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Research Article

# Ethnomathematical exploration of the "ompangan" tradition of the Jember Madura community

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## ABSTRACT

Culture is closely related to the lives of Indonesian people, in the current era of technological sophistication, culture is one of the means to study science, one of which is ethnomathematics. Ethnomathematics is a branch of mathematics that uses culture as a means to deepen the knowledge and concepts of mathematics education through the role of culture in society. This study focuses on the ethnomathematical exploration of the "ompangan" tradition of the Jember Madura community in Kalisat with the aim of describing ethnomathematics in the ompangan tradition of the community and formulating the concept of mathematical calculations. This research took place at Jalan Diponegoro Dusun Krajan 1 RT/RW 012/004 Glagahwero Kalisat. This study uses a qualitative method with a descriptive approach, with data collection techniques through interviews and observations. The results showed that the ompangan culture contained mathematical concepts in it that linked culture to the mathematical counting process, namely the concept of worth comparison and a system of linear equations used to determine the number of goods with the same price or value.

**Keywords:** exploration; ethnomathematics; ompangan tradition; madura

## 1. INTRODUCTION

In the world of education mathematics is one field known science with deductive nature where position very important taught to every level education and mathematics is knowledge general which is base from sciences other. This thing in line with opinion (Nuraini et al., 2021) states that mathematics is knowledge about logic about form, arrangement , quantity , and related concepts with other . Mutual concepts related to existing in mathematics make mathematics as knowledge that can load various aspect in it. According to (Iskandar, 2021)partially Most students in Indonesia think that mathematics is a boring and scary lesson because it always contains a lot of formulas and numbers, lack of interest in mathematics is a very bad start for the world of education special in learning math. The goals of education in the 21st century are: with To do preservation and promotion culture, language, and literature through Education field. (Meral & Putri, 2022) With that , math takes role important To use increase innovation to lead students ' opinions to get out of the fear of numbers in learning mathematics. One way that can be taken to follow make the aspiration of 21st century education is to develop mathematics into concepts that are new and close to students so that it can be easily reached by students' mindsets. As we know that draft mathematics always related with activity human. The need planting draft proper math with reality in the field very needed in modern times like moment This is because mathematics is a science that requires a strong foundation to continue to a higher level, because science in mathematics is closely related among one same other.

This is in line with (Meral & Putri, 2022) said that in the age of technology, like moment this , there is many method for understand draft mathematics with a fun way that does not only fixated on numbers and formulas sheer . s wrong one branch knowledge that can our learn that is understand draft mathematics in element culture Thing the could help our as generation successor nation for understand culture nation with a learning system through math , no Becomes confidential that progress technology will impact to eroded culture local because assumption ancient , then with existence system update mathematics with draft culture could help our for u k more understand culture based on numbers , this is certainly very fun to do because as we know that our own nation has various cultures that spread from Sabang to Merauke, the diversity of tribes, ethnicities, cultures, and customs can make the planting of the same mathematical concepts with different cultural elements as said by Indah that cultural values are national characters that must be instilled from an early age so that each individual is able to understand, interpret, appreciate, and interpret the importance of cultural values in aspects of life.

Learning mathematics based on Ethnomathematics has become one of the bridges between culture and education, especially mathematics. (D'Ambrosio, 2001) states that Ethnomathematics is mathematics that is practiced among identified cultural groups, such as national tribal societies, children in certain age groups, professional classes, and so on.

Simply put, ethnomathematics is a mathematical concept that occurs in a certain group, ethnicity, ethnicity, race by studying and understanding mathematical concepts hidden in a cultural group. Tradition is a repeated habit that is carried out by a certain ethnic or ethnic group so that it creates a habit in that group so that the situation will always be carried out.

A number of research that examines ethnomathematics is one of them Research conducted by Euis Fajriyah post program bachelor degree Semarang University Mathematics Education study program, according to the research role ethnomathematics in support literacy mathematics is that ethnomathematics facilitate student for capable construct draft mathematics as part from literacy mathematics based on knowledge student about environment social culture them. Study other conducted by Adhetia Martyanti and Suhartini mathematics education study program, Alma Ata University, Yogyakarta, the study stated that learning mathematics based on ethnomathematics, where culture play a role as context shown in form problem, have relevance with indicators think critical. With thereby expected learning mathematics based on ethnomathematics could grow ability think critical participant educated, especially in finish related problems with life related daily with culture. With so many studies between culture and mathematics, of course we can become good citizens by preserving culture and can become good students and educators by understanding mathematical concepts that are implemented in a lesson. According to (Ajmain et al., 2020), mathematics education has actually been integrated with community life itself, both in the process of social interaction, building or other things.

Indonesia is a country with millions of cultures in it, as well as its regions, if we understand the many cultural processes that we can pour into the concept of mathematics, apart from being a cultural asset, several other cultures can also be used as the development of the concept of learning mathematics. Culture often functions as a means of social interaction between people so that the power of culture can still be an attraction to strengthen mathematics. one of the mathematical concepts that can be applied in the culture of the Jember community, especially the Jember Madura, the Ompangan tradition is still widely practiced in villages that still strongly adhere to the tradition. This tradition can also be bridge for understand one Theory mathematics through linking mathematical concepts where we can study the existing culture while learning mathematics, the mathematical concepts that we can learn are the concept of worth comparison which is in accordance with the definition of the ompangan tradition that has been explained and the concept of one-variable linear equation, of course this can be an interesting lesson because the target of the mathematics material in this sub-ba is class VII junior high school students, so this research can make students learn culture at an early age, and can understand mathematical concepts well. Based on the description above, researchers are interested in researching how to calculate which is done to fulfill the responsibilities of a community towards other communities who are having events. So from need did research entitled " Exploration " Ethnomathematics in Tradition Ompangan Madurese Community in Jember Especially in Kalisat ".

## 2. RESEARCH METHOD

Meanwhile, interviews will be conducted with the community, consisting of elders, people having a celebration, people who have an ompangan . In this study, data collection was carried out using interview, observation, and documentation techniques. Through this interview technique obtained data: a) how forms and procedures in To do tradition Ompangan in the Madurese community in Jember , b) the form of activity that has a mathematical nuance is owned by the properties of arithmetic operations and comparisons of value found in the process of determining goods with a price limit to be achieved which develops in the ompangan tradition of the Madurese community in Jember especially the kalisat area. In addition, documentation is also used to obtain data from official documents, regulations related to the ompangan tradition in the Jember Madura community in the Kalisat area.

Meanwhile, through observation, the data obtained are: a) the ompangan tradition process which is carried out from beginning to end, b) the ethnomathematics practiced by the Madurese community in Jember in the ompangan tradition by observing directly the calculation patterns in the omangan tradition in the Madura community in Jember, especially in the area. kalisat, c) and the activities carried out in the omangan tradition have the concept of counting operations that have developed in the community until now which is contained in the omangan tradition of the Madurese community in Kalisat Jember. Analysis of research data was carried out through a qualitative approach. Data obtained from interviews, observations and documentation, the analysis is carried out by sorting similar data and then data reduction, data presentation and conclusion drawing and verification. Data were collected based on categories such as: 1) equipment in the ompangan tradition that contains mathematical elements, 2) the process in the ompangan tradition which contains elements of mathematics, 3) measurements, how to perform arithmetic operations and so on in the ompangan tradition.

## 3. RESULTS AND DISCUSSION

### 3.1 Results

Exploration according to the Big Indonesian Dictionary (KBBI) is a field exploration with the aim of gaining more knowledge about a situation. (D'Ambrosio, 2001) describes ethnomathematics or ethnomathematics is an approach to teaching and learning mathematics that is built on students' prior knowledge, background, the role the environment plays

in terms of content and methods and past experiences and their current environment. Ethnomathematics is mathematics that is practiced among identified cultural groups, such as national tribal societies, children in certain age groups, professional classes, and so on. Ethnomathematical exploration is an exploration to find out more and more deeply related to mathematical concepts in the context of local culture. Meanwhile, tradition is the hereditary customs (from the ancestors) that are still carried out in society or judgment, the assumption that existing methods are the best and most correct.(Yulianto et al., 2019)

Ompangan is the language of Madura which means the tradition of giving goods or money at a celebration, whether it is a neighbor or relative in a big event where the assistance is not free and must be returned at the right time, namely when we who donate also have a celebration by returning the same item or different values with the same value. Ethnomathematics is a branch of mathematics that provides new ways to work on and solve mathematical concepts in a more enjoyable way. (Bayu, 2021) stated that the purpose of the existence of ethnomathematics is to recognize that there are different ways of doing mathematical solutions taking into account the academic mathematical knowledge developed by different sectors of society and taking into account the different modes in which different cultures negotiate their mathematical practice by grouping, count, measure, design, build, play and more. The mathematical indicators in this study are as follows:

### 1. Number operations

The number operations referred to here are addition, subtraction, multiplication and division operations. On operation number could used in the payment process tradition naughty where our must start count, feel, and determine about amount goods , total goods , types goods and so on.

### 2. Comparability

In this study, it will be proven that the ethnomathematics that plays a role in it also contains comparable material in mathematics learning so that the concept of arithmetic operations will be applied to the concept of comparability. In math, two variable said comparable to g or is at in connection proportionality/ proportionality, if both of them each other related through multiplication with a constant or setting. For example, if second variable the have fixed ratio or constant, then second variable the called comparable or compare straight If second variable the have constant product , then called " compared" reversed". The value of constant (ratio or the product) called coefficient proportionality or constant proportionality . In the concept of comparability in the ompangan tradition, it will be proven whether the value to be paid will be in accordance with the past value that has been given. So if occur customize so goods the will direct approved, however if no comparable with past value, then will Look for other suitable alternatives with tradition that .

### 3. Linear equation concept

In this study, it will be proven that the ompangan tradition can also be determined in the ethnomathematical process with the concept of a linear equation in order to determine the maximum amount of goods to be carried at a predetermined price. Tradition according (Kristanti et al., 2022) traditions are hereditary customs (from ancestors) that are still carried out in society or judgment, the assumption that existing methods are the best and right ways. Ompangan itself is the language of Madura which means the tradition of giving goods or money at a celebration, be it neighbors or relatives in a big event where the assistance is not free and must be returned at the right time, namely when we who donate also have a celebration by returning the same item. or different with the same value. a tradition that is commonly carried out in the Madurese community and people outside the island of Madura but is still in the mirror of Madura etiquette. This is intended to ease the burden on the host who has a celebration. The ompangan tradition which is widespread in the Jember and surrounding areas is a hereditary tradition that has been carried out for tens or even hundreds of years and is growing rapidly in the Madura ethnic region until now. Tradition this have many very benefit in life conditional tap tradition this could strengthen relationship and rope family in every society. From the interviews and observations made researcher Procedure in tradition naughty this could depicted as following.

First of all, families who have a celebration and are not able to meet their own needs, they will visit houses that they think are close, such as relatives, or relatives' houses, or neighboring houses that already have strong ties to the family that organizes the celebration. bring a gift and then convey the purpose of holding a fairly large celebration, after that the host will understand without having the guest ask the owner of the house about something that has not been fulfilled at the celebration, then the owner of the house will ask the organizer of the celebration about what is still not fulfilled at the celebration, whether in the form of money, goods, or other things related to the celebration event. Furthermore, the guest or family of the organizer of the celebration will convey and answer questions from the owner of the house or his relatives. After the deliberation process so will Approved something decision about what will brought and asked for worth how much. And no stop until there after si relatives or owner the house that was something moment will stage celebration too then si organizer first celebration must with aware self for return what have given formerly with value which and with form goods requested by the organizer new celebration. But there are some people because they reflect on a very close kinship relationship, they usually return it with more, and this is of course not a problem, but most people will calculate the value according to their debt first, then after that they return it with what they owe. they want.

From procedure ompang that has been described above, then could our conclude that ompangan also has system future debt will returned with the same value . This thing will relate with draft math and reality mathematics very sticky with life society and society that myself have also apply draft ethnomathematics only just they no got it with what are they do that that related with draft math. Example tradition Ompang could found around the Madurese community in Jember , one of which was at a wedding held by one of the subject study On name father Friday in wedding his son. Let 's say that father Friday is Variable A While the first person to do tradition tantrums at the wedding the is variable B. so will outlined implementation tradition naughty is as following ; Case this started with existence a celebration or event, on moment person A wants hold a celebration big like marriage , person A asks goods to B in the form of Rice 100 kg. Price rice moment that is Rp. 9000,- , several moment after that person B will also hold a celebration in the form of circumcision so person B asks to person A with form sugar. So from case the could determined comparison worth and system of equations. For comparison, the value of rice is 100 kg must be replaced with rice as well as 100 kg, for the host if he asks for goods in another form, it will be calculated in a simple way, namely how much person A buys the goods requested by person B which is equivalent to the goods previously given. Or with the solution at **Figure 1.**

$$diketahui = harga\ beras = Rp.\frac{9000}{kg}$$

$total\ beras = 100\ kg$

$harga\ gula = Rp.\frac{10.500}{kg}$

*ditanya ? berapa gula yang harus dibeli ?*

*ATURAN : dengan besaran nilai yang sama*

*jawab :*

$100\ kg\ .900 = 10.500.X$

$900.000 = 10.500.X$

$X = 85{,}7\ kg$

*maka gula yang harus dikembalikan adalah minimal*

*85,7 Kg tidak boleh kurang*

**Figure 1.** Solution

Draft calculation mathematics in operating indicators count that is in the process of calculating the price will be Becomes Ompangan , on the comparison indicator worth could seen in the process of calculation that items to be returned no can more with the price to be limit gift vacancies . And in the indicator system of equations one variable can seen moment our count heavy items to be made limit end in return naughty that , where in study this use variable x for determine heavy minimum goods.

## 3.2 Discussion

The results showed that the learning process based on realistic mathematical approaches developed met the criteria of valid, practical, and effective. After learning tools that are valid, practical, and effective are produced, the next goal is a learning device developed that can improve students' ability mathematical connection. The Ability Mathematical connections are one of the abilities students must possess to solve problems. (Ajmain et al., 2020) the connection of mathematics is a very important part that must be emphasized at every level of education. In line with what is said by (Hendra et al., 2020) that the ability to connect mathematics is one of the mathematical abilities that must be developed in learning mathematics in school. When students do not apply the concept of experience that they have had before, they will find it difficult to remember certain material and they will remember too many separate concepts while mathematics contains many principles. Mathematical connection is the relationship between the topic of mathematics itself, the relationship between mathematics and other scientific disciplines, and the relation of mathematics to the real world or in everyday life.

The purpose of developing learning devices in this study by using this realistic mathematical approach is to improve students' ability mathematical connection. To see the increase in ability mathematical connection in students, it will be seen based on the value of the students' pretest and posttest mathematical connection abilities. In accordance with the data analysis description of the results of the study, it was found that less than 60% of students who obtained pretest scores below the standard set of minimum completeness criteria were determined. Mathematical connection ability of low students is influenced by several factors, among others, in solving mathematical problems in the form of contextual problems students are not accustomed, problems given by students from teachers are not much different from the examples previously taught, and students learn by memorizing mathematical ideas in solve math problems, so students are not familiar with the non-routine questions given. Based on this, it becomes an effect for students having difficulty in connecting mathematical ideas themselves, mathematics with other fields of science, and mathematics with everyday life.

As said (Bayu, 2021; Karimullah & Masyhudi, 2022; Kristanti et al., 2022) that the low ability mathematical connection of students in learning mathematics is caused by several factors, one of which is because students are not able to associate mathematical ideas that have been taught and new mathematical ideas taught. This phenomenon occurs because often students memorize mathematical ideas without trying to interpret the ideas contained in the problem given. Learning is said to be meaningful if the information learned by students is prepared in the appropriate cognitive structure so that students have strong memories and transfer of learning is easily achieved. Therefore, to improve ability mathematical connection a learning device is needed that is able to link mathematical ideas and meaningful learning to occur. This is consistent with realistic mathematical characteristics that use student contributions so that it emphasizes meaningful learning. By using contributions students can construct their own knowledge that they already have with their new knowledge in solving mathematical problems. The results of this study indicate that students' ability mathematical connection increase with realistic mathematical learning tools. The increase can be seen from the posttest results of the ability mathematical connection obtained by students.

In accordance with the N-Gain calculation to see an increase in students' ability mathematical connection, an increase in the pre-test to post-test value with a n-gaint value of 0.71 was interpreted as in the "medium" category. Students' ability mathematical connection also increases seen in each indicator of ability mathematical connection which consists of indicators of mathematical connections between mathematical topics, connections between mathematical topics and other fields of science and connections between mathematics and everyday life. The ability mathematical connection increases because realistic mathematics learning tools applied in learning have met valid, practical, and effective criteria. With realistic mathematical learning devices students will be accustomed to solving non-routine mathematical problems, problems that are given close in the daily lives of students, with that students will not feel bored in the learning process. This realistic mathematical learning tool will also train students to solve problems by finding procedures from ideas found by students. then students will be directed in linking mathematical ideas learned before in solving problems, with this the learning process will take place more meaningfully. The learning process of mathematics by using realistic mathematical approaches can improve students' ability mathematical connection. This is because learning scenarios using realistic mathematical approaches are designed to contain contextual realistic problems close to the lives of students, so the process of solving problems done by students goes well and activates students to rediscover the concept of learning through mathematical modeling activities. the learning process by using realistic mathematical approaches with student contributions makes students more active, produce and provide meaningful learning experiences through the formation of interrelated concepts so as to improve students' ability mathematical connection.

## 4. CONCLUSION

The ompangan tradition is a Maduranese tradition that is still widely applied in society today, the omangan tradition is a tradition that contains mathematical concepts in it. Mathematical concepts that can be found in the ompangan tradition include the concepts of arithmetic operations, systems of equations and comparisons of worth. This combination of ompangan tradition and mathematics is expected to become a more fun and easy means of learning mathematics by developing mathematics in the concept of local culture which is closely related to the surrounding environment so that mathematics learning can be of higher quality in the world of education . The hope is that the ompangan tradition can be a means of channeling mathematics learning so that it can maximize its usefulness in the development of science and technology. And hopefully this article can be a reference and help other researchers to explore mathematics more in the surrounding culture. And based on the results of the research and discussion that have been described previously, the following conclusions can be drawn; 1). Various forms of community tradition, especially in the ompangan tradition of the Madurese community in Jember in the Kalisat area, precisely on Jalan Diponegoro, Dusun Krajan 1 RT/RW 012/004 have mathematical concepts in the process which include the concepts of arithmetic operations, value comparisons, and equations in determining the shape of the ompangs to be used. Given, 2). Some of the potential of ethnomathematics in the Madura community in Jember as new knowledge that contributes to understanding mathematical concepts.

## AUTHOR'S CONTRIBUTIONS

The authors discussed the results and contributed to from the start to final manuscript.

## CONFLICT OF INTEREST

There are no conflicts of interest declared by the authors.

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