

**ETHNOMATHEMATICS IN BUYING AND SELLING TRANSACTIONS CONDUCTED BY
MANDAILING COMMUNITY OF MEDAN CITY**

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ABSTRACT

This research proves that there is a connection between mathematics and culture and also knows that there are other ways to calculate arithmetic and its operations that are different from the way they are taught in school. This research is also expected to be useful to change people's opinion that math has no influence at all with culture. This research is a descriptive research with a qualitative approach. The data collection methods used were observation and interview. The research subjects were 5 sellers. The data analyzed in this study is the process of buying and selling transactions carried out by the Mandailing community of Medan City and how to calculate addition, subtraction, multiplication and division carried out by sellers and buyers. The results showed that the buying and selling process carried out by the community uses several methods, namely how they determine the selling price, how to calculate the addition, how the payment is made by the buyer, how the seller gives change to the buyer, how the seller gives the rest of the payment if the seller does not have change and how to round. The culture and language used around traditional markets is non-standard Indonesian or everyday language. However, when sellers and buyers who have the same ethnicity such as Mandailing will use Mandailing language in their interactions. Likewise, the interaction between sellers and other sellers.

Keywords: Ethnomathematics; Transactions; Mandailing; Traditional; Market.

INTRODUCTION

Mathematics as the queen of sciences means that mathematics is the source of all disciplines and the key to science. Mathematics (Suherman et al, 2001) also functions to serve science, meaning that in addition to growing and developing for itself as a science, mathematics also serves the needs of science in its development and operation. This definition means that mathematics is a basic science, both its applied aspects and its reasoning aspects have an important role in efforts to master science and technology.

According to Na'imatul (2015) mathematics has a good role in various cultures, precisely in the habits of a tribe or society as well as in terms of its customs. However, people often do not realize that in some of the activities carried out there are mathematical activities. In fact, sometimes they are still confused in using mathematical concepts learned in school to be applied in everyday life. The fact that exists in the community is very contrary to the real function of mathematics. The function of mathematics is to develop the ability to count, measure, derive formulas, and use mathematical formulas in everyday life through measurement and geometry, algebra, chance and statistics, calculus, and trigonometry.

According to Javier Díez-Palomar, Ksenija Simic, Maura Varley in Zulkifli (2016), math is everywhere. Mathematics is closely related to everyday life. Wherever and as anything always uses mathematical knowledge. Daily habits or activities are full of math. The term used to link mathematics, culture and anthropology is called Ethnomathematics. Ethnomathematics also refers to any knowledge, activity characteristic of a social or cultural group that can other groups.

In everyday life, without realizing it, people often use basic mathematical concepts which are examples of the application of ethnomathematics, one of which is counting activities. Counting can be done by anyone. Everyone will use math concepts in their lives. A trader can calculate the results of his sales, calculate his profits, calculate the amount of price bought by the buyer and others. In conducting buying and selling transaction activities, many things are done by sellers and buyers when making transactions.

The understanding of values in mathematics learning (Soedjadi, 2000) conveyed by teachers so far has not touched on all aspects of life. Mathematics is seen as a tool for solving practical problems in the world of science alone, thus ignoring the view of mathematics as a human activity.

Both views are not wrong at all; both are correct and in line with the growth of mathematics itself. As a result of the routine teaching of mathematics so far, the view that mathematics is merely a tool has become inappropriate in the education process of the nation's children. Many incidents have been encountered in the field where teachers emphasize teaching tools, telling or showing tools and how they are used, how children learn to use them, without knowing how the tools are made or without questioning why they are used. In fact, many teachers are tempted to meet high test score targets, causing many other values that are far more important to students to be forgotten. Such a mathematics education process makes it highly likely that children will only memorize without understanding and comprehending the meaning, whereas the principle should be that memorization is only allowed after understanding and comprehending the meaning.

Linguistically, ethnomathematics (Na'imatul, 2015) consists of three words, namely the prefix "ethno," which is interpreted as something very broad that refers to the socio-cultural context, including language, jargon, codes of conduct, myths, and symbols. The second root word "mathema" tends to mean explaining, knowing, understanding, and performing activities such as coding, measuring, classifying, concluding, and finally modeling. The suffix "tik" comes from techne and has the same meaning as technique.

Another opinion regarding the definition of ethnomathematics explained by Rosa and Orey (2011) is:

"In other words, ethno refers to members of a group within a cultural environment identified by their cultural traditions, codes, symbols, to explain and understand the world in order to transcend, manage and cope with reality so that the members of cultural groups can survive and thrive, and tics refer to techniques such as counting, ordering, sorting, measuring, weighing, ciphering, classifying, inferring and modeling".

According to this opinion, ethnomathematics can be defined as activities carried out by a community within a particular group or tribe involving counting, measuring, weighing, sorting, coding, grouping, concluding, and modeling.

One example of ethnomathematics activities carried out by the Mandailing community is in buying and selling. In this activity, one example of ethnomathematics can be seen when the seller gives change to the buyer.

Culture is a key concept used in the discipline of anthropology. According to Meirina Inanta (2006), culture encompasses learned behaviors, beliefs, and attitudes that are characteristic of a society or population.

The Batak tribe consists of six sub-tribes, namely the Toba Batak, Karo Batak, Simalungun Batak, Phak-Phak, Mandailing, and Angkola. They inhabit parts of North Sumatra, namely the Karo highlands, Langkat, Hulu, Simalungun, Dairi, and Toba Hulu. According to torombo (stories), the Batak ethnic group originated from a single ancestor, namely the Raja Batak.

The primary cultural values of the Batak (Mandailing) (Susilowati, 2012) that are most prominently expressed are kinship and religious values, indicating that the Mandailing tribe has a strong sense of tribal and religious identity.

Based on past traditions, the Mandailing ethnic region consists of two parts, namely Mandailing Godang (Greater Mandailing) in the north, and Mandailing Julu (Upper Mandailing) in the south, bordering the province of West Sumatra. It is in this region that the clans reside, among the largest of which are the Lubis and Nasution clans. Today, the Mandailing region is administratively part of Mandailing Natal Regency, North Sumatra Province.

In their daily activities, the Mandailing community in Medan, who live around the traditional Bersama market, mostly engage in buying and selling, especially in the morning when they flock to the market to buy vegetables and other items. Here, sellers and buyers conduct transactions, and there is a unique activity associated with these transactions.

The principle of buying and selling (Rahman, 3) is carried out in connection with the transfer of ownership of goods or objects. The bank's profit margin is determined in advance and becomes part of the price of the goods sold. Buying and selling transactions can be distinguished based on the form of payment and the time of delivery.

The selling price is the bank's purchase price from the supplier plus profit (margin). Meanwhile, salam is a sale and purchase transaction in which the goods being traded do not yet exist. The goods are delivered on credit while payment is made in cash. In this transaction, the quantity, quality, price, and time of delivery of the goods must be determined precisely.

When adding, subtracting, multiplying, and dividing, sellers and buyers have their own methods of calculation, leading to arithmetic models that differ from those taught in school. This research demonstrates the connection between mathematics and culture and reveals that there are alternative methods of arithmetic calculation and operations that differ from those taught in school. This research is also expected to be useful in changing the public's opinion that mathematics has no influence on culture.

In this study, the area selected by the researcher was the city of Medan, specifically on Jalan Bersama, Medan Tembung District, Bandar Selamat Village. The activity selected for this study was buying and selling transactions. This was because the traditional market traders were predominantly from the Mandailing ethnic group, and some of them had low levels of education, but they were able to use mathematics in their own way. Thus, the author chose the title "Ethnomathematics in Buying and Selling Transactions Conducted by Mandailing Community of Medan City" for this study.

RESEARCH METHOD

In this study, the type of research used is descriptive research with a qualitative approach. Qualitative research (Moleong, 2012) aims to understand the theories about what the research subjects experience, such as behavior, perceptions, motivations, actions, and others, in a holistic manner and through descriptive language within a natural context, utilizing various natural methods. Descriptive research (Arikunto, 2006) is research intended to collect information about the status of an existing phenomenon. This research was conducted on sellers and buyers at the Bersama traditional market. The research subjects were selected randomly. Two subjects were selected from each group of sellers and buyers who were indigenous Mandailing people living around Bersama. If the data from the two research subjects was insufficient, additional subjects were selected until the desired data was sufficient and met the research objectives.

The research steps taken are as follows.

1. Introduction: In this step, initial observations were made regarding the buying and selling processes carried out by the Mandailing community, especially in the calculation process. The

purpose of these initial observations was to facilitate the creation of interview guidelines so that the arithmetic model used by sellers and buyers in calculating arithmetic operations could be identified.

2. Creating instruments: In this study, the instrument created was an interview guideline.
3. Collecting data: Data collection was carried out through interviews and writing field notes from each research subject.
4. Data analysis: This was done by grouping the research data according to the focus of the study and the research objectives. Next, analyzing the data, discussing and describing the research findings. Additionally, triangulation of sources was conducted with two individuals other than the seller who was the research subject and the parents who have lived in Cukung Village for a long time and are native Mandailing people.
5. Conclusion, the conclusion at this stage was drawn by summarizing the research findings based on the research problem formulation.

In this study, the data collection methods used were observation and interviews. The type of interview used was semi-structured interviews. Interviews were conducted using only a general interview guide, with further details developed during the interview. The researcher is the most important instrument in the study. The researcher can determine who is appropriate to use as a data source and also collect data through interviews. Data analysis was conducted by reducing the data through summarization, selecting key points, and focusing on important aspects. Data presentation is done in the form of brief descriptions, charts, relationships between categories, and similar formats. However, data analysis in qualitative research often involves the use of narrative text.

RESULTS AND DISCUSSION

This study was conducted on Tuesday, July 3, 2025, at the Bersama Traditional Market on Jl. Bersama, Bandar Selamat Village, Medan Tembung District, Medan City. Vendors at the Bersama Traditional Market generally sell their goods from 5:00 a.m. to 1:30 p.m. The vendors at this traditional market are predominantly from the local Mandailing ethnic group. This can be observed from their language and speaking style.

From the large number of vendors selling at the traditional market, we selected five vendors as samples for our research: a chili vendor, a vegetable vendor, an egg vendor, an anchovy vendor, and a fresh fish vendor.

From the interviews conducted at the market, four vendors enjoyed mathematics or arithmetic during their education, while one vendor did not enjoy mathematics or arithmetic.

Based on the interviews conducted, there are various reasons why traders like mathematics. Trader 1, Mrs. Astuti, answered that she has liked mathematics since elementary school, but she only knows addition and subtraction. She thought that mathematics was not necessary, but I understand that mathematics is actually very important for everyday life.

The same question was asked to the second merchant, Mrs. Nani. She also answered that she likes math because she often plays games that require calculations. She forgot the name of the game. When we talked about number games, we spontaneously mentioned Sudoku. Yes, that's the game she meant, and we also talked about Sudoku, which requires the merchant to master quick calculation skills.

The next merchant, the third one, was Mr. Ucok, and he answered that he both liked and disliked it. He liked mathematics, especially when it came to counting money. But he disliked it when it involved calculating more complex things. He said that just seeing numbers was enough to tire him out.

The fourth merchant was Mrs. Yetti. She admitted that she liked mathematics and it was her favorite subject. However, life circumstances led her to become a merchant because she couldn't continue her education. No matter how great the working world is, the world of education is even greater.

The last merchant was Mrs. Diana. This merchant admitted that she didn't like math because it was difficult. She felt or had already thought that math was too busy, so she brought that mindset with her until now.

Next, based on the first question asked, we asked the next question, which was how mathematics relates to traders. After researching, it was proven that buying and selling transactions that occur in traditional markets are closely related to mathematics. Merchants frequently utilize social arithmetic in their transactions, such as addition, subtraction, multiplication, and division.

This can be observed in how they determine selling prices, calculate totals, process payments from buyers, provide change to buyers, handle remaining payments if they lack change, and perform rounding.

The way merchants determine selling prices is one application of mathematics. The selling prices set by sellers are rounded to the nearest five hundred or thousand to make calculations easier and to anticipate change if there are no coins available. To ensure that no items or prices are overlooked, the five merchants use the following method: as they place the items purchased by the buyer into a plastic bag one by one, the seller also calculates the price of each item placed into the plastic bag.

When determining the selling price, the seller must first check the purchase price at the wholesale market. For vegetable sales, residents of Medan use the term “seikat,” which refers to vegetables tied in small bundles. Fish and meat sales are typically sold by the plate, but some items like shrimp and squid are wrapped in plastic. For items like chili peppers or tomatoes, some are sold using a scale, while others are sold based on an estimate, adjusting to the buyer's desired price. During the bargaining process, the seller may accept the buyer's offer if the price is not lower than or equal to the purchase price at the wholesale market.

When calculating the total cost of purchased items, if the buyer purchases a large quantity, a calculator is typically used. However, if the quantity is small, the seller counts each item individually and may round the total or disregard small amounts like IDR 500 or vice versa.

The payment method used by the buyer is also related to how the seller gives change to the buyer. For example, if a buyer spends IDR 12,500 and gives IDR 22,500, the seller must return IDR 20,000. This often occurs because of rounding to ensure the change given is a round number. Therefore, most buyers do as demonstrated. Or the seller may request additional money and return a rounded amount.

If the seller does not have change, they may replace it with an item they sell and provide the equivalent value of the missing change. For example, a buyer purchases chili peppers, tomatoes, and so on. The total purchase amount is IDR 37,500. The buyer gives the seller IDR 40,000. The change should be IDR 2,500. The seller only has IDR 2,000. Since the seller does not have IDR 500 in change, the seller replaces it with chili peppers worth IDR 500.

The last method is rounding. This method is commonly used and closely related to the other methods. Generally, every seller uses rounding to simplify calculations when totaling the buyer's purchases, calculating profits, losses, and other calculations.

The culture and language used around traditional markets is non-standard Indonesian or everyday language. However, when sellers and buyers from the same ethnic group, such as Mandailing in interact, they use the Mandailing language. The same applies to interactions between sellers.

CONCLUSIONS

Based on the results of the analysis and discussion, conclusions can be drawn regarding ethnomathematics in the buying and selling process carried out by the Mandailing community in Medan at traditional markets as material for mathematics learning. The buying and selling transactions carried out by the community led to the conclusion that the selling prices used by sellers were rounded up to the nearest five hundred or thousand. To ensure that no items purchased are overlooked, the method used is to count each item one by one as they are placed into plastic bags. This also indicates that the sellers do not calculate the total price all at once but rather add up each item individually. To determine the selling price, one must first check the market price, as market prices can fluctuate daily. For the sale of kitchen essentials like chili peppers and tomatoes, some sellers use a scale to measure the quantity, while others estimate the amount based on the buyer's reference price for the item being purchased. When returning change, the seller first rounds the remaining amount to the nearest ten, then adds the necessary amount to reach the total paid. During the bargaining process, sellers can set the agreed price as long as the price offered by the buyer is not the same as or lower than the price the seller paid when purchasing at the wholesale market. The methods of calculation used by sellers and buyers during transactions in traditional markets involve arithmetic operations such as addition, subtraction, multiplication, and division. The culture and language used around traditional markets is non-standard Indonesian or everyday language. However, when sellers and buyers from the same ethnic group, such as Mandailing, interact, they use the Mandailing language. The same applies to interactions between sellers and other sellers.

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