INDONESIAN JOURNAL OF SCIENCE AND MATHEMATICS EDUCATION
06 (2) (2023) 213-226
https://ejournal.radenintan.ac.id/index.php/IJSME/index
ISSN: 2615-8639
DOI: 10.24042/ijsme.v5i1.17182
July 2023

ETHNOMATHEMATICS EXPLORATION OF FISH TRADER ACTIVITIES IN THE TRADITIONAL MARKET OF PUNGGULAN VILLAGE, ASAHAN REGENCY

Rini Angraini[1*], Fibri Rakhmawati[2]
[1,2]Department of Mathematics Education, Faculty of Tarbiyah and Teacher Training, Universitas Islam Negeri Sumatera Utara, Indonesian

**Corresponding author:* riniangraini267@gmail.com

Article Info

Article history:

Received: June 6, 2023
Accepted: July 21, 2023
Published: July 23, 2023

Keywords:

Ethnomathematics
Fish trader activities
Traditional market

ABSTRACT

This study aims to explore the activities of fish traders in traditional markets by connecting mathematics and culture, known as ethnomathematics. The type of research used is qualitative research with an ethnographic approach. Data collection techniques used are library data, observation, and interviews. The data analysis technique refers to the Miles and Huberman model: data reduction, data presentation, and conclusion. This study found that the activities of fish traders in traditional markets were grouped into three processes: measurement, packaging, and buying and selling. The concepts found in these three activities are measurement, sets, one-variable linear equations, weight comparisons, social arithmetic, relations and functions, two-variable linear equations, flat-sided spaces, and probability. Thus, the activities of fish traders contain ethnomathematics elements which are simultaneously an application of mathematical theory learned at school. Further researchers are advised to examine the quality of ethnomathematics-based mathematics learning.

ETNOMATEMATIKA AKTIVITAS PEDAGANG IKAN DI PASAR TRADISIONAL DESA PUNGGULAN KABUPATEN ASAHAN

Kata Kunci:

Etnomatematika
Aktivitas pedagang ikan
Pasar tradisional

ABSTRAK

Penelitian ini bertujuan mengekplorasi aktivitas pedagang ikan di pasar tradisional dengan menghubungkan matematika dan budaya, yang dikenal sebagai etnomatematika. Jenis penelitian yang digunakan adalah penelitian kualitatif dengan pendekatan etnografi. Teknik pengumpulan data yang digunakan yaitu data pustaka, observasi, dan wawancara. Teknik analisis data mengacu pada model Miles dan Huberman yaitu reduksi data, penyajian data, dan penarikan kesimpulan. Hasil penelitian ini ditemukan aktivitas pedagang ikan di pasar tradisional dikelompokkan menjadi tiga proses yaitu pengukuran, pengemasan, dan jual-beli. Konsep yang ditemukan pada tiga kegiatan tersebut yaitu pengukuran, himpunan, persamaan linear satu variabel, perbandingan berat, aritmatika sosial, relasi dan fungsi, persamaan linear dua variabel, bangun ruang sisi datar, dan peluang. Dengan demikian, kegiatan pedagang ikan mengandung unsur etnomatematika yang sekaligus merupakan aplikasi teori matematika yang dipelajari di sekolah. Peneliti selanjutnya disarankan meneliti kualitas pembelajaran matematika berbasis etnomatematika.

© 2023 Unit Riset dan Publikasi Ilmiah FTK UIN Raden Intan Lampung

1. INTRODUCTION

Education is a foundation for developing quality human resources [1]. Education in schools has a curriculum that includes several subject matters, including mathematics. Mathematics is a tool that can help other sciences solve various problems and is also needed in everyday life. Therefore, mathematics is very important in advancing quality human resources so that everyone can overcome problems that arise. In this case, mastery of concepts in mathematics that are learned early is needed. Mathematics can grow and develop because of the difficulties faced by people in various regions with different cultural backgrounds, and they develop mathematics uniquely [2]. Mathematics is a universal science that can be applied in other fields of science, especially in everyday life [3]. Thus, mathematics grows and develops from the results of the human mind in daily life activities, so it can be said that mathematics is a cultural product of human thought as a problem-solving tool.

The relationship between mathematics and culture is known as ethnomathematics. Ethnomathematics is a special method used by certain groups of people to carry out their activities, such as grouping, sorting, counting, and measuring [4]. Ethnomathematics is born from culture, but people do not realize that mathematics has been used in its activities. Therefore, it should be pointed out that society has become familiar with mathematical concepts in real life [5]. In reality, human activities are mathematical activities as well [6]. Ethnomathematics is important as a learning medium for teachers and students. In line with the research results [1], the concept of mathematics found in community activities becomes a positive means for teachers. It opens students' insights that mathematics is always related to life in various activities.

In the school, the mathematics curriculum should be related to culture so that students can gain knowledge and understanding following cultural practices that they know from an early age, where the current government policy has implemented an independent curriculum. In the context of learning recovery, the Merdeka Curriculum emphasizes essential content so that students can deepen concepts and strengthen literacy and numeracy skills through project-based differentiated learning to realize the profile of Pancasila students [7]. An independent curriculum should be centered on students, teachers, and schools to be free to innovate, learn independently and creatively to determine appropriate learning for student development and characteristics.

In reality, mathematics learning in schools is often presented formally and looks much different from what students find in their daily lives [8]. This is because teachers' learning strategy is a conventional method centered on reference books whose context is still far from the student's experience. The method used by the teacher is one of the causes of students not innovating, independent, creative, and active in the teaching-learning process because students are less given the opportunity to discuss with their group mates and also lack the opportunity to express student opinions as a reflection of learning outcomes because the method is centered on learning books. This results in students feeling bored and perceiving mathematics as a difficult, complicated, formulaic, and useless science [9].

In previous studies, community activities contained ethnomathematics, including the activities of rice farmers in Karawang [10]. The activities of rice farmers in daily activities use mathematical concepts to calculate the area of rice fields, measure the length and width of rice fields, determine the distance between rice seeds, and calculate the required rice seeds according to the area of rice fields. Activities carried out by rice farmers in Karawang are related to ethnomathematical abilities that need to be maintained and socialized by formal educators. In line with research conducted on farmer activities in Indramayu [11]. In carrying out its activities, the Indramayu farming community uses mathematical concepts such as grouping, measuring, numbering, and comparison. In addition, research conducted on ethnomathematics in stringing beads in the Dayak Kapuas Hulu community found that the elements of stringing beads are related to mathematical concepts in how to say the calculation of the beads contains the concept of numbering, the pattern of images contains the concept of squares (flat-side figure), the color grouping of beads contains the concept of set and the economic value contains the concept of social arithmetic [2]. Other research on community activities related to ethnomathematics is activities in the Tidung tribal wedding tradition [12]. In the ritual activities of *pupuran / pupuran* and *bejiu bride* (bridal bath), practice the mathematical concept of counting.

Based on the description above, mathematics learning needs to be linked to the culture of the surrounding community so that students can broaden their horizons and learn to count more effectively because it is directly related to the culture, which is their daily activity or movement. One way is to explore mathematical activities in society [13]. This aligns with the explanation [14] that exploring mathematics is one of the disciplines that provides broad and useful insights related to mathematics learning, with exploration activities that can support or explore students' ability to understand mathematical concepts that occur in reality in society. Of course, through this research, it will be able to provide a positive effort for students at school.

Therefore, researchers are interested in exploring ethnomathematics on the activities of fish traders in the Punggulan Traditional Market of Asahan Regency. The mathematical activity in question is an activity in the measurement, packaging, and buying and selling processes between fish traders and buyers. Mathematics learning needs to be linked to the surrounding culture so that students' insights will be wider. Also, students will be easier to learn mathematics because it is directly related to the culture, which is their daily activity [15]. One way is to explore mathematical activities carried out by traders in Traditional Markets. Consequently, in this study, the exploration of mathematics revealed by researchers is more focused on applying mathematics in everyday life so that students can directly and tangibly understand mathematical concepts through an activity or application [16]. The exploration results of this research can be used as additional material in studying mathematics contextually with the help of fish trader activities in the traditional market of Punggulan Village, Asahan Regency.

Research related to ethnomathematics exploration that has been done before is ethnomathematics studies on farmer activities [1], ethnomathematics assembling beads of the Dayak Kayaan community [2], ethnomathematics in balai ada Malay [3], ethnomathematics in the process of making tempe [6], ethnomathematics in community activities [5], ethnomathematics in the Tidung tribal wedding tradition [12], ethnomathematics in traditional markets [15]. However, no ethnomathematics research focuses on exploring the activities of fish traders in traditional markets. Where in the previous research explored a fairly wide area covering activities in traditional markets, while in this study, the researchers focused on the activities of fish traders in the traditional market of the village of Punggulan Asahan district so that this study explored the uniqueness and traditions of the community in trading fish. The purpose of this research is to explore the ethnomathematics of the activities of fish traders in the traditional market of Punggulan village, Asahan district. The researcher focuses on fish trading, which uses a unique way of applying mathematics. This ethnomathematics research is expected to simplify learning mathematics because it is close to real-world situations.

2. METHOD

The type of research used is qualitative research with an ethnographic approach. Qualitative research is a systematic study of parts and phenomena and their relationships that aims to find and know a symptom or event (concept or problem) by reviewing the phenomenon [17]. At the same time, the ethnographic approach is an empirical and theoretical approach to describe and analyze deeply culture based on intensive fieldwork [18].

The data collection techniques carried out by researchers are library data, observation, and interviews [16]. Literature data is obtained from various literature theories such as books, journals, and research related to community activities. Observation by observing the activities carried out by fish traders directly or through literature. At the same time, interviews were conducted with four fish traders and four buyers. The traders have more than 15 years of experience. This research was carried out at the Punggulan Village Traditional Market, which is addressed Jl. Syech Silau Laut Punggulan Village, Asahan Regency.

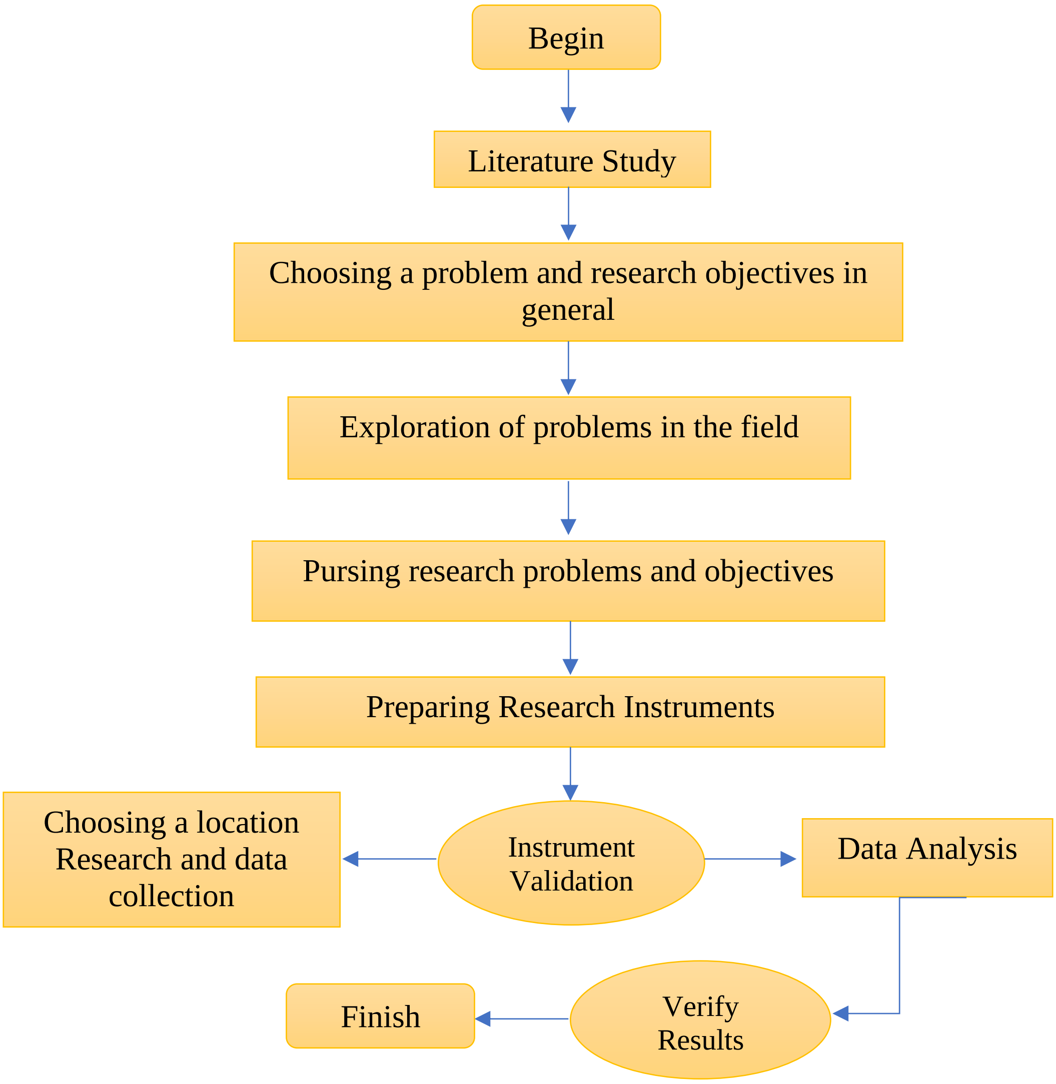

Figure 1. Research Flow

Data analysis techniques using Miles and Huberman data analysis are data reduction, data presentation, and conclusion drawing [19]. Data reduction is obtained from summarizing, choosing the main points, focusing on things that are considered important, looking for themes and patterns, and removing those that are considered unnecessary from notes written in the field [20]. At the data reduction stage, images and recordings (audio documentation) will be changed to selected writing. The presentation of data is a collection of information arranged to provide conclusions and action-taking, which will be compiled in the form of narrative text and/or tables to explain mathematical concepts in fish trader activities. Researchers conclude by following the information obtained during the study [19]. The stages of the research are presented in Figure 1 [21].

3. RESULTS AND DISCUSSION

The activities carried out by fish traders in their daily lives in traditional markets are based on experiences gained by ancestors that are passed down from generation to generation. The activities or activities of fish traders in it have several processes or stages. The data from this research is then divided into several processes: measurement, packaging, and buying and selling.

3.1 Measurement Process

Measurement is the initial stage carried out by fish traders before starting their business. Measurement is the determination of magnitude, dimensions, or capacity, usually against a standard or a measurement. In the measurement process, there is a measuring activity. Measuring is an activity that is usually carried out in the process of buying and selling or bartering, designing buildings, and determining height, length, circumference, area, depth, speed, and so on [22]. Measurements made by the people of Punggulan village in ancient times used non-standard measuring instruments such as the use of limbs, namely hands, fathoms, and inches, or using measuring instruments in the form of pieces of wood to measure length and volume. Units of measurement include units of fathom, cubit, inch, feet, cans, etc. Measuring activities carried out by fish traders are measuring fish boxes or boxes as fish containers. To measure the fish box assisted by a measuring instrument, which is an inch. There are also blocks of ice that can be measured to determine the amount of ice used for fish. Ethnomathematics found in the measurement process are below [23].

1. The concept of linear equations is one variable. Some people calculate the length of an object with measuring instruments in inches. From the data obtained from S1, the box size is 3 inches long, the S2 box size is 3.5 inches, the S3 box size is 4 inches, and the S4 box is 3 inches. Meanwhile, if measured by a roll meter, the length of the fish box is 68,5 cm. So we can find the length of 1 inch of a fish trader’s hand in centimeters with the concept of a one-variable linear equation. These mathematical concepts are contained in class VII materials.

Table 1. The Concept of a One-Variable Linear Equation

Inch size S1	Inch Size S2	Inch Size S4	Inch Size 41
$3x = 68{,}5$	$3x = 68{,}5$	$4x = 68{,}5$	$3x = 68{,}5$
$x = 22{,}8$	$x = 19{,}6$	$x = 17{,}125$	$x = 22{,}8$

2. The concept of comparison can be found in the size of the box with a length of 68.5 cm, a width of 41.5 cm, and a height of 45 cm with a capacity of 120 kg and a smaller box size with a length of 69 cm, a width of 36 cm and a height of 27 cm with a

capacity of 50 kg of fish. So the weight ratio of the fish box to the fish box is 120: 50. These mathematical concepts are contained in class VII material.

3. The three-dimensional figure, namely fish boxes and block-shaped ice chunks, can be calculated in area and volume. The size of fish boxes and ice chunks varies depending on the fish trader's needs. From the data obtained by the author that fish traders in the traditional market of Punggulan village use box sizes with a length of 68.5 cm, a width of 41.5 cm, and a height of 45 cm and a smaller box size with a length of 69 cm, a width of 36 cm and a height of 27 cm. As for the size of the ice chunks used, the length is 1 cm, the width is 3cm, and the height is 7 cm. These mathematical concepts are contained in class VIII material.

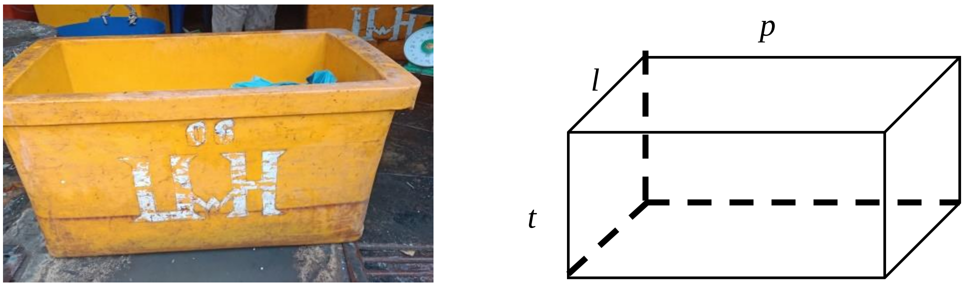

Figure 2. Fish Box

Box Surface Area $= 2(pl + pt + lt)$

$= 2(68{,}5 \times 41{,}5 + 68{,}5 \times 45 + 41{,}5 \times 45)$

$= 2(2.842{,}75 + 3.082{,}5 + 1.867{,}5)$

$= 2(7.792{,}75)$

$= 15.585{,}5\ cm^2$

Volume Box $= p \times l \times t$

$= 68{,}5 \times 41{,}5 \times 45$

$= 127.923{,}75 cm^3$

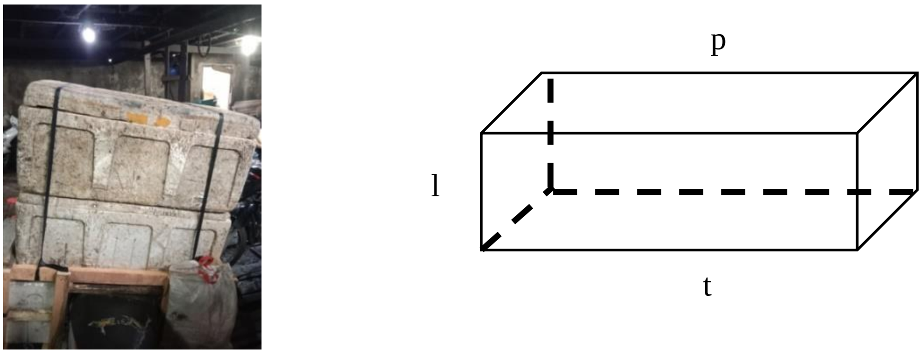

Figure 3. Fish Box Size

Surface Area of Fish Box $= 2(pl + pt + lt)$

$= 2(69 \times 36 + 69 \times 27 + 36 \times 27)$

$= 2(2.484 + 1.863 + 972)$

$= 2(5.319)$

$= 10.638\ cm^2$

Fish Box Volume $= p \times l \times t$

$= 69 \times 36 \times 27$

$= 67.068\ cm^3$

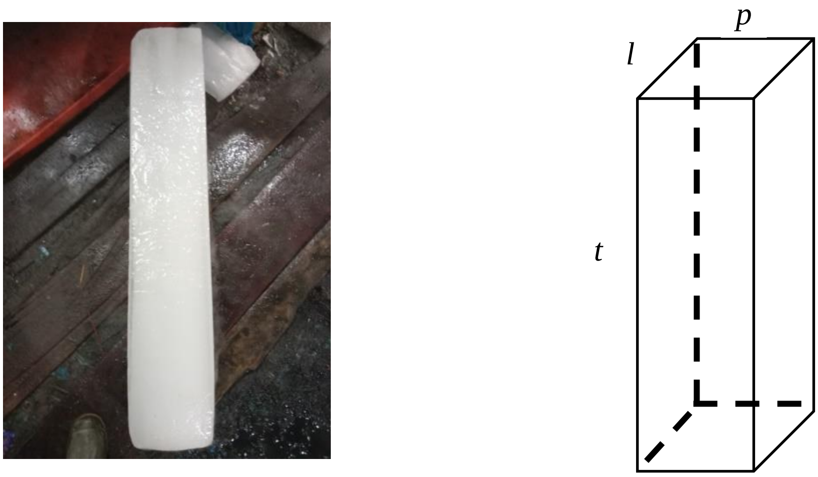

Figure 4. Ice Chunks

$$\begin{aligned}
\text{Ice Surface Area} &= 2(pl + pt + lt)\\
&= 2(1\times 3 + 1\times 7 + 3\times 7)\\
&= 2(3 + 7 + 21)\\
&= 2(31)\\
&= 62\ cm^2
\end{aligned}$$

$$\begin{aligned}
\text{Ice volume} &= p\times l\times t\\
&= 1\ \times 3\times 7\\
&= 21\ cm^3
\end{aligned}$$

3.2 Packaging Process

Packaging goods is a technique where traders prepare their merchandise before buying and selling transactions [15]. In packaging fish, there is an activity to group fish species.

Figure 5. School of Fish

Based on the results of interviews and observations with subjects, it is known that the way to pack fish before starting to sell is by paying attention to the type of fish. Any fish that have the same type will be collected. This is done to facilitate traders and buyers in buying and selling fish. The types of fish traded are quite numerous. The ethnomathematics found in the packaging process is below [24].

1. In the group concept, the fish will be stacked in small tampah. If the type of fish traded is swordfish, then the number of cob fish in one stack is five large fish. If what is traded is cencaru fish, then the number of cencaru fish in one stack is 15 for medium-sized and 7 for large-sized ones. If the manyung fish are traded, the number

of fish stacked is three heads with large sizes, and if the stingrays are traded, the number of fish stacked is 5 or 6 large fish. These mathematical concepts are contained in class VII material.
2. The concept of social arithmetic regarding the net. The net weight for one large swordfish is 1 kg, the net weight for one medium-sized cencaru fish is 2.5 ounces, the net weight for one large manyung fish is 7 ounces, and the net weight for one stingray is 3 ounces. These mathematical concepts are contained in class VII material. Here's the activity of grouping fish.

3.3 Trading Process

There are numerical activities and counting activities in the process of buying and selling. In buying and selling, various calculations are usually in addition, subtraction, multiplication, and division. These calculations are the basics of counting in mathematical solutions or mathematical terms referred to as arithmetic [20].

The regional language used in communicating is Javanese because most of the population is Javanese. This regional language created numerical activities for Javanese people in Punggulan village. Ethnomathematics numerical activities found in Javanese society in Punggulan village are as follows.

1. In the concept of the place value of a number, the people of Punggulan village tend to ignore the number 0 as thousands, tens of thousands, or hundreds of thousands. Punggulan villagers tend to pronounce 0,1,2,3...,9 as thousands. 10,11,12,13,....,99 for tens of thousands. While 100,101,102,103,...,999 as hundreds of thousands. This is interesting to learn because we can know the place value of a number. Such mathematical concepts can be found in class VII materials.

Table 2. Activity Numerating Place Values of Numbers

True Value	Javanese Pronunciation	Place Value Number
1.000	1	Thousands
10.000	10	Tens of Thousands
100.000	100	Hundred Thousand

2. The concept of social arithmetic regarding the net is in mentioning 1 kg by the addition of the words *‘’se’’* and kilo. For the mention of 2,3,4,5,7,8,9 kg, namely the addition of Javanese to the numbers 2,3,4,5,7,8,9 plus the words *ng* and *kilo*. As for the mention of 6 kg and 9 kg, namely the addition of the words enem and sanga plus the word *kilo*. Then for the mention of tens of kilograms, add Javanese 1 to 9 plus the word *las*. Such mathematical concepts can be found in class VII materials.

Table 3. Activity Numerating Weight units

Local Language Unit Weight	Weight Unit Conversion in Mathematics
Sekilo	1 Kg
Rong kilo	2 Kg
Telung kilo	3 Kg
Patang kilo	4 Kg
Limang kilo	5 Kg
Enem kilo	6 Kg
Pitung kilo	7 Kg
Wolung kilo	8 Kg
Sangang kilo	9 Kg
Sepuluh kilo	10 Kg
Sebelas kilo	11 Kg
Ronglas kilo	12 Kg

As for counting activities, several mathematical concepts were found, as follows.

1. The concept of social arithmetic is about profit. Traders buy fish to fishermen as much as 100 kg. Types of fish include 20kg of cencaru fish for Rp. 24,000/kg, 20 kg of mackerel for Rp. 32,000/kg, ten rays for Rp. 40,000/kg, 15 kg of ogak fish (klotok) for Rp. 23,000/kg, grapu fish for Rp. 38,000/kg, 20 kg swordfish for Rp. 34,000/kg and 7 kg of squid for Rp. 41,000/kg. Then the trader will resell the fish at a price of cencaru fish Rp. 28,000 / per kilo, mackerel for Rp. 36,000 /kg, rays for Rp. 44,000 /kg, ogak fish for Rp. 26,000 /kg, grapu fish for Rp. 45,0000 /kg, mackerel for Rp. 38,000 /kg, and squid for Rp. 48,000/kg. We can calculate the start-up capital and profits of the fish merchant earned. Such mathematical concepts can be found in class VII materials.
   Calculate the initial capital of a fish trader can be done in the following way:
   Initial Capital = (20 x 24.000) + (20 x 32.000) + (10 x 40.000) + (15 x 23.000) + (8 x 38.000) + (20 x 34.000) + (7 x 41.000
   $= 480.000 + 640.000 + 400.000 + 345.000 + 304.000 + 680.000 + 287.000$
   $= Rp. 3.136.000$
   Sales Price $= (20 \times 28.000) + (20 \times 36.000) + (10 \times 44.000) + (15 \times 26.000) + (8 \times 45.000) + (20 \times 38.000) + (7 \times 48.000)$
   $= 560.000 + 720.000 + 440.000 + 390.0000 + 360.000 + 760.000 + 336.000$
   $= Rp. 3.566.000$
   Profit Gains = Sales price – initial capital
   $= Rp. 3.566.000 - Rp. 3.136.000$
   $= Rp. 430.000$

Figure 6. Kilos of Fish

2. The concept of relations and functions. From interview data and direct observation, it is known that the most preferred type of fish is mackerel. In addition, there are also fish prices that are the same price, namely mackerel and mackerel Rp. 32,000 / kilo. Such mathematical concepts can be found in class VIII materials. It can be described in terms of relationships and functions with arrow charts.

The most preferred fish

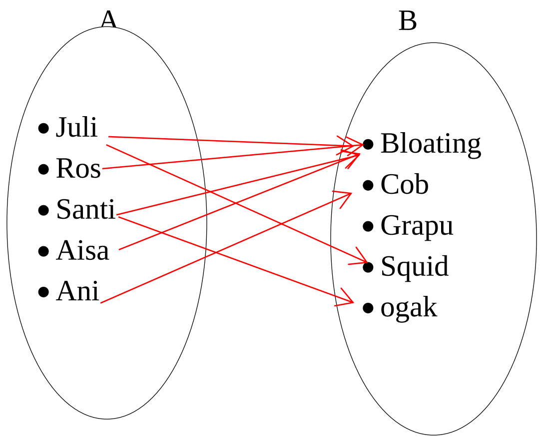

Figure 7. Relationships and not Functions

Fish Price

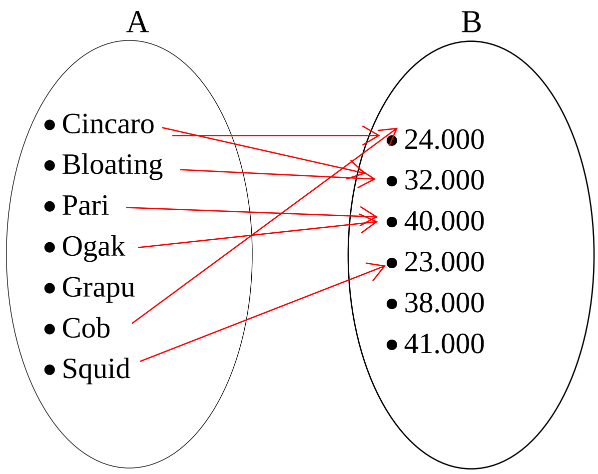

Figure 8. Relationships and Functions

3. A two-variable linear equation system is when a consumer named Ros buys kg of mackerel and 23 kg of ogak fish (klotok) at Rp 133,000. At the same time, Santi buys 2.5 kg of mackerel and 2 kg of ogak fish (klotok) at a total price of Rp 26,000. Using a two-variable linear equation system, we can calculate the price of 1 kg of mackerel and 1 kg of ogak fish (klotok). These mathematical concepts can be found in class VIII material.

   Suppose:
   The price of 1 kg of mackerel $= x$, and the Price of 1 kg of ogak fish $= y$
   Mathematical model
   $2x + 3y = 133.000$ (1)
   $2{,}5x + 2y = 126.000$ (2)
   Elimination of equations (1) and (2) Retrieved:
   $2x + 3y = 133.000 |\times 2| \quad 4x + 6y = 266.000$
   $2{,}5x + 2y = 126.000 |\times 3| \quad 7{,}5x + 6y = 378.000$
   $-3{,}5x = -112.000$
   $x = 32.000$

Then substitute the equation (1)

$$2x + 3y = 133.000$$
$$2(32.000) + 3y = 133.000$$
$$64.0000 + 3y = 133.000$$
$$3y = 133.000 - 64.000$$
$$3y = 69.000$$
$$y = 23.000$$

Therefore, the price of 1 kg of mackerel is $Rp. 32.000$, and 1 kg Ogak fish (klotok) is $Rp. 23.000$

4. The concept of opportunity. Fish traders can sell marine fish for 120 kg/day. So from 120 kg/day, the opportunity for fish traders to successfully sell fish is 120/120=1. If fish traders experience problems with their trades, namely when the price of chicken and carp falls, the chances of traders succeeding in selling fish are at most 100 kg/day and at least 60 kg/day. These mathematical concepts can be found in class VIII material.

From the explanation above, it is known that there are fish trader activities, namely measuring, grouping activities, numerical activities, and counting activities carried out by traders in the Punggulan Village Traditional Market. Where the activity of grouping is the activity of collecting goods based on their type, while the activity of counting is an activity that is often found in several mathematical concepts such as translation, subtraction, multiplication, and division, and numerical activities related to the form of the question "how much." The elements that make up numerical activities can traditionally use sticks, leaves, stones, or other natural materials [21]. Punggulan village fish trader activities can be applied to mathematics learning materials for junior high school level. This can be seen from the junior high school mathematical concepts found in the activities of Punggulan village fish traders, which can be related to mathematical material starting from set theory, one-variable linear equations, weight comparisons, social arithmetic, relations, and functions, two-variable linear equations, building flat side spaces, and opportunities.

Applying ethnomathematics to the activities of traditional market fish traders in Punggul village as teaching materials can provide convenience in determining more creative and quality mathematics learning methods. Ethnomathematics is the process of extracting information mathematically through the sense of sight of an activity or event that occurs in life in reality. Therefore, this research can provide information related to the relationship of ethnomathematics with more effective and quality learning methods that connect student observations to the surroundings, namely learning methods outside the classroom. The learning method outside the classroom is an outdoor learning activity is learning activity to get new things and new enthusiasm and hone students' abilities and understanding. Outdoor learning provides a lot of space for students to recognize the object of study directly and feel happy when carrying out learning activities that affect student understanding. Therefore, exploring ethnomathematics in the activities of traditional market fish traders certainly provides the main euphoria in building good responsibility in learning mathematics. A reflection of learning outside the classroom will provide a broader and more diverse understanding of mathematics learning so that students will better understand the true nature of mathematics [27]. The results showed that as many as 27.24% of 135 respondents stated that mathematics is a difficult subject [28]. The teacher's job is to create fun and meaningful learning so students can love maths. In line with the results of research conducted at SMP Negeri 5 Bengkulu City, it was obtained that students' mathematical cognition increased after implementing Bengkulu ethnomathematics-based mathematics learning [29]. Therefore, ethnomathematics can be used by teachers in conducting effective and fun learning and increasing students' love for their own culture [30]. Ethnomathematics is a scientific discipline in forming cognitive, affective, and psychomotor knowledge about the relationship between culture and mathematics. Students will be introduced to mathematics learning with the concept of life culture. Students will realize the understanding of mathematics in real and reality. So that with ethnomathematics research, teachers will find it easier to provide a good understanding of mathematics to students, teachers will have no difficulty delivering learning material in the classroom, teachers will be more rational in developing new thoughts and ideas in creating more quality material exposure such as social arithmetic material [4].

4. CONCLUSION

Ethnomathematics contained in the activities of fish traders in traditional markets is grouped into three processes: the measurement process, the packaging process, and buying and selling process. The mathematical concepts in the three processes are the concept of measurement, the concept of sets, the concept of one-variable linear equations, the concept of weight comparison, the concept of social arithmetic, the concept of relations and functions, the concept of two-variable linear equations, the concept of building flat side spaces, and the concept of chance.

Based on mathematical concepts, fish trader activities is a theoretical application of mathematics learned in school. The activities of fish traders in traditional markets can show a real relationship between mathematics in theory and practice. Mathematical concepts found in the activities of fish traders in traditional markets can be used as one of the teaching materials in schools in mathematics subjects.

REFERENCES

[1] B. A. Firdaus, S. A. Widodo, I. Taufiq, and M. Irfan, “Studi Etnomatematika: Aktivitas Petani Padi Dusun Panggang,” *J. Deriv. J. Mat. dan Pendidik. Mat.*, vol. 7, no. 2, pp. 85–92, 2020.

[2] A. Haran, A. Hartoyo, and S. Sayu, “Etnomatematika Dalam Merangkai Manik Masyarakat Dayak Kayaan Kapuas Hulu,” *J. Pendidik. dan Pembelajaran Khatulistiwa*, vol. 8, no. 3, pp. 1–8, 2019.

[3] K. Khairunnisa, S. Salamah, and B. Ginting, “Eksplorasi Etnomatematika pada Balai Adat Melayu,” *J. Pendidik. Mat. Raflesia*, vol. 7, no. 1, pp. 1–12, 2022.

[4] S. Sarwoedi, D. O. Marinka, P. Febriani, and I. N. Wirne, “Efektifitas etnomatematika dalam meningkatkan kemampuan pemahaman matematika siswa,” *J. Pendidik. Mat. Raflesia*, vol. 3, no. 2, pp. 171–176, 2018.

[5] W. Wahyudi and A. Putra, “Systematics Literature Review: Eksplorasi Etnomatematika Pada Aktivitas Masyarakat,” *J. Lebesgue J. Ilm. Pendidik. Mat. Mat. dan Stat.*, vol. 3, no. 1, pp. 173–185, 2022.

[6] S. A. Harahap and F. Rakhmawati, “Etnomatematika dalam Proses Pembuatan Tempe,” *J. Cendekia J. Pendidik. Mat.*, vol. 6, no. 2, pp. 1291–1300, 2022.

[7] A. Hartoyo and D. Rahmadayanti, “Potret Kurikulum Merdeka, Wujud Merdeka Belajar di Sekolah Dasar,” *J. Basicedu*, vol. 5, no. 4, pp. 2247–2255, 2022.

[8] R. Rivalina and S. Siahaan, “Pemanfaatan Tik Dalam Pembelajaran: Kearah Pembelajaran Berpusat Pada Peserta Didik,” *J. Teknodik*, vol. 24, no. 1,pp. 73–87, 2020.

[9] N. Nurjannah, N. Nurhaliza, E. Irmawati, and A. A. Ismunandar, “Pembelajaran matematika berbasis etnomatika Di Taman Purbakala Batu Pake Gojeng Kabupaten sinjai,” *mega J. Pendidik. Mat.*, vol. 1, no. 2, pp. 62–74, 2020.
[10] I. N. Aini, “Etnomatematika : Matematika dalam Kehidupan Petani di Kabupaten Karawang,” *Teorema*, vol. 2, no. 2, pp. 101-106, 2018.
[11] F. L. Dawati, and A. Iswandi, “Eksplorasi Etnomatematika pada Masyarakat Desa Jambe Kecamatan Kertasmaya,” *Pros. Semin. Mat. dan Sains*, vol. I, no. 1, pp. 306–309, 2019.
[12] A. Azriah, J. Jailani, H. Herison, and E. Julianingsih, “Konsep Matematika Pada Tradisi Pernikahan Suku Tidung,” *AKSIOMA J. Progr. Stud. Pendidik. Mat.*, vol. 11, no. 3, pp. 2044-2058, 2022.
[13] I. Muyassaroh and P. Dewi, “Etnomatematika: Strategi Melahirkan Generasi Literat Matematika Melalui Budaya Lokal Yogyakarta,” *J. Dikoda*, vol. 2, no. 1, pp. 1–12, 2021.
[14] D. Y. Aditya, “Eksplorasi Unsur Matematika Dalam Kebudayaan,” *Formatif : Jurnal Ilmiah Pendidikan MIPA,* vol. 7, no. 3, pp. 253–261, 2017.
[15] D. Kou, S. Nahak, and O. Mamoh, “Eksplorasi Aktivitas Etnomatematika Di Pasar Tradisional Noemuti Kabupaten Timor Tengah Utara (Ttu),” *RANGE J. Pendidik. Mat.*, vol. 3, no. 1, pp. 77–88, 2021.
[16] H. S. Iswara, F. Ahmadi, and D. D. Ary, “Implementasi Etnomatematika pada Kurikulum Merdeka Melalui Hibriditas Budaya di Kota Semarang,” *Pros. Semin. Nas. Pascasarj.*, vol. V, no. 1, pp. 447–453, 2022.
[17] I. Imron, “Analisa Pengaruh Kualitas Produk Terhadap Kepuasan Konsumen Menggunakan Metode Kuantitatif Pada CV . Meubele Berkah Tangerang,” *IJSE : Indonesian Journal on Software Engineering,* vol. 5, no. 1, pp. 19–28, 2019.
[18] H. E. Rudyanto, “Etnomatematika Budaya Jawa : Inovasi Pembelajaran Matematika Di Sekolah Dasar,” *J. Bid. Pendidik. Dasar*, vol. 3, no. 2, pp. 25–32, 2019.
[19] A. Rijali, “Analisis Data Kualitatif,” *Alhadharah J. Ilmu Dakwah*, vol. 17, no. 33, pp. 81-95, 2019
[20] M. R. Fadli, “Memahami desain metode penelitian kualitatif,” *Humanika,* vol. 21, no. 1, pp. 33–54, 2021.
[21] U. Mahmudah and S. Arif, “Etnomatematika Sebagai Inovasi Pembelajaran dalam Mengintegrasikan Nilai Kearifan Lokal dan Konsep Matematika untuk Meningkatkan Hasil Belajar Siswa Madrasah Ibtidaiyah,” *Cakrawala J. Manaj. Pendidik. Islam dan Stud. Sos.*, vol. 6, no. 2, pp. 173–183, 2022.
[22] R. Rakhmawati, “Aktivitas Matematika Berbasis Budaya pada Masyarakat Lampung,” *Al-Jabar J. Pendidik. Mat.*, vol. 7, no. 2, pp. 221–230, 2016.
[23] A. P. Putra and D. Prasetyo, “Peran Etnomatematika Dalam Konsep Dasar Pembelajaran Matematika,” *Intersections*, vol. 7, no. 2, pp. 1–9, 2022.
[24] R. Rahayu and R. Ismawati, “Jurnal Pendidikan MIPA,” *J. Pendidik. MIPA*, vol. 12, no. 1, pp. 682–689, 2022.
[25] L. O. Fradi, T. Laurens, and W. Mataheru, “Etnomatematika Dalam Transaksi Jual Beli Yang Dilakukan Pedagang Di Pasar Tradisional Kabupaten Kaimana,” *JUMADIKA J. Magister Pendidik. Mat.*, vol. 1, no. 1, pp. 1–8, 2019.
[26] S. Indriyani, *Eksplorasi Etnomatematika Pada Aksara Lampung*. Bandar Lampung : Unila, 2017.
[27] S. Siregar and R. Restati, “Persepsi Siswa Pada Pelajaran Matematika: Studi Pendahuluan Pada Siswa yang Menyenangi Game,” *Pros. Temu Ilm. X Ikat.*

Psikol. Perkemb. Indones., vol. 1, no. 1, pp. 224–232, 2017.
[28] L. Rahmawati, Z. Zaenuri, and I. Hidayah, "Pembelajaran Bernuansa Etnomatematika Sebagai Upaya Menumbuhkan Karakter Cinta Budaya Dan Kemampuan Pemecahan Masalah Matematis," *J. Authentic Res. Math. Educ.*, vol. 5, no. 1, pp. 25–32, 2023.
[29] M. Melisa, W. Widada, and Zamzaili, "Pembelajaran matematika realistik berbasis etnomatematika Bengkulu untuk meningkatkan kognisi matematis," *J. Pendidik. Mat. Raflesia*, vol. 4, no. 2, pp. 103–110, 2019.
[30] R. Andriono, "Analisis Peran Etnomatematika dalam Pembelajaran Matematika," *ANARGYA J. Ilm. Pendidik. Mat.*, vol. 4, no. 2, 2021.