands up and then lower both hands down and balanced with a circular motion around the center of the staging or the center of the stage.



The picture below shows that the position of the dancer's right and left hands forms an angle of 90°< x <180° which is an obtuse angle, the dancer's right and left legs form an angle of 180° which is a straight angle.

Jurnal Axioma: Jurnal Matematika dan Pembelajaran
Volume 8 No 2 Juli 2023
E ISSN 2615-0697 dan P ISSN 2622-8149
168 – 185

Figure 18 The *Lembay Kangan-Kacèr* Movement

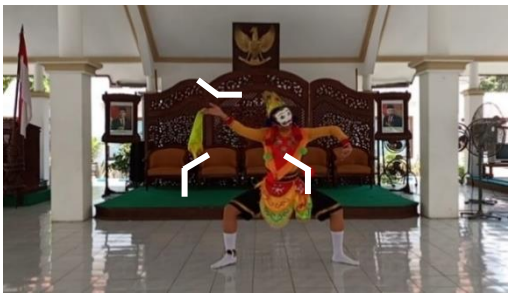


Figure 19 The *Lembay Kangan-Kacèr* Movement

In this movement, the dancers wave their hands to the right or left alternately with their feet astride.

The picture beside shows that the position of the right hand, left hand, right and left leg of the dancer forms an angle of 90°< x <180° which is an obtuse angle.

Figure 20 The Ngaca Nyorot movement

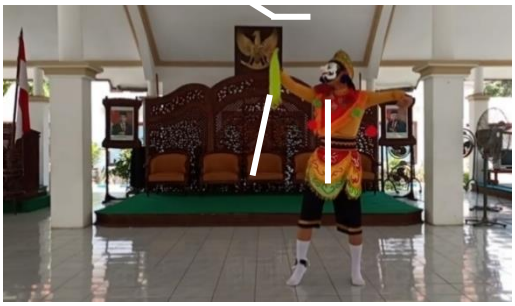
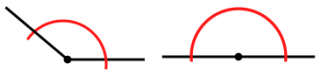
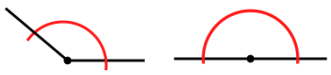


Figure 21 The Ngaca Nyorot movement

In this movement, the dancer raises his right hand up with his face looking at the palm of his right hand as if he is looking in a mirror and his left hand is bent facing forward with his legs spread apart and moving backwards.



The picture shows that the position of the dancer's right hand and left foot forms an angle of 90°< x <180° which is an obtuse angle and the right foot forms an angle of 180° which is a straight angle.



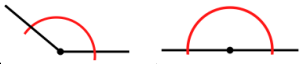
The picture shows that the position of the dancer's right hand forms an angle of 90°< x <180° which is an obtuse angle, the dancer's right and left legs form an angle of 180° which is a straight angle.

Jurnal Axioma: Jurnal Matematika dan Pembelajaran
Volume 8 No 2 Juli 2023
E ISSN 2615-0697 dan P ISSN 2622-8149
168 – 185

Figure 22 *Lènggang* Movement

Figure 23 *Lènggang* Movement

In this movement, the dancers wave their hands to the right and to the left with an upright and stout body as well as straddle leg movements moving to the right and left.

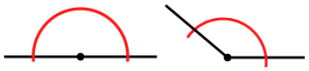


The picture shows that the position of the dancer's right hand and left foot forms an angle of 90°< x <180° which is an obtuse angle and the right foot forms an angle of 180° which is a straight angle.

The picture shows that the position of the right hand, left hand, right and left leg of the dancer forms an angle of 90°< x <180° which is an obtuse angle.

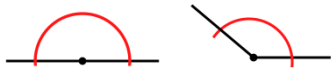
Figure 24 The *Pajuwân Kojèran* Movement

In this movement the position of the dancer's body is leaning to the lower right with both hands pulled straight to the side and oblique or diagonal with the legs astride.



On the side, it shows that the position of the right hand to the left hand forms an angle of 180° which is a straight angle, the dancer's right and left legs form an angle of 90°< x <180° which is an obtuse angle.

Figure 25 *Lawung* Movement



On the side it shows that the position of the right hand and right foot forms an angle of 90°< x <180° which is an obtuse angle, the left hand and left foot form an angle of 180° which is a straight angle

In addition, it shows that the position of the right hand and right foot forms an angle of 180° which

Jurnal Axioma: Jurnal Matematika dan Pembelajaran
Volume 8 No 2 Juli 2023
E ISSN 2615-0697 dan P ISSN 2622-8149
168 – 185

Figure 26 *Lawung* Movement

In this movement, the dancers make a double step movement to the right and to the left with both hands waving, some are moving their hands up and the other hand is moving them to the side, which is also balanced with a leg movement, one of which is upright and the other is doing an upright leg movement. Bend straight up.

is a straight angle, the left hand forms an angle x<90° which is an acute angle and the left foot forms an angle of 90°<x<180° which is an obtuse angle.

Figure 27 Meccè' Topeng Movement

In this movement, the dancers move their arms around as if they are fixing the mask and facing forward.

The picture beside shows that the position of the right hand, right and left feet of the dancer forms an angle of 90°< x <180° which is an obtuse angle.

Figure 28 *Penthângan Nyorot* Movement

The picture beside shows that the position of the right hand, right and left feet of the dancer forms an angle of 90°< x <180° which is an obtuse angle.

Figure 29 *Penthângan Nyorot* Movement

The picture below shows that the position of the right hand, left hand, right and left feet of the dancer forms an angle of 90°< x <180° which is an obtuse angle.

In this movement it is similar to waving right and left but the leg movements straddle and move backwards.

Jurnal Axioma: Jurnal Matematika dan Pembelajaran
Volume 8 No 2 Juli 2023
E ISSN 2615-0697 dan P ISSN 2622-8149
168 – 185

Figure 30 The *Lèn.bʉy Gâgâ'* Movement

Figure 31 The *Lèmbay Gâgâ'* Movement

In this movement, the dancer raises one of his arms straight to the side and bends the other hand close together, then makes this movement to the right and to the left with crossed leg movements.

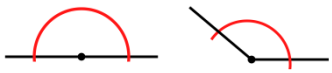
In addition, it shows that the position of the right hand, right foot and left foot forms an angle of 180° which is a straight angle and the left hand forms an angle x<90° which is an acute angle.

On the left, it shows that the position of the left hand, right foot and left foot forms an angle of 180° which is a straight angle and the left hand forms an angle x<90° which is an acute angle.

Figure 32 The Lèmbay *Gejug* Movement

Figure 33 *Gejug Lèmbay* Movement

In this movement the dancer holds his waist right and left then moves to the right and left with crossed leg movements.

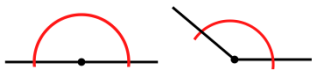


On the left, it shows that the position of the right and left hands forms an angle of 90°< x <180° which is an obtuse angle, the right and left feet form an angle of 180° which is a straight angle.

Jurnal Axioma: Jurnal Matematika dan Pembelajaran
Volume 8 No 2 Juli 2023
E ISSN 2615-0697 dan P ISSN 2622-8149
168 – 185

Figure 34 Gejjugân Movement

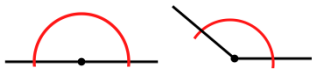
In this movement the dancer faces the body to the left with the position of the left hand lifted straight up the head and the right hand holding the hips with the left leg standing straight and the toes of the right foot are tapped down (floor).



On the side it shows that the position of the left hand and left foot forms an angle of 180° which is a straight angle and the right foot forms an angle of 90°< x <180° which is an obtuse angle.

Figure 35 Movement of *Nengkong Gejjug*

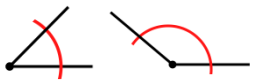
In this movement the dancer performs a half-squat movement in which the right leg is bent half-upright and the left leg is bent back and both hands make a twirling motion as if to justify the mask.



On the side it shows that the position of the right and left hands forms an angle of 180° which is a straight angle and the right foot forms an angle of 90°< x <180° which is an obtuse angle.

Figure 36 The Keddhu' Maju Movement

In this movement, the dancer's legs are bent with the body bent with the direction of movement moving forward and there is a worshiping movement in the movement of the hands.



The picture below shows that the position of the dancer's right and left hands forms an angle of x<90° which is an acute angle, the dancer's right and left legs form an angle of 90°<x <180° which is an obtuse angle.

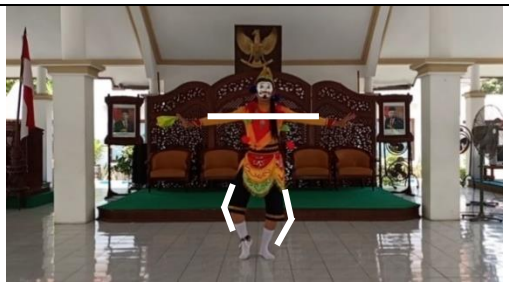
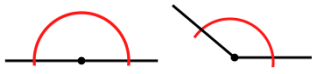


Figure 37 The Keddhu' Nyorot Movement



On the side shows that the position of the hands to the left of the dancer
forming an angle of 90°< x <180° which is an obtuse angle, the dancer's right and left legs form

In this movement, the dancer's legs are bent with the body upright with the direction of movement moving backwards and there is a movement of stretching both hands to the side in the movement of the hands.	an angle of 90°< x <180° which is an obtuse angle.

From the description of the dance movements above, there are several explanations related to variations of motion in the Ghetak Mask Dance and an explanation regarding a deeper presentation of the mathematical concepts analysis in each movement in the Ghetak Mask Dance which has been analyzed by researchers who have been fully presented in table 1. From all the discussion above, the mathematical concepts regarding the angular material in the dance movements of the Ghetak Mask Dance can be qualified in table 2 below.

Table 2. The Geometry Concepts Found in the Pamekasan's Ghetak Mask Dance Movement

No	Found Angle Geometry Concept	Image Code
1	Acute angle	Figure 11, Figure 12, Figure 13, Figure 14 Figure 26, Figure 30, Figure 31, Figure 36
2	Obtuse angle	Figure 1, Figure 2, Figure 3, Figure 4, Figure 5, Figure 6, Figure 7, Figure 8, Figure 9, Figure 10, Figure 12, Figure 13, Figure 14, Figure 15, Figure 16, Figure 17, Figure 18 , Figure 19, Figure 20, Figure 21, Figure 22, Figure 23, Figure 24, Figure 25, Figure 26, Figure 27, Figure 28, Figure 29, Figure 32, Figure 33, Figure 34, Figure 35, Figure 36, Figure 37
3	Straightened Angle	Figure 1, Figure 2, Figure 5, Figure 6, Figure 11, Figure 12, Figure 15, Figure 16, Figure 17, Figure 20, Figure 21, Figure 22, Figure 24, Figure 25, Figure 26, Figure 30, Figure 31, Figure 32, Figure 33, Figure 34, Figure 35, Figure 37

Based on the data analysis above, the geometric concepts found in the Ghetak Mask dance are angular geometry, two-dimensional geometry and geometric transformations. This is in accordance with research (Nurus Sa'adah et al., 2021) that the concept of two-dimensional geometry is found in the position of the feet of the dancers when they are moving, while the concept of geometric transformation is through body twisting movements. The concepts in the Ghetak Mask dance can be integrated into learning mathematics. This is in accordance with the integration of mathematical concepts found in culture inside mathematics learning so that they can be used as tools, media and learning resources in the implementation of mathematics learning (Abi, 2017; Dhofir et al., 2019; Hardiarti, 2017; Putri, 2017; Sarwoedi et al. al., 2018).

CONCLUSIONS AND SUGGESTIONS

Based on the results of this study, it can be concluded that the mathematical concepts contained in the movements of the Ghetak Pamekasan Mask dance, namely angular geometry include: acute angles, obtuse angles

and straight angles. Mathematical concepts in every movement in the Ghetak Pamekasan Mask dance so as to produce a clear explanation of the angular geometry concept that exists in every Ghetak Mask dance movement which is found on the hands and feet of dancers when performing dance movements.

The concept of angular geometry or acute angle is obtained from motion *Nyotok Kacèr, Nyotok Kangan, Jeglong, Lènggang, Lèmbay Gâgâ' dan Keddhu' Maju. The concept of angular geometry or obtuse angles is obtained from motion Singget, Nyèrèk, Meccè' Topèng Addhep Ka Budih, Tolèân Tello', Ngoncèr Kacèr, Ngoncèr Kangan-Kacèr, Ngaca Gâgâ', Ngaca Lonca' Kangan-Kacèr, Gidek Bengkong, Sembhâ Manjheng, Branyak, Lembay Kangan-Kacèr* (*Gâgâ'*), *Ngaca Nyorot, Lènggang, Kojèran Pajuwân, Lawung, Meccè' Topèng, Penthângan Nyorot, Lèmbay Gejjug, Gejjugân, Nèngkong Gejjug dan Keddhu' Maju. The concept of angular geometry or straight angles is obtained from motion Singget, Nyèrèk, Ngoncèr Kacèr, Ngoncèr Kangan-Kacèr, Nyotok Kacèr, Nyotok Kangan, Sembhâ Manjheng, Branyak, Ngaca Nyorot, Lènggang, Kojèran Pajuwân, Lawung, Lèmbay Gâgâ', Lèmbay Gejjug, Gejjugân, Nèngkong Gejjug dan Keddhu' Nyorot.*

The mathematical concepts contained in the dance movements of the Ghetak Pamekasan Mask dance above can be used to introduce the initial mathematical concept of angles through local wisdom. Thus learning mathematics in class will be more meaningful because this is no longer strange to students, and also it is already known and contained in their own local wisdom. Abstract mathematical concepts will become concrete if they already know the mathematical concepts in the Ghetak Mask dance.

Based on the results of the research above, the researchers suggest the Pamekasan's Ghetak Mask dance as a medium for learning mathematics, especially in the concept of geometry so that in this study " Pamekasan's Ghetak Mask Dance Movement in Ethnomatematics" can be applied in the learning process as a teaching material to introduce Pamekasan's distinctive culture to students. Thus, it is building students' knowledge of mathematical concepts that emerge from the surrounding cultures.

REFERENCES

Abi, A. M. (2017). Integrasi Etnomatematika Dalam Kurikulum Matematika Sekolah. *JPMI (Jurnal Pendidikan Matematika Indonesia)*, *1*(1), 1. https://doi.org/10.26737/jpmi.v1i1.75

Aini, Z., Afifah, N., Muslim, I., & Hasanah, S. I. (2019). Etnomatematika: Eksplorasi Budaya Kerabhen Sape Madura. *Journal of Medives : Journal of Mathematics Education IKIP Veteran Semarang*, *3*(2), 177. https://doi.org/10.31331/medivesveteran.v3i2.856

Andari, R. D., Wahyuni, S., Arohman, R. K., & Zayyadi, M. (2022). Eksplorasi Eduwisata Garam Sebagai Metode Pembelajaran Matematika Era New Normal. *Lattice Journal : Journal of Mathematics Education and Applied*, *2*(1), 40. https://doi.org/10.30983/lattice.v2i1.5275

Andriyani, & Kuntarto, E. (2017). Etnomatematika : Model Baru Dalam Pembelajaran. *Jurnal Gantang*, *2*(2), 133–144. http://ojs.umrah.ac.id/index.php/gantang/index

Dhofir, D., Halim, D., Nisa, S., & Zayyadi, M. (2019). Loteng (Selodor Bhanteng): Media Nostalgia dalam Menanamkan Konsep Matematika pada Anak Madura. *Jurnal Elemen*, *5*(2), 220. https://doi.org/10.29408/jel.v5i2.1344

Firdaus, M., & Hodiyanto, H. (2019). Eksplorasi Etnomatematika Islami Pada Tradisi Makan Besaprah. *AKSIOMA: Jurnal Program Studi Pendidikan Matematika*, *8*(3), 508–519. https://doi.org/10.24127/ajpm.v8i3.2385

Hafsi, A. R., & Hasanah, S. I. (2018). Kajian Etnomatematika Pada Rumat Adat Taneyan Lanjeng Ethnomatematic Studies at Tanean Lanjeng Traditional House. *Prosiding Silogisme Seminar Nasional Pendidikan Matematika Universitas PGRI Madiun*, *July 2018*, 191–197. http://prosiding.unipma.ac.id/index.php/PSNPM/article/viewFile/602/601

Hardiarti, S. (2017). Etnomatematika : Aplikasi Bangun Datar. *Aksioma*, *8*(2), 99–110.

Hutauruk, A. J. (2020). Karakteristik Etnomatematika dalam Pembelajaran Sekolah. *Prosiding Webinar Ethnomathematics*, *1*(1), 58–62.

Nurus Sa'adah, Arghob Khofya Haqiq, & Putri Nur Malasari. (2021). Etnomatematika Gerakan Tari Kretek Kudus Pada Pembelajaran Matematika. *Journal of Mathematics Education*, *3*(1), 58–71. http://dx.doi.org/10.15408/ajme.v3i1.20544

Pasya, S. A. N., Probosini, A. R., & Djatmiko, G. (2021). Nilai-Nilai Pendidikan Karakter pada Tari Topeng Getak di Rumah Seni Madhu Ro'om Pamekasan Madura. *Indonesian Journal of Performing Arts Education*, *1*(2), 33–41. https://doi.org/10.24821/ijopaed.v1i2.5526

Powell, A. B. (2002). Ethnomathematics and the Challenges of Racism in Mathematics Education. *Proceedings of the Third International MES Conference*, *December*, 1–15.

Prabawati, M. N. (2016). Etnomatematika Masyarakat Pengrajin Anyaman Rajapolah Kabupaten Tasikmalaya. *Infinity Journal*, *5*(1), 25. https://doi.org/10.22460/infinity.v5i1.p25-31

Putri, L. (2017). Eksplorasi Etnomatematika Kesenian Rebana Sebagai Sumber Belajar Matematika Pada Jenjang Mi. *Jurnal Ilmiah Pendidikan Dasar UNISSULA*, *4*(1), 136837.

Rachmawati, I. (2012). Eksplorasi Etnomatematika Masyarakat Sidoarjo. *Ejournal Unnes*, *1*(1), 1–8.

Rosa, M., & Orey, D. (2011). Ethnomathematics: the cultural aspects of mathematics. *Revista Latinoamericana de Etnomatemática*, *4*(2), 32–54. http://www.revista.etnomatematica.org/index.php/RLE/article/view/32

Sari, T. A. M., Sholehatun, A. N., Rahma, S. A., & Prasetyo, R. B. (2021). Eksplorasi Etnomatematika pada Seni Batik Madura dalam Pembelajaran Geometri. *Journal of Instructional Mathematics*, *2*(2), 71–77.

https://doi.org/10.37640/jim.v2i2.1032

Sarwoedi, Marinka, D. O., Febriani, P., & Wirne, I. N. (2018). Efektifitas etnomatematika dalam meningkatkan kemampuan pemahaman matematika siswa. *Jurnal Pendidikan Matematika Raflesia*, *03*(02), 171–176. https://ejournal.unib.ac.id/index.php/jpmr/article/view/7521

Shirley, L. (2015). Mathematics of students ' culture : A goal of localized ethnomathematics Matemáticas de la cultura de los estudiantes : el objetivo de las. *Revista Latinoamericana de Etnomatemática*, *8*(2), 316–325.

Zayyadi, M. (2017). Eksplorasi Etnomatematika Pada Batik Madura. *SIGMA*, *2*(2), 35–40.

Zayyadi, M., & Halim, D. (2020). Etnomatematika Budaya Madura (Budaya Madura dan Matematika). In *Duta Media* (1st ed.).

Zayyadi, M., Hasanah, S. I., & Surahmi, E. (2018). Ethnomatematics Exploration in Traditional Games As A Form Of Student' Social Interaction. *JIPM (Jurnal Ilmiah Pendidikan Matematika)*, *6*(2), 125–132. https://doi.org/10.25273/jipm.v6i2.1826