

The Ethnomathematics of Calculating An Auspicious Day Process In The Javanese Society as Mathematics Learning

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Abstract

The purpose of this research is to describe the process of calculating an auspicious day in javanese society. This research is focused on the process of calculation an auspicious day for javanese wedding, specifically in Purworejo. This research is included to assessment research of ethnomatematics, because the research reveals daily activity conducted by ethnic at certain cultures. This research is kind of descriptive research with qualitative approach. Data collection methods applied in this research is interview. The subject of this study consisted of one informant who has been knowing the process of calculating an auspicious day in javanese society. In this research, data analysis is performed using descriptive analysis. The analyzed data in this study is the result of the interview. The result of this research shows that the process of calculating an auspicious day for javanese wedding, specifically in purworejo has been doing match activities and can be used as learning mathematics.

Keywords: *an auspicious day, ethnomathematic, mathematic education.*

Introduction

Tandiling (2013) said that ethnomathematics is a mathematics applied by a certain culture society, labor/farmer society, kids of certain social class, professional classes, etcetera. In research point of view, ethnomathematics is well known as cultural antropology (*cultural antropology of mathematics*) of mathematics and mathematics education. Mathematics is as basic study needed to analyze either basic of calculating science or computation applied in society to enrich the mathematics development.

In daily life, most of the people do not realize that they have been applying mathematics. They think that mathematics is just a subject that is studied in school. Whereas mathematics is often used in every aspects of life, such as measuring, calculating, numbering, and in some of transaction activities. According to D'Ambrosio (Puspawati and Putra, 2014), mathematics studied in school is known as academic mathematics, meanwhile ethnomathematics is mathematics applied by some cultural group which has been identified, such as ethnic society, group of labor, kids from certain age group, professional class and so on. Therefore it can be stated that ethnomathematics is mathematics appeared as the result

of the impact of the activity in the environment influenced by culture. Having known about ethnomathematics, the people can understand that mathematics is a study which is not only able to be studied in a classroom.

Etnomathematics is mathematics both grown and developed in a certain culture. Etnomathematics is perceived as a lense to see and understand that mathematics is a product of culture. The culture in this research refers to language of the society, place, tradition, how to both organize and interprate, conceptualization, and naming the physical and social world (Ascher, 1991). The research of ethnomathematics in mathematics has been included into all sectors, such as arsitecture, weaving, sewing, sibilings, ornaments, spiritual and religious practice which is often aligned with the pattern occured in nature. According to Puspawati and Putra (2014) the research about ethnomathematics has ever been analyzed, some of them are puzzle game of Hausa culture *Wasakwakwalwa* in North Nigeria, carpenter method of South Africa in deciding center box lid shaped rectangle, and so forth.

Method

The research is included into etnomathematic research, because it reveals the daily activity of one of ethnic group in a certain culture, and kind of descriptive research with qualitative approach (Sugiyono, 2012). The collecting data method applied is interview. The subject of the research is coming out from one interviewees knowing about the process of calculating an auspicious day in javanese society. The data analysis which is applied in the research is descriptive analysis.

Here are the steps of the research:

1. Introduction, at this step, the writer both decides the area and chooses ethnomathematics activity of javanese society. In this research, the javanese society is specified into the javanese society of Purworejo Regency.
2. Making a guidance of interview, the guidance made is only consisted of the outlines of the questions that the writer wants to know about.
3. Implementation, this step is consisted of collecting data taken from interview, about calculating an auspicious day for javanese wedding.
4. Data analysis, analyzing the result of interview, about calculating an auspicious day for javanese wedding.
5. Conclusion, at this step, the writer concludes the data analysis which has been analyzed in the previous step.

Result and Discussion

The Pattern of Calculating Auspicious Day for Javanese Wedding

Weton is a memorial day of birth commemorated in every 35 days. In javanese culture, weton does impact the daily life. One of the weton function is to calculate in searching an auxpicious day for wedding, building house, moving out from the house, or looking for the right time for circumcision. The total of weton can be known from birth day and pasaran usually written by parents.

In the modern life, calculating an auspicious day has been starting to be left behind, but there are still several groups of people believing and using that pattern. In the Javanese society, there is just some of the people in the village that can decide the auspicious day to throw an occassion.

In the calculating system of javanese, there is a basic concept called *cocog*, which means match, such as the matching of either padlock and key, or the man and the woman he will marry. There are several things which has to be paid attention and used in deciding auspicious day, like *netu* the day, and *pasaran* of the birthday date in javanese month of the future bride and the groom.

Deciding an auspicious day, most of the people calculate it based on 7 days (Monday – Sunday), and 5 *pasaran*. Each day has its own pattern which reflects the value of the day and *pasaran*. Here is the value list of the day and the *pasaran*.

Table 1.
Value of each day and *pasaran* of Javanese

No	Day	Value	No	Pasara n	Value
1	Mon	4	1	Legi	5
2	Tue	3	2	Pahing	9
3	Wed	7	3	Pon	7
4	Thu	8	4	Wage	4
5	Fri	6	5	Kliwon	8
6	Sat	9			
7	Sun	5			

It is only the birth day and the *pasaran* of the bride which is used as reference in deciding an auspicious day for the wedding. For the example, the birth day of the bride is Wednesday of Wage. There are two ways for determining the auspicious wedding day, the first one is using her birth day, the second one is using her *pasaran*.

1. Using the birth day

Steps:

- a. Making a day sequence from Wednesday until Tuesday.

Table 2. Sequence Day

Day	Wed	Thu	Fri	Sat	Sun	Mon	Tue
Sequence	1	2	3	4	5	6	7

Take her birth day or day that has even sequence (wednesday, thursday, saturday, and monday) for the example the writer takes thursday which its sequence number is 2.

- b. Matching the selected birth day with *pasaran*.

The rule of deciding *pasaran*, is looking for a mate who is if the *netu* of *pasaran* add up the *netu* of day, then it is divided by four, the residue is 1 or 2. Because the residue of 1 is a symbol of teacher (the person who becomes a role mode) and the one of 2 is a symbol of Wisnu (puppetry character who descends the gods). Meanwhile the symbol of 3 is a symbol of bromo (hot fire) and the 4 is symbol of senility (forgfulness or the person who has no calculating aspect).

Example: Thursday has *netu* number 8, it can be matched with *netu* number 5 (legi), or *netu* number 9 (pahing). So, the auspicious day for wedding is Thursday of Legi or Thursday of Pahing.

1. Using *Pasaran*

Steps:

- a. Making *pasaran* sequence from Wage until Wage, in order to decide the *pasaran*.

Table 3. *Pasaran* Sequence

<i>Pasaran</i>	Wage	Kliwon	Legi	Pahing	Pon
Sequence	1	2	3	4	5

Take her birth *pasaran* or *pasaran* which has even sequence (wage, kliwon, and pahing) for the example, the writers take kliwon *pasaran* because the sequence is 2.

b. Finding match day.

The rule of deciding auspicious day is looking for the day having *neptu* of that day which is if it is added up by *neptu* of *pasaran*, then it is divided by four, the residue is 1 and 2. Example: Kliwon has *neptu* number 8, so that, it can be matched with 3 (Tuesday), 6 (Friday), 9 (Saturday), and 5 (Sunday). Then, if the bride and groom want to throw wedding party in *pasaran* of Kliwon, so the match day will be tuesday of kliwon, friday of kliwon, and sunday of kliwon.

Etnomathematics in deciding auspicious day for wedding.

Based on the statements explained above, it can be concluded that there are several activities about doing mathematical activity. Here are some examples of the mathematical activity which is related to the process of calculating an auspicious day in Javanese culture:

1. Value of day and *pasaran*.

Each day and each *pasaran* in javanese culture have a certain value, for example, thursday has value of 8, saturday has value of 9. Based on this fact of value, it is stated that javanese society has been doing Mathematics.

2. Deciding an auspicious day for javanese wedding.

In deciding an auspicious day for javanese wedding, the society can take either birth day of the bride or the day which is even sequence. Based on this fact, the javanese society has already been knowing the pattern of even and odd number. Therefore, the javanese society has already been doing Mathematics in their daily life.

3. The rule of deciding an auspicious day.

Based of the result of the interview, the rule of deciding an auspicious day can be calculated by the formula, as follows:

$$x = \frac{a + b}{4}, \text{residue } 1 \text{ or } 2$$

Which are $x = \text{devided number}$

$a = \text{netu day}$

$b = \text{netu pasaran}$

Potential of Etnomathematics which can be developed in learning activity

Based on the result of the research, it can be stated that there are several potentials which can be developed in learning mathematics. One of them is related to the rule of calculating an

auspicious day for wedding. The rule can be developed by the teacher, as a sample question in game format purposed for improving the creative mathematical thinking pattern, for example: “*Bambang and Yuli is javanese future bride and groom using calculating an auspicious day process for their wedding. They come to see Mbah Marijo (one of the elders in that village), in order to ask the auspicious day for their wedding. Bambang was born on Saturday of Wage and Yuli was born on Sunday of Pon. Help mbah marijo to answer some questions from Bambang and Yuli, as follows:*

- a. *Is it possible to get married on Sunday?*
- b. *If they want to get married on Desember 2016, what date will be match for throwing their wedding?”*

Beside, it can be improving critical thinking pattern, it is also expected that connecting the culture to mathematics can be improving the students’ motivation in learning Mathematics.

Conclusion

Based on the result of the research, it is concluded that calculating an auspicious day for wedding is included into doing mathematical activity based on the rule of deciding an auspicious day. The formula of deciding an auspicious day for wedding is as follows:

$$x = \frac{a + b}{4}, \text{residue } 1 \text{ or } 2$$

Which are $x = \text{devided number}$

$a = \text{netu day}$

$b = \text{netu pasaran}$

Furthermore, it has a potential developed in learning Mathematics in the classroom, for example in material of number or residue theory. The teacher can be developing the theory as sample question in game format purposed for improving the creative mathematical thinking pattern. Beside, it can be improving critical thinking pattern, it is also expected that connecting the culture to mathematics can be improving the students’ motivation in learning Mathematics.

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