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Ethnomathematics Activities in *Kain Timur* Making (The Moi Tribe *Mas Kawin* Tradition, Sorong City, West Papua)

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ABSTRACT
The mathematical ability of students according to PISA 2018 data is still lacking, one of the reasons is that mathematics learning currently tends to be conventional and lacks contextual. One way is to integrate culture and mathematics in the learning process based on local wisdom. Ethnomathematics is designed to reveal the social and cultural roots that explain mathematical practice, and as a bridge between cultures, become a way to express behaviour through the exchange of mathematical knowledge and offer a new approach in the academic field. This study aims to explore ethnomathematical-based mathematical ideas in the process of weaving *kain timur* which is an inseparable part of the dowry procession tradition in the Moi Tribe community. This study took place in the village of *Malanu Kampung*, North Sorong sub-district, Sorong district, West Papua province. This research is qualitative research using an ethnographic approach. The results of this study indicate that the process of making *kain timur* weaving contains mathematical activities include counting, measuring, designing, and explaining. The conclusion is that there is mathematical activity in the process of weaving *kain timur* in the dowry tradition in the Moi tribal community. Mathematical concepts of a two-dimensional shape and a geometry shape on the part of unravelling the threads, which include squares, spheres and rectangles. The concept of number patterns is also found in the process of forming tie motifs using arithmetic sequences.

Keywords: *Mathematics, Culture, Ethnomathematics, Kain timur.*

1. INTRODUCTION

The era of globalization in the 21st century has affected all aspects of life, from science, social, technology, education to culture. Changes that are so fast and the emergence of various challenges as a result of these changes must be faced by all parties so as not to erode Indonesian culture through education with a global perspective but not eliminating diversity.

The role of the government through the world of education in it is required to be able to make a significant contribution. One of them is stated in the Strategic Plan of the Ministry of Education and Culture 2020-2024 through the Pancasila student profile which must be applied and developed among current students, which includes Global Diversity.

Culture is knowledge that is acquired by someone [1] so that it fosters a learning culture to be useful for students and the community in general has been carried out by the Indonesian government through the National Education System Law by involving the participation of the community to be active in the implementation of education, The community in its social and cultural environment has the right to organize community-based education in formal and non-formal education for the benefit of the community itself [2].

According to 2018 PISA data, Indonesian students scored lower in math and science. the average ranking of students mathematical abilities in Indonesia is below the OECD standard [3]. One of the reasons is that mathematics learning currently tends to be conventional and lacks contextual [4]. The mindset in

the 2013 curriculum as single knowledge into learning multiple sciences, so it is very clear that the learning process of mathematics is not only focused on the concepts and definitions of mathematics but rather on the relationship and relationship between mathematics and the real world.

Elucidation of the Law of the Republic of Indonesia Number 20 of 2003 concerning the National Education System Article 37 paragraph 1 explains Mathematics learning is intended to develop students' logic and thinking skills which include arithmetic, geometry, and algebra. The benefits of logic include being used to think correctly, carefully, objectively and to avoid logical fallacies [5] and in accordance with mathematics which produces definite and objective values [6].

The contextual-based learning process of mathematics through culture is known as ethnomathematics which was popularized by D'Ambrosio a mathematician from Brazil, at the meeting of the American Association for the Advancement of Science in the United States in 1977. Ethnomathematics is designed to reveal the social and cultural roots that explain the practice of mathematics, and as a bridge between cultures, becomes a way to express behaviour through the exchange of mathematical knowledge and offers a new approach in the academic field [7].

Ethnomathematics is seen as a subfield of mathematics education and can be applied in mathematics learning procedures both in the classroom and outside the classroom, addressing cultural diversity in the classroom and as a means of practice for students and teachers [8]. D'Ambrosio describes ethnomathematics as a teaching methodology designed to fit the school culture of students as a basis for helping them understand themselves and their peers, develop and structure social interactions, and conceptualize mathematical knowledge [9].

Introducing culture through ethnomathematics will greatly impact and contribute directly to the new generation to better know and recognize and teach mathematics through culture. [10] argues that culture has an influence on how to acquire and use mathematical knowledge so that ethnomathematics can be used to integrate the culture of students and learning mathematics. Research conducted by [11] describes mathematical activities based on the values inherent in the daily practice of Sundanese culture, reflected in measuring activities based on the objects used and based on cultural activities carried out for generations.

Research conducted by [12] explains the geometric shapes in the form of parallelograms and rectangles at the *Muaro Jambi* temple. Likewise with the research conducted by [13] explained that the movement in traditional Balinese dance shows the shape of an acute angle ($0 < \alpha < 90$) seen in the *ngumbang* movement, while a right angle ($\alpha = 90$) is seen in the *agem* and *ulap-ulap* movements and an obtuse angle seen in the *ngelung* movement and *ulap-ulap* ($90 < \alpha < 180$).

The culture of Papua and West Papua is diverse, objects of art and handicrafts are found in abundance and have mathematical activities found from these cultures. Research related to the *Noken* bag conducted by [14] which is a traditional Papuan traditional bag shows the concept of geometry. Furthermore, [15] explained the activity of designing the *sero* and determining the location of the *sero* in the culture of the *Kokas* people of *FakFak* West Papua according to the topic of geometry.

[16] explains that the six basic activities that can always be found in daily activities are: counting, locating, measuring, designing, playing and explaining. According [16][17] The mathematical activities are described in Table 1.

Research by [18] explain The mathematical activity obtained from the process of making marble is counting, measuring, designing dan explaining.

In essence, it can be said that the residential area of the Moi Tribe covers the area of Sorong Regency, the northern part of the southern Sorong Regency and the southern part of the Raja Ampat Regency and consists of seven customary sub-cultures, including *Moi Legin, Moi Abun, Moi Karon, Moi Klabra, Moi Salmak, Moi. Segin* and *Moi Maya* as well as the use of the Moi language as a means of communication which is divided into various dialects of *Moi Legin, Madik, Salmak, Abun, Karon, Segin, Klabra*. The *Moi Maya* are an indigenous tribe from the Raja Ampat area who inhabit Salawati Island, Batanta Island and Waigeo Island [19].

The Moi tribe carry out kinship through marriage called *simin* (household) as a relationship between clans or *keret* using *kain timur* [19]. The existence of the *kain timur* in the land of the Papuan bird's head cannot be separated from history and mythical stories. Massink in [20] said that the origin of the *kain timur* was told of a woman who was resting on a rock pillow, the woman fell asleep and dreamed that there was a snake under the rock. When she woke up, the woman immediately got up and took a machete and rolled a stone but found no snake in her dream, but only a piece of cloth and believed to be *kain timur*.

Table 1. Activities mathematics

No	Activities Mathematics	Classification
1	(Counting) This is a way of distinguishing, tallying or apprehending quantities of objects or events which may be perceptually or conceptually available. It is an activity which is stimulated by, and in tum affects, the cognitive processes of classifying and pattern-seeking	Quantifiers (each, some, many, none); Adjectival number names; Finger and body counting; Tallying; Numbers; Place value; Zero; Base 10; Operations on numbers; Combinatorics; Accuracy; Approximation; Erros; Fractions; Decimals; Positive, Negatives; Infinitely large, small; Limit; Number patterns; Powers; Number relationships; Arrow diagrams; Algebraic representation; Events; Probabilities; Frequency representations
2	(Locating) This involves the positioning of one self and other objects in the spatial environment. The three dimensions of spatial thinking are physical or object space, sociographical space and cosmological space	Prepositions; Route descriptions; Environmental locations; N.S.E.W. Compass bearings; Up/down; Left/right; Forwards/Backwards; Journeys (distance); Straight and Curved lines; Angle as turning Rotations; Systems of location: Polar coordinates, 2D/3D coordinates, Mapping; Latitude / Longitude; Loci; Linkages; Circle; Ellipse; Vector; Spiral
3	(Measuring) This is a system of measuring quantities or entities which cannot be counted or located spatially. It involves comparing, ordering and quantifying	Comparative quantifiers (faster, thinner); Ordering; Qualities; Development of units (heavy-heaviest-weight); Accuracy of units; Estimation; Length; Area; Volume; Time; Temperature; Weight; Conventional units; Standard units; System of units (metric); Money; Compound units
4	(Designing) This refers to the process of imposing a plan, structure or imagined shape on a surface or space. The importance of the activity is connected to the perceived relationship between the object and purpose, the designed form does not actually have to be made	Design; Abstraction; Shape; Form; Aesthetics; Objects compared by properties of form; Large, small; Similarity; Congruence; Properties of shapes; Common geometric shapes, figures and solids; Nets; Surfaces; Tessellations; Symmetry; Proportion; Ratio; Scale-model Enlargements; Rigidity of shapes
5	(Playing) Playing is the generalized social activity which imitates and creates models of reality, abstracting from it certain forms and structures. Games are the formalization. of play in which rules, sets of procedures and risk-taking are introduced within a structure.	Games; Fun; Puzzles; Paradoxes; Modelling; Imagined reality; Rule-bound activity; Hypothetical reasoning; Procedures; Plans Strategies; Cooperative games; Competitive games; Solitaire games; Chance, prediction
6	(Explaining) Definition of explaining includes ways of representing relationships between phenomena, and for this reason, evidence of logical thinking or reasoning will be included in the category of explaining	Similarities; Classifications; Conventions; Hierarchical classifying of objects; Story explanation; logical connectives; Linguistic explanations: Logical arguments, Proofs; Symbolic explanations: Graphs, Diagrams, Charts, Matrices; Mathematical modelling; Criteria: internal validity, external generalizability.

The history of the entry of *kain timur* in West Papua dates back to the first half of the 16th century, originating from the *Nusa Tenggara* islands and the *Maluku* islands through trading activities and functioning as a socio-economic medium of exchange, as a gift between friends, in wedding ceremonies as a means of paying dowry and as a means of payment for dowry. the dowry payer is more important among other things [20].

Based on the explanation above regarding the relationship between culture and mathematics as well as the cultural diversity of West Papua, especially the culture of the Moi tribe, research that aims to explore ethnomathematics in the manufacture of eastern fabrics as an inseparable part of the dowry tradition of the Moi tribe is important and needs to be done. In addition, through this writing, it can provide information knowledge to all parties so that they can

better know the culture of the Moi tribe, especially for students and teachers.

2. METHOD

This research method is through a qualitative. The purpose of this study was to collect information, explore in depth, and describe mathematical activities according to [16] in the process of making *kain timur* with an ethnographic approach. Litchman in [1] explains that the purpose of qualitative research is to gain an in-depth understanding, interpretation and description of human experience.

The Moi call the *kain timur toba nas* and *toba jornas*. *Toba nas* and *toba jornas* are types of *kain timur* that have a very valuable value for the Moi tribe and are rectangular in shape.

The value of the cloth is very dependent on the age of the *kain timur*, the longer the eastern cloth, the more expensive the selling value of the cloth. The *kain timur* is also symbolized as a sign of the ability and readiness of a man to propose to a woman who will be his life partner.

The data in this study are ethnomathematical activities obtained from field notes data through writings made during observation and interviews as well as documentation of activities in the process of making *kain timur*. Oral data through interviews from informants who have 30 years of experience and have trained in the manufacture of woven fabrics organized by the Women's Empowerment Service of Sorong City in 2006. The location of this research is in *Malanu Kampung* Village, North Sorong District, Sorong City, West Papua.

Data collection techniques to support activities with the help of supporting instruments, where in this study the supporting instruments used were observation guidelines and interview guidelines. The main instrument in qualitative research is the researcher himself so that the success or failure of the research depends on the researcher himself.

Data validity activities were carried out by triangulating sources, times and methods. Researchers collect information from resource persons continuously and require a relatively long time, through various methods with the help of cell phones equipped with voice recording equipment, video recording, photo documentation. As well as reviews from participants who have the ability in the field of mathematics. In this study, data related to the process of weaving eastern fabrics were analysed by reducing the data, and displaying *kain timur* data at the stages of the process, then grouping them into appropriate mathematical activities.

3. RESULT AND DISCUSSION

The existence of eastern cloth as a very valuable object in the dowry procession in the Moi Tribe community cannot be separated from the process of making *kain timur* itself, using traditional equipment in the form of a series of wood that stretches in the form of a rectangle measuring 200 cm long and 120 cm wide which can be connected and joined together. removed between one end of the wood with the other end of the wood.

The process of weaving eastern fabrics is also done by hand which requires special skills from the fabric maker itself and requires process steps that require very high concentration. These special skills include counting the number of motif veins using a finger consisting of 6 threads and tied with *raffia* rope until the motif veins are collected according to the specified number, the motifs are 1, 3, 5, 7, 9 and so on as many as odd numbers. depending on the size of the motif. Illustration of someone making *kain timur* as shown in Figure 1.

Figure 1 Mrs. Helena M Hope is making *kain timur*.

The process of making *kain timur* is basically making a thread description according to the cloth motif which consists of 3 main motifs, namely tie motifs, lift motifs and variation motifs. The three motifs are an inseparable part of the process stage carried out on the span rack until finally the tie motif veins are woven together with lifting motif veins and variation motifs. Mrs. Helena M Hope is one of the *kain timur* weaving craftsmen in the Sorong city who still exists to make *kain timur* in Figure 1 and the stages of the process of making *kain timur* can be seen on Table 2.

Mathematical activities according to Bishop (1998) in the process of weaving eastern cloth are as follows:

Table 2. Eastern fabric weaving process

No	Stage	Activity Steps
1	Preparation	a. Determine the fabric pattern b. Checking the availability of raw materials for white yarn and other colored yarn c. Raw materials are ordered by craftsmen where the raw materials in the form of yarn are obtained from cotton yarn producers located in the city of Solo and the city of Maumere
2	Unravel	a. Unravelling the yarn on a rectangular propeller rack b. Form skeins of white yarn and colored yarn, each by hand into a ball of yarn c. Unravelling white threads and other colored threads that will be used as tie motifs on the shelf
3	Fabric Motif Formation	a. Tie the threads according to the pattern of the tie motif using a rope on the shelf
4	Coloring	a. Dyeing the white thread according to the ties pattern
5	Formation of lift motifs and variation motifs on span racks	a. Unravelling the thread that has formed a pattern of tie motifs on the span shelf b. Adjusting the distance between the ties of one ikat motif with another c. Putting two slices of bamboo to determine the basis of the lifting motif and the variation motif d. Unravelling white threads and other colored threads that will be used as lifting motifs and motifs for variations on the shelf e. Installing the net thread on all the motifs that have been stretched on the span rack with the help of aluminum pipes. Parallon pipes and wooden looms shaped like machetes are used to smooth the threads f. Completely tidy up the thread description before transferring to the weaving rack
6	Weaving	a. Putting the description of the tie motif thread, lift motif and variation motif on the weaving rack b. Putting red, black, brown filled threads that are tailored to the motif c. Tighten the filling thread with wood that resembles a machete d. Eastern cloth motif is formed e. The eastern cloth has been completed

3.1. Design

Figure 2 is the preparatory stage in the parsing process. At this stage the yarn as, raw material is parsed on a rectangular propeller rack. After that, the craftsmen carry out the process of rolling manually to form a ball using the finger. There is a mathematical activity in the parsing process, namely shape. in line with the research conducted by [21] on the tradition of shaving hair that uses tumpeng rice which is more towards a cone shape.

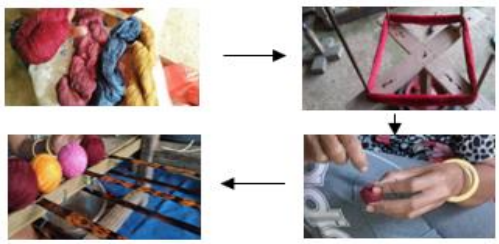

Figure 2 Stages of unravelling the thread.

3.2. Measuring

Span rack and weaving rack measuring 2 m x 1.2 m. Span racks and weaving racks are used to place threads that will be designed according to the size of the eastern fabric and are two-dimensional, for the eastern fabric sizes vary from 140 cm x 87 cm, 160 cm x 76 cm, 154 cm x 23 cm depending on the order. There is a mathematical activity on the size of the span rack, the weaving rack and the eastern fabric size. in line with the research conducted by [18] on the making marble that has two-dimensional rectangular pattern.

3.3. Counting and Explaining

Figure 3 is the stage in the process of forming the tie motif. At this stage, 6 (six) threads are collected as many as 13 (thirteen) descriptions that form the tie motif where the threads are separated by rope. The motif can be more than or equal to 1, if i is the motif, it can be symbolized by {i ≥1 ; i is an odd number}. There are mathematical activities in the process of forming the tie motif, namely the pattern number and Symbolic Explanation. in line with the research conducted by [22] on the making *kemplang* which indicate that context *kemplang* and paper-making circles as a model really helps students to understand the concept of a pattern of numbers and has an important role to generate trajectories of students in the learning patterns of numbers in junior high school.

Figure 3 Stages of forming a tie motif

The square shape occurs from the process of unravelling the threads on the propeller rack which is made of a series of four woods arranged and given holes to put wood slices in each hole. From the process of parsing, it looks like a square two-dimensional shape

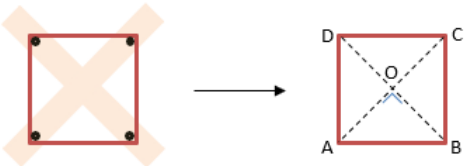

Figure 4 Geometry modelling in the process of unravelling the yarn in the propeller rack

From the Figure 4, it can be seen that the shape of a quadrilateral has four sides. The four sides have the same side length (AB = BC = CD = DA) and the four angles are right angles or 90º (∠A=∠B=∠C=∠D). It has two diagonals of the same length (AC = BD) and intersects perpendicularly and divides the two equal lengths in the middle (AO = OC = BO = OD). It has 4 axes of symmetry.

Spherical geometry is also found in the process of unravelling the yarn. After the thread is parsed on the propeller rack, the next process is continued by unravelling the thread by hand until a series of ball-shaped threads is formed.

Figure 5 Geometry modelling in the process of unravelling yarn by hand

The shape of the geometrical concept of spherical shape is found in the process of unravelling the thread by hand by slowly forming the string of threads into a ball shape. The shape of the ball that happened turned out to be very easy for craftsmen to carry out the next process, namely unravelling the threads on the span rack to make tie motifs.

Based on the figure, the characteristics of the ball in the thread series in Figure 5 are Build a round and three-dimensional space. The side of the sphere is a collection of points that are equidistant from the centre of the sphere, in other words, the distance from the centre of the sphere to any point on the surface of the sphere is the same. The sphere is one of the curved side shapes which is composed of an infinite number of circles. If the circle cantered at point O is rotated about the point AOC or COA as the axis of rotation, we get a spherical shape

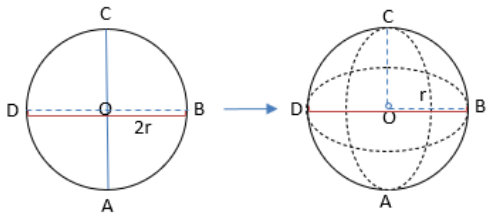

Figure 6 Geometry shape circle and sphere

Geometry shape of sphere has no ribs. In the Figure 6 above, the part named with r is the radius of the sphere. The radius of the sphere connects the centre of the sphere with the points on the surface of the sphere.

The diameter of the ball is twice the size of the radius of the ball. The line space joining two points on the sphere is called the spherical chord. The longest spherical bowstring is the diameter of the ball.

Geometric shapes are also found in the process of stretching the yarn on a rectangular span rack in the process of unravelling the yarn to form a tie motif.

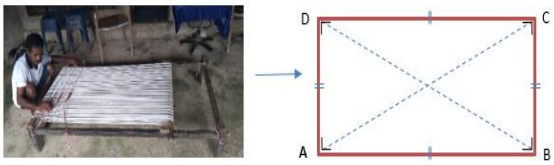

Figure 7 Geometry modelling on span rack

Based on Figure 7, the properties of rectangles found on the shelf are that they have four sides (AB, BC, CD and DA) and the four corners are right angles or 90º (∠ A= ∠ B= ∠ C= ∠ D). The parallel and opposite sides are the same length (AB = CD, AD = BC) and have two diagonals that are the same length (AC = BD). It has 2 rotational symmetries and 2 folding symmetries. The concept of a rectangle is not only found on the shelf, but also on the eastern fabric and weaving racks which are rectangular.

The process of forming a tie motif consisting of 6 strands of thread tied with a rope and collected as many as odd numbers was also found and in accordance with the concept of number patterns.

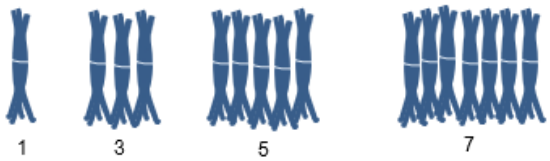

Figure 8 Modelling of tie motifs

In Figure 8 above, the number of tie threads, if counted in each bundle, becomes a pattern of numbers 1, 3, 5, 7 and so on as many as odd numbers. If the first term (U1) is 1, the second term (U2) is 3 then the difference between the first term and the second term (b) is 2 then the formula for the nth term of the sequence pattern is Un=a+(n-1)b and the sum of the terms nth is Sn= n/2(2a+(n-1)b). There is a mathematical concept found in the process of forming a tie motif known as an arithmetic sequence.

4. CONCLUSION

The process of making *kain timur* as part of the dowry tradition in the Moi tribal community can be used to add insight to students regarding the culture in their area so that the manifestation of diversity can be achieved by introducing culture through ethnomathematics, one of which is the culture of the Moi tribe. The results of this study indicate that the process of making eastern cloth fulfills mathematical activities, but only consists of 4 activities, namely counting, measuring, designing and explaining.

Mathematical concepts can be found in the dowry culture of the Moi tribe that uses eastern cloth, one of which is in the process of making eastern cloth. In the process of making eastern fabrics, you can find the concept of a two-dimensional shape and a geometry shape on the part of unravelling the threads, which include squares, spheres and rectangles. The concept of number patterns is also found in the process of forming tie motifs using arithmetic sequences. Teachers can use it as a concrete learning resource for mathematics. Ethnomathematical objects that are around us can be used to carry out innovative learning.

REFERENCES

[1] Budiyono, *Pengantar Metodologi Penelitian Pendidikan*, 1st ed. Surakarta: UPT Penerbitan dan Pencetakan UNS (UNS Press), 2017.

[2] *Undang-Undang Nomor 20 Tahun 2003*. Indonesia, 2013.

[3] OECD, "What Students Know and Can Do: Indonesia," 2019. [Online]. Available: https://www.oecd-ilibrary.org/education/pisa-2018-results-volume-iii_bd69f805-en%0Ahttps://www.oecd-ilibrary.org//sites/bd69f805-en/index.html?itemId=/content/component/bd69f805-en#fig86.

[4] Y. J. Kehi, Z. M, and S. B. Waluya, "Kontribusi Etnomatematika Sebagai Masalah Kontekstual dalam Mengembangkan Literasi Matematika," in *Prisma, Prosiding Seminar Nasional Matematika*, 2019, vol. 2, pp. 190–196.

[5] C. K. Ratih, I. P. Priyadi, H. A. Nugroho, A. Tiharapitra, B. Djokosumbogo, and Karyana, *Bahan Ajar Simulasi Dan Komunikasi Digital Untuk SMK/MAK*, 1st ed. Jakarta: Direktorat Pembinaan SMK, 2017.

[6] J. R. Brown, *Philosophy of mathematics: A contemporary introduction to the world of proofs and pictures*. 2010.

[7] M. Mesquita, S. Restivo, and U. D'Ambrosio, *Asphalt Children*. 2011.

[8] H. Pandey and A. Bajpai, "Concept and Role of Ethnomathematics in Mathematics Education," *Emerg. Trens Educ.*, vol. 9, no. 1, pp. 17–27, 2019.

[9] M. Rosa and D. C. Orey, "Ethnomathematics : the cultural aspects of mathematics Etnomatemática : os aspectos culturais da matemática," *Rev. Latinoam. Etnomatemática*, vol. 4, no. 2, pp. 32–54, 2011.

[10] D. C. Orey and M. Rosa, "Ethnomathematics : cultural assertions and challenges towards pedagogical action.," *J. Math. Cult.*, vol. 1, no. 1, pp. 57–78, 2006.

[11] D. Muhtadi, Sukirwan, Warsito, and R. C. I. Prahmana, "Sundanese ethnomathematics: Mathematical activities in estimating, measuring, and making patterns," *J. Math. Educ.*, vol. 8, no. 2, pp. 185–198, 2017, doi: 10.22342/jme.8.2.4055.185-198.

[12] S. Hardiarti, "Etnomatematika: Aplikasi Bangun Datar Segiempat Pada Candi Muaro Jambi," *Aksioma*, vol. 8, no. 2, pp. 99–110, 2017, doi: 10.26877/aks.v8i2.1707.

[13] R. Radiusman, K. S. K. Wardani, R. A. Apsari, I. Nurmawanti, and G. Gunawan, "Ethnomathematics in Balinese Traditional Dance: A Study of Angles in Hand Gestures," *J. Phys. Conf. Ser.*, vol. 1779, no. 1, 2021, doi: 10.1088/1742-6596/1779/1/012074.

[14] Haryanto, T. Nusantara, and Subanji, "Etnomatematika pada Noken Masyarakat Papua," *Semin. Nas. Mat. Dan Pendidik. Mat. Uny*, pp. 1177–1184, 2015.

[15] C. S. Ubayanti, H. Lumbantobing, and M. M. H. Manurung, "Eksplorasi Etnomatematika Pada Sero (Set-Net) : Budaya Masyarakat Kokas Fakfak Papua Barat," *J. Ilm. Mat. dan Pembelajarannya*, vol. 1, no. 2007, pp. 12–21, 2016, [Online]. Available: http://ejournal.uncen.ac.id/index.php/JIMP/article/view/213.

[16] A. J. Bishop, *Mathematical Enculturation: A Cultural Perspective On Mathematics Education*. Dordrecht, Holand: D. Reidel Publishing Company, 1988.

[17] A. Macmillan, "Children thinking mathematically beyond authoritative identities," *Math. Educ. Res. J.*, vol. 7, no. 2, pp. 111–131, 1995, doi: 10.1007/BF03217280.

[18] B. M. F. Pratama, Mardiyana, and D. R. S. Saputro, "An Analysis Of Etnomathematic Activities In The Making Process Of Tulungagung Marble," in *Proceeding MISEIC Emerging Trends of Research in Mathematics, Informatics, Science, and Education*, 2018, pp. 211–216.

[19] S. Malak, *Kapitalisasi Tanah Adat Sinergi Kepentingan Masyarakat Adat dalam Otonomi Khusus Papua*, 4th ed. Bandung: Lepsindo, 2012.

[20] Haryanto, *Politik Kain Timur: Instrumen Meraih Kekuasaan*, 1st ed. Yogyakarta: Polgov, 2015.

[21] Z. Khanafiah, "Kajian Etnomatematika Terhadap Tradisi Upacara Potong Rambut Gembel (Ruwatan) Masyarakat Kabupaten Wonosobo Dalam Rangka Penentuan Aspek-Aspek Matematis Dan Implementasinya Dalam Pembelajaran Matematika," *Hipotenusa J. Math. Soc.*, vol. 1, no. 2, pp. 1–15, 2020, doi: 10.18326/hipotenusa.v1i2.1-15.

[22] Y. Eryandi, Somakim, and Y. Hartono, "Learning materials design pattern numbers context making kemplang in class IX," *J. Math. Educ.*, vol. 7, no. 2, pp. 101–108, 2016, doi: 10.22342/jme.7.2.3535.101-108.