International Journal of Evaluation and Research in Education (IJERE)
Vol. 14, No. 2, April 2025, pp. 887~897
ISSN: 2252-8822, DOI: 10.11591/ijere.v14i2.27779

A reflective analysis of the Losarang-Indonesian Dayak community's thinking culture in selecting a life partner

Mellawaty, Yohanes Leonardus Sukestiyarno, Isnarto, Zaenuri
Department of Mathematics Education, Faculty of Mathematics and Natural Sciences, Universitas Negeri Semarang, Semarang, Indonesia

Article Info

Article history:

Received Jun 13, 2023
Revised Aug 12, 2024
Accepted Sep 2, 2024

Keywords:

Ethnomathematics
Ethnomodelling
Local culture
Mathematics education
Realistic ethnographic design

ABSTRACT

This research uses a realistic ethnographic design to examine the culture of mathematical thinking in determining the match between partners for marriage in the Losarang-Indonesian Dayak community. Data were collected through field notes, in-depth interviews, and observation. Ethnomathematics as a research genre reveals important universal elements of mathematical activity, while ethnomodelling reflects ideas and the practice of community mathematics through ethical, emic, and dialectical approaches. The findings of this research indicate that ethnomathematically, the Losarang-Indonesian Dayak community have used formal language on mathematical principles to develop a knowledge system capable of sorting, pairing, calculating, and comparing the suitability of partners based on birth. Ethnomodelling is a relevant mathematical idea and concept related to arithmetic operations, sets, relations, functions, and number comparisons. Furthermore, the implication of this research is to produce didactic situations to teach the concepts of arithmetic operations, sets, relations as well as functions, and number comparisons. The didactic situation of the customary patterns of the Losarang-Dayak community can also be presented in mathematics teaching materials based on local culture. Therefore, the successful conduction of this research can enrich the repertoire of developing school mathematics learning that focuses on local culture.

Corresponding Author:

Mellawaty
Department of Mathematics Education, Faculty of Mathematics and Natural Sciences
Universitas Negeri Semarang
UNNES Sekaran Campus Gunungpati, Semarang 50229, Central Java, Indonesia
Email: mellawaty@students.unnes.ac.id

1. INTRODUCTION

Mathematics is an aspect of cultural activity that tends to grow and develop in accordance with civilization [1], [2]. Mathematics is ingrained in every facet of civilization, including that of the Losarang-Indonesian Dayak community. It stresses how each person develops their own method for practicing mathematics, known as ethno-mathematics activities, and it enables the integration of mathematical ideas into cultural practices. Because every action has a close mathematical connection, mathematical understanding serves as the foundation for all human endeavors [3]. According to Gilsdorf [4], cultural development is formed when people change their habits regarding the establishment of meaningful beliefs.

The universal understanding of mathematics serves as one of the pillars for the advancement of science and technology [5]. Mathematics is a science since it permeates all aspects of life and cannot be isolated from them [6]. In terms of behaviors or habits that have been followed for many years and go back to the dawn of time, mathematics is quite similar to culture. Numerous human behaviors are unwittingly a part

of mathematics, and mathematical occurrences occur constantly [7]. Meanwhile, mathematics is defined as ideas, ways, and human techniques used to respond to cultural development [8]. According to previous studies [9], [10], culture produces mathematics, hence it can shape people's way of life.

The growth of mathematical activities and their application in different cultures is called ethnomathematics [11]. It is a conductor of the evolution of mathematical concepts within the framework of cultural anthropology, which categorizes mathematics as a social evolution-oriented conceptuality [10]. This entails calculating, sorting, measuring, weighing, coding, clarifying, drawing conclusions, and modeling [12].

In connection to the teaching of mathematics in schools, it would be useful to learn more about the interaction between culture and mathematics. Local wisdom or culture is a source of knowledge [13] in the form of cultural heritage, social norms, values, and customs [14] claim that they talked about the connection between culture and mathematics. It is also important because it is related to real life and can be linked to the learning process [15]. Additionally, many studies that integrate local wisdom in the learning process, such as, integrate the values of local wisdom into the Indonesian curriculum, integrate the values of local wisdom in the learning model and into problem-based learning.

The ethnomathematics approach is used to teach mathematics and certain mathematical concepts in schools [16]. The interpretation of various ethnomathematics contexts into an ideal mathematical model is called ethnomodelling [17], [18]. In simple terms, it is one of the practical application approaches of ethnomatematics [16]. Moreover, it is used to describe culture based on a modeling process (emic) with academic mathematical representations (etic) and through a dialogic procedure [17]. Ethnomodelling is expected to create a multicultural-based mathematics education [10]. Hence, students can appreciate the diverse cultural values of different societies [19].

In this context, several preliminary studies have been carried out on ethnomathematics exploration and the ethnomodelling of Indonesian culture. Study by Umbara *et al.* [10] using the ethnomathematics exploration procedure to determine good agricultural days in the Cigugur traditional community in Kuningan Regency. This is in addition to the studies on the prey system and stillbirth efforts in Yogyakarta [8], the values of mathematics in Sundanese culture [19] and the description of the mathematical concepts found in traditional houses or "*tanean lanjang*" settlements in Madura [20]. Furthermore, Umbara *et al.* [10] explored ethnomatematics with an ethnomodelling methodological approach to the Cigugur community using calculations to determine the day to build a house. Prahmana and D'Ambrosio [21] researched geometric concepts and patterns of geometric shapes related to batik patterns in Yogyakarta, Indonesia. Meanwhile, Haryanto *et al.* [22] performed an ethnomathematics excavation to determine hidden mathematical values in the Millipede House knot in Arfak Papua Barat-Indonesia. Additionally, Muhtadi *et al.* [3] researched ethnomathematics exploration and used it to assess and measure the Sundanese culture.

The way we think mathematically in daily life is influenced by culture. According to Gravemeijer and Terwel [23], mathematics education describes the process through which human action generates mathematics. Ethnomathematics also studies mathematical ideas and practices of sociocultural groups. However, a lot of ethnomathematical research and investigations identify ethnomathematical forms of mathematics but do not develop pedagogical actions for this program. Classroom research about ethnomathematics and its role is a crucial part of this perspective because this program should be a mathematical education program [24]. From the standpoint of applying mathematical modeling to pedagogical action for the ethnomathematics program, teaching is an activity that introduces the creation of knowledge, therefore it encompasses much more than the transfer of knowledge [25]–[29]. This method of teaching mathematics is the opposite of transforming pupils into information-carrying vessels.

Based on the results of previous studies with respect to the Indonesian context, no research has explored ethnomathematics in the Losarang-Indonesian Dayak community regarding the activities involved in choosing a life partner. Therefore, this present research focuses on selecting an ideal life partner for the community in choosing an ideal life partner to establish a harmonious relationship that lasts for a long time. Ethnomathematical exploration in this context is reflected in certain activities such as sorting, pairing, calculating, as well as comparing the compatibility of partners based on birth date, the five days of the Javanese week, year, and month, which are used to predict lasting and enduring marriages. An exploratory process was extensively carried out to produce an ethnomodelling concept related to this custom usually practiced by the Losarang Dayak people. This was realized based on three alternative procedures, namely the emic, ethical, and dialogical approaches. Emic is used to understand mathematical ideas, procedures, and practices developed by cultural group members [10]. Ethics is employed to compare ethnological components across cultures to facilitate communication. The dialogic approach, is used in the process of dialogue and interaction between emic knowledge traditions and cultural ethics [17]. These led to the following research questions: i) what procedures are used by indigenous peoples to determine the best life partner?; ii) what mathematical concepts are used by the Losarang-Indonesian community in choosing the best life partner?; and iii) what mathematical concepts can be adopted in learning mathematics at school?

More than only the word ethno (ethnicity) or tribe is involved in ethnomathematics. From a research standpoint, ethnomathematics is referred to as an anthropology of mathematical culture and instruction. Important and fundamental beliefs that have been passed down from one generation to the next can be found in cultural practices, such as habits. Applying mathematical principles yields a variety of outcomes and is a habit that never ends. Ethnomathematics is the study of mathematics in cultural contexts. Ethnomathematics can have an impact on how culture is taught and learned, therefore it can be incorporated into the curriculum. Given the variety of cultural practices seen around the world, ethnomathematics is one method of humanizing mathematics [25], [30], [31]. Ethnomathematics tends to connect mathematics with its settings and stresses the communal. When these two elements are combined, ethnomathematics can be seen as a philosophical, contextual, emotive, and attitudinal approach to the curriculum. This is because mathematics can be humanized with ethnomathematics.

2. METHOD

2.1. Research approach

A realist ethnographic approach was used in this research to explore the ethnomathematics and ethnomodelling of the community culture of the Dayak Losarang-Indonesian. Furthermore, ethnomathematics exploration is based on four aspects, namely general questions, initial answers, critical constructs, and specific activities. It also depends on the six dimensions of universal mathematical exercises, such as calculating, discovering, measuring, designing, playing, and explaining. This study uses six dimensions of basic universal mathematics tasks: find, design, describe, weigh, measure, and play to investigate ethnomathematics [32]. Rosa and Orey [17] stated that ethnomodelling exploration is based on emic, ethical, and dialogical approaches. In this research, the emic approach was used to gather information from participants regarding mathematical activities in their culture, which represents mathematical processes in society. Meanwhile, the dialogic approach is used to communicate problems related to the incompatibility between emic and ethical procedures.

The phenomenographic approach was chosen to explain the world in everyday life from a cultural perspective. Learning techniques, teaching approaches, interpreting scientific concepts taught in class, and other issues can all be studied using phenomenographic data collection and analytical methods or understanding social issues unrelated to the education system [33]. Figure 1 shows the operating diagram of research object in phenomenographic approach.

2.2. Research participants

The observer and the research subjects comprised key, primary, and additional informants. These are mainly active leaders and members of the Losarang-Indonesian Dayak community who understand these Indigenous people's culture, customs, and habits, as shown in Figure 2. Furthermore, informants have sufficient time to provide relevant information, which can be communicated using Indonesian. Based on these criteria, five informants were selected, namely the customary leader of the Dayak Losarang community as the key informant and four active followers, as shown in Figure 3.

Practically, information was sequentially extracted from important, primary, and additional informants. Interview sessions were conducted systematically to guarantee the validity of the research data because the clarification process was quickly performed. The three types of informants were subjected to different protocols according to their respective characteristics. Interview sessions conducted with key informants were initially carried out through informal conversation. At this stage, the informants were asked about their background and made to answer behavioral and demographic questions. The answers were used to explore the diverse technologies and equipment used by most people, the habits often exhibited, the carrying capacity of their environment, and beliefs about certain activities. A guideline approach, namely standard open interviews, was adopted in the next stage. The two sessions were performed by asking knowledgeable and constructive questions about buildings and when the people intend to construct their personal houses.

Meanwhile, interview sessions were alternatively held with primary and additional informants, using guided and standard open approaches. Both types are based on experience, behavioral, and constructive knowledge, while contrasting questions exist. These were asked to distinguish between certain qualities, thereby leading to the cross-checking of information to guarantee the validity and reliability of the research data. The primary and additional informants were asked questions that focused on how to construct buildings, relevant habits, and procedures usually considered by the community during the execution of the project. The five informants were interviewed three times in different settings, and each concession duration lasted less than two hours. Data was collected from August to November 2021 using an audio recording device.

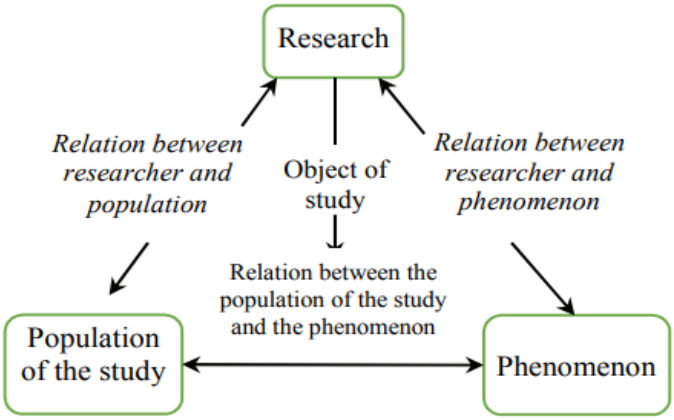

Figure 1. Research object in phenomenographic approach

Figure 2. Research participants

Figure 3. Researchers and traditional leaders

2.3. Data collection technique

The data collection technique adopted an ethnographic design by conducting participant observation and in-depth interviews. Furthermore, participant observation was achieved by directly participating in the observed situations or settings, while in-depth interviews are the main techniques qualitatively employed to discover the respondents' ideas, opinions, and experiences. The participants comprise members of the Losarang-Indonesian Dayak community who plan to build a house. Interview sessions were carried out in stages based on the selected informants. Data collection was realized through observation and interviews, which led to the production of field notes, audio and video recordings, as well as photographs. The interview aims to explore the respondents' ideas, opinions, and experiences based on their thoughts and feelings. More specifically, it was held to compare or cross-check the observations' results.

2.4. Data analysis

The data analysis consisted of content analysis, triangulation, and pattern-finding techniques. Content analysis techniques present detailed, valid data about the culture and habits of the subjects at the research location. This procedure indirectly studies human behavior through communication analysis [34]. The triangulation technique is used to determine the validity of an ethnographer's observations, which consists of checking the information heard or seen by someone by comparing its sources. Simultaneously, pattern setting checks ethnographic reliability towards disclosing data consistency [35]. The triangulation and content analysis techniques employed are data source and symbol coding procedures used to interpret the acquired information. The discovery of patterns is related to creating categories used during the analysis. Data analysis is carried out through reduction, display, verification, and conclusion. Based on these three techniques, the validity, as well as the reliability of the acquired information, can be guaranteed.

3. RESULTS AND DISCUSSION

The definition of culture as a connecting medium between mathematics and the culture of society is used to explain mathematical concepts and ideas. By utilizing ethnomathematics, one can make learning mathematics relevant and meaningful by describing everyday experiences, making it easier for students to remember and master mathematical concepts. Children learn mathematics and culture along with ethnomathematics.

It is interesting to note from the research process that students can use ethnomathematics in the context of calculating a spouse as a reflective review of learning mathematics. This does not rule out the possibility that the calculation of determining a life partner can teach them the meaning of mathematics. It is necessary to carry out additional research in the form of research to examine the calculation of determining a spouse which is often carried out by the Dayak-Losarang community to find out the extent to which ethnomathematics is meaningful for the learning process.

3.1. Results

3.1.1. Ethnomathematics exploration of indigenous peoples of the Dayak Losarang-Indonesian in determining a life partner

The acquired results describe the habitual patterns of the Losarang-Indonesian Dayak community related to being calculative in terms of determining an ideal life partner based on birth date, the five days of the Javanese week, year, and month. To understand the human character or one's personality, the Losarang-Indonesian Dayak community base it on the time of birth. It is usually calculated to determine how to match make individuals based on the total concept of the values attached to the day, month, year, and Javanese week (*pasaran*). The basis for this calculation refers to the Javanese calendar which has two-day cycles, namely the weekly which consists of seven days, namely Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, and Saturday, as well as the week (*pancawara*) which comprises of the five *pasaran* days, including *Legi*, *Pahing*, *Pon*, *Wage*, and *Kliwon*. Furthermore, the cycle of values attached to the day, month, year, and *pasaran* is referred to as "*naktu* or *neptu*" [36], as shown in Table 1.

Based on Table 1, the Losarang Dayak community decipher the value of each day based on the Javanese *primbon* book (Javanese ancestral book). However, in this book, Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, and Saturday has five, four, three, seven, eight, six, and nine values, respectively. Moreover, these days and match making calculations are also based on *pasaran* names. The term "*pasaran*" refers to a weekly cycle of five days, which are *Legi*, *Pahing*, *Pon*, and *Wage*. Similar to normal seven days, based on Table 2, *pasaran* are also used as the basis for determining a life partner. *Legi*, *Pahing*, *Pon*, *Wage*, and *Kliwon* has values of five, nine, seven, four and eight, respectively. Furthermore, the weekly cycle between the day and *pasaran* is shown in Figure 4.

Table 1. Day name and *naktu* (value)

Day (the name of day)	*Naktu*/value
Ahad (as of Sunday)	5
Senen (as of Monday)	4
Slasa (as of Tuesday)	3
Rebo (as of Wednesday)	7
Kemis (as of Thursday)	8
Jumah (as of Friday)	6
Saptu (as of Saturday)	9

Table 2. The name of Pasaran and *naktu* (value)

The name of *pasaran*	*Naktu*/value
Legi	5
Pahing	9
Pon	7
Wage	4
Kliwon	8

The weekly and *pasaran* cycles consists of seven, namely Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, and Saturday, and five days including *Legi*, *Pahing*, *Pon*, *Wage*, and *Kliwon*. Interestingly, these tend to form an ordered pair, for example Sunday is paired with *Legi* (Sunday *Legi*), Monday with *Pahing* (Monday *Pahing*), Tuesday with *Pon* (Tuesday *Pon*), Wednesday with *Wage* (Wednesday *Wage*), Thursday with *Kliwon* (Thursday *Kliwon*). Friday is paired with *Legi* (Friday *Legi*), while Saturday is paired with *Pon* (Saturday *Pon*). A cycle pairing these days and *pasaran* tend to result in 35 pairs. This is called

"*weton*" which simply implies birth. It can also be interpreted as a combination of the days and *pasaran* associated with the birth of a baby, for example Tuesday *Pahing*, Thursday *Kliwon*, and Sunday *Wage*. *Weton* is often associated with predictions about one's personality, character, and luck on that day.

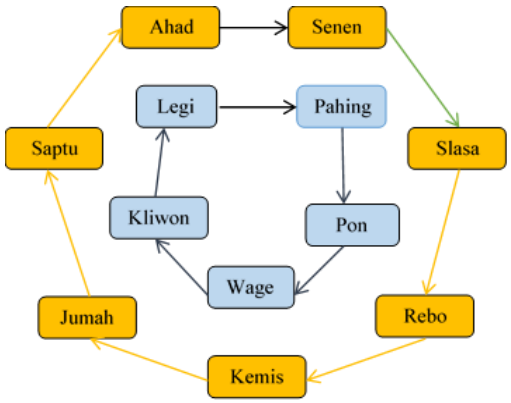

Figure 4. Day and *pasaran* cycles

As presented in Table 3, if a person is born on Sunday with *Wage*, then the value (*naktu*) of the day and *pasaran* is 5+4=9. However, 9 is obtained because Sunday and *Wage* have values of 5 and 4, respectively. Therefore, the next parameter in determining matchmaking activity is to calculate the pair *weton*, then ensure it aligns with the symbol on the realized results. These have been written in the *primbon* book of the Dayak Losarang-Indonesian indigenous people, as shown in Table 4.

Table 3. *Weton* reckoning day

Day in general \ Day in Java	*Wage* (4)	*Kliwon* (8)	*Legi* (5)	*Pahing* (9)	*Pon* (7)
Sunday (5)	9	13	10	14	12
Monday (4)	8	12	9	13	11
Tuesday (3)	7	11	8	12	10
Wednesday (7)	11	15	12	16	14
Thursday (8)	12	16	13	17	15
Friday (6)	10	14	11	15	13
Saturday (9)	13	17	14	18	16

Table 4. *Weton* calculation result symbol

Result	Symbol	Result	Symbol	Result	Symbol
1	*Pegat*	13	*Tinari*	25	*Pegat*
2	*Ratu*	14	*Padu*	26	*Ratu*
3	*Jodoh*	15	*Sujanan*	27	*Jodoh*
4	*Topo*	16	*Pesthi*	28	*Topo*
5	*Tinari*	17	*Pegat*	29	*Tinari*
6	*Padu*	18	*Ratu*	30	*Padu*
7	*Sujanan*	19	*Jodoh*	31	*Sujanan*
8	*Pesthi*	20	*Topo*	32	*Pesthi*
9	*Pegat*	21	*Tinari*	33	*Pegat*
10	*Ratu*	22	*Padu*	34	*Ratu*
11	*Jodoh*	23	*Sujanan*	35	*Jodoh*
12	*Topo*	24	*Pesthi*	36	*Topo*

Based on Table 4, the "*Pegat*" symbol is interpreted as "if this is obtained, the couple is bound to face certain problems, be it in terms of the economy, power, infidelity, which will eventually result in divorce." The calculation results of the *pegat* symbol are in the order of 1st, 9th, 17th, 25th, and 33rd. The "*Ratu*" symbol means, "if this is obtained, the relationship will last forever, as well as be respected by neighbors and other people. Many are envious of the harmony in your household." The results of the *Ratu* symbol fall in the order of 2nd, 10th, 18th, 26th, and 34th. The matching symbol means "if this is obtained,

they will match each other. Both tend to accept each others imperfections, and married life will run smoothly until old age." The acquired results fall in 3rd, 11th, 19th, 27th, and 35th. Furthermore, the "*Topo*" symbol means, "if this is obtained, at first it is bound to be difficult, but in the end, it will be easy. From the onset, the individual involved will often encounter problems, be it in the economy or other related issues. However, your life will be comfortable when you have children and have been married for a long time." The results of the calculation of the *topo* symbol fall in the 4th, 12th, 20th, 28th, and 36th.

The "*Tinari*" symbol is interpreted as "if this is obtained, the couple will find pleasure, successfully seek fortune as well as not lack anything, in one's married life", and this falls in the 5th, 13th, 21st, and 29th. The "*Padu*" symbol implies, "if this is obtained the couple will always fight, and irrespective of these issues, you will not get divorced." In early married life, the couple are bound to fight due to a series of issues daily," and this falls in the 6th, 14th, 22nd, and 30th. The symbol of "*Sujanan*" is reported as, "if this is obtained, the couple will often fight and have lots of problems about infidelity." Whether it is from the man's or woman's side, or it could also be that both of them are having an affair," and this falls in the 7th, 15th, 23rd, and 31st. The symbol of the "*Pesthi*" is interpreted as "if this is obtained, household life would be peaceful and harmonious till old. Even though there are bound to be several problems, it will not destroy the harmony of the household," and this falls in the 8th, 16th, 24th, and 32nd.

3.1.2. Ethnomodelling of Losarang-Indonesian indigenous Dayak people in determining a life partner

The results acquired in the present research show that the community exhibits unique habits in terms of determining the auspicious day used to start a mate. The Losarang-Indonesian indigenous Dayak community uses (1):

$$HWJ = NWP + NWL$$

Where,

$$NWP = NHP + NPP$$
$$NWL = NHL + NPL$$

Explanation:
HWJ : Count *weton* matchmaking
NWP : *Naktu weton* female
NWL : *Naktu weton* male
NHP : *Naktu* female's day
NPP : *Naktu* women's *pasaran*
NHL : *Naktu* male's day
NPL : *Naktu* male's *pasaran*

For example:
Mellawaty and Aditia Tristiana were born on Thursday, October 18, 1990, and December 18, 1987, respectively. The research question is, are they a good match?
Answer illustration:
Mellawaty (NWP) was born on October 18, 1990. Based on the cycle between the day and *pasaran*, a combination of the Thursday *Wage* pair was obtained. It means:
Mellawaty (NWP) = Thursday + Wage (Add up the day and *pasaran* combinations)
= NHP + NPP (Combined day and *pasaran* sum formula)
= 8 + 4 (Add up the *naktu* of the day and *pasaran*)
= 12
Aditia Tristiana (NWL) was born on December 18, 1987. Monday *Wage* is obtained based on the cycle between the day and *pasaran*. It means;
Aditia Tristiana (NWL) = Monday + Wage (Add up the combination of days and *pasaran*)
= NHL + NPL (Combined day and *pasaran* sum formula)
= 4 + 4 (Add up the *naktu* of the day and *pasaran*)
= 8
Furthermore,
HWJ = NWP + NWL
= 12 + 8
= 20

Based on Table 4, the calculated *weton* value of 20 produces the *Topo* symbol. It depicts, "If you do this, it will be hard at first, but easier in the end. From the start, you will often have problems, be it in terms of the economy or other issues. However, you will surely be comfortable when you have children and have been married for a long time."

Based on the explanation, two parameters are used, including the day of birth (*weton* date), and the value of the five daily rounds (*naktu* pasaran). *Naktu* is the value attached to the day, five daily cycles, month, and year. The community agreed upon this concept, and it is continuously used from generation to generation. Generally, the value known as *naktu* has the same composition and is used by the Javanese. *Naktu weton*, or birthday is one unit, in other words, each day has the specificity of the five daily cycles that make up one cycle. This cycle is repeated every day, for example, Sunday *Legi*, Monday *Pahing*, Tuesday *Pon*, *Wage* Wednesday, *Kliwon* Thursday, *Legi* Friday, *Pahing* Saturday, and others. Moreover, a cycle is defined as the relationship between two successive sets.

For example:
A is the set of days
A = {Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, Saturday}
$A = \{a_1, a_2, a_3, a_4, a_5, a_6\}$
B is the set of *pasaran*
B = {Legi, Pahing, Pon, Wage, Kliwon}.
$B = \{b_1, b_2, b_3, b_4, b_5\}$
Formally, A and B are defined.
The Cartesian product of A and B is a set = A X B = {(a,b) | a ∈ A, b ∈ B}.
A X B $= \{a_1, a_2, a_3, a_4, a_5, a_6, a_7\}$ X $\{b_1, b_2, b_3, b_4, b_5\}$
$= \{(a_1, b_1), (a_2, b_2), (a_3, b_3), (a_4, b_4), (a_5, b_5), (a_6, b_6), (a_7, b_1), (a_1, b_2), (a_2, b_3), (a_3, b_4), (a_4, b_5), (a_5, b_1), (a_6, b_2), (a_7, b_3), (a_1, b_4), \ldots\}$

3.2. Discussion

Based on these findings, it was explained that the Losarang-Indonesian Dayak community uses addition and comparison as a mathematical idea to select a suitable partner. Additionally, the daily value is added to that of each *pasaran* using the sum principle. Comparing the complete results with the standard for choosing the best day for a mate is performed temporarily using the comparison concept. In accordance with the earlier description, daily life in the Losarang-Indonesian Dayak community is inseparable from mathematics, especially during the calculation process. According to Umbara *et al.* [10], the calculation concept resulting from the culture of the community is usually related to one's belief in traditional groups, not binding other cultural associations. Determining good days is a form of prediction by the members [10]. The truth of the prediction depends on one's belief in the hope that it will not harm the activity or work to be executed [36]. Due to respect to the correctness of the calculated results, it is hoped that the intended work to be carried out does not need to be too far off the mark or have a negative impact [10]. Although conceptually, the calculated values result in choosing the ideal partner, this only binds the group and not in practice. Individuals tend to either believe or not, depending on how confident they are of the concept.

The calculation concept, a human cultural activity, becomes some sort of knowledge occasionally developed from one generation to another [37]. Humans are unable to separate the concept of mathematics from their daily activities. Therefore, mathematical concepts serve as the basis for anything that can contribute to human civilization [38]. When it naturally emerges in these individuals' habits and daily activities, it tends to be represented by ethnomathematics. This is used to describe that mathematical concepts can be formed, represented, as well as implemented specifically in various cultural systems [39].

In another context, ethnomathematics and ethnomodelling can also be used to study mathematics that connects related concepts to human culture [19]. According to Prahmana *et al.* [21], these can be taught in Indonesia through ethnomathematics exploration. It has been proven to help students discern the relationship between mathematics and its reality as well as culture [21]. In learning this subject, ethnomathematics can be used as a didactic situation and a solution for developing contextual teaching materials.

Mathematical concepts and ideas are explained using cultural definitions as a channel for integrating mathematics and societal culture. By relating mathematical principles to real world situations, one can help students retain and master mathematical ideas by incorporating ethnomathematics into the classroom. In addition to learning ethnomathematics, children also learn mathematics and culture. It is very interesting to know that students can use ethnomathematics as a learning resource in that environment. This does not rule out the possibility that students can learn the meaning of mathematics through calculations to determine a life partner in the Losarang-Indonesian Dayak community, to find out how much ethnomathematics is useful in the learning process.

4. CONCLUSION

In conclusion, there are elements of mathematical calculations performed in the daily life of the Losarang-Indonesian Dayak community. This is manifested in several mathematical concepts, some of which are addition, comparisons, relations, and functions in calculating the suitability of a married couple. Therefore, it can be said that ethnomathematics is a complex and dynamic representation of how mathematics is used in a particular cultural community, influenced by socio-cultural aspects. Mathematics is the art of conceptualizing and conveying ideas about cultural products, which develops as it spreads throughout the community.

The use of ethnomathematics in learning mathematics can provide a culture-based learning atmosphere. The process of integrating ethnomathematics in learning can be carried out simultaneously, so that it can be a fun and innovative learning alternative. In addition, the use of ethnomathematics can reveal mathematical concepts used by indigenous peoples for generations. Mathematical concepts from people's habits exist, which can be seen from counting activities that can be used in school mathematics or academic mathematics. Therefore, the mathematical thinking process carried out by the Losarang-Indramayu Dayak indigenous peoples can be used in learning mathematics, so that it can help students understand mathematical concepts and form a love character for the surrounding culture.

The research only examines the mathematical thinking process of the Losarang-Indonesian Dayak community on the aspect of determining a life partner, while other aspects such as determining a good day to earn a living, construction of building forms, building houses and so on have not been studied by researchers. This study also only limited the study of ethnomodelling to the concepts of sets and arithmetic such as counting and comparing, while in other concepts the researcher was not found.

ACKNOWLEDGEMENTS

The authors would like to thank the Dayak-Losarang Indramayu community for their permission and cooperation in giving us the opportunity to study their ethnomathematics. The authors are also grateful to the Universitas Negeri Semarang for providing support for our research (B/14346/UN37.2/EP/2023).

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BIOGRAPHIES OF AUTHORS

Mellawaty is lecturer at the Wiralodra University, Mathematics Education Study Program. Bachelor of Mathematics Education at Pasundan University, Bandung, graduated in 2012; Masters in mathematics education at Pasundan University, Bandung, graduated in 2015; and currently carrying out doctoral studies in mathematics education at Universitas Negeri Semarang, Indonesia. Actively conducting research in the field of mathematics education and publishing research results in several national journals as well as national and international proceedings. Her research focuses on mathematics education, ethnomathematics, process and learning evaluation, mathematical modeling, mathematics learning media and technology, project-based learning and contextual problems. She can be contacted at email: mellawaty@students.unnes.ac.id; or mellawaty@unwir.ac.id.

Yohanes Leonardus Sukestiyarno is a Professor and Teaching Teacher at Semarang State University, Indonesia. He is passionate about improving the quality of teaching and learning of students and their development in schools and in higher education settings. Prof. Dr. Sukestiyarno research interest lies in teacher and teacher education, mathematics education, learning technology and media, ethnomathematics, literacy and numeracy, higher education, 21st century teaching and learning, school-based assessment, classroom research, and youth practice and their education. He can be contacted at email: sukestiyarno@mail.unnes.ac.id.

Isnarto is a doctor and lecturer at Semarang State University, Indonesia. He is passionate about improving the quality of teaching and learning of students and their development in schools and in higher education settings. Dr Isnarto's research interests lie in teacher and teacher education, mathematics education, technology and learning media, ethnomathematics, literacy and numeracy, higher education, 21st century teaching and learning, school-based assessment, classroom research, and youth practice and their education. He can be contacted at email: isnarto.math@mail.unnes.ac.id.

Zaenuri is a Professor and Teaching Teacher at Semarang State University, Indonesia. He is passionate about improving the quality of teaching and learning of students and their development in schools and in higher education settings. Prof. Dr. Zaenuri research interest lies in teacher and teacher education, mathematics education, learning technology and media, ethnomathematics, literacy and numeracy, higher education, 21st century teaching and learning, school-based assessment, classroom research, and youth practice and their education. He can be contacted at email: zaenuri@mail.unnes.ac.id.