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Article

Study of Ethno-mathematics and Vygotsky's Constructivism on Jambi Traditional Marriages

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Abstract

The mathematical aspects of the Jambi traditional wedding ceremony are related to the process of assimilation and accommodation (constructivism theory) as well as ZPD and scaffolding (Vygotsky's theory of cognitivism). This study aims to examine the mathematical material contained in the Jambi traditional wedding ceremony so that it becomes knowledge that can be applied in schools. The research design used is an ethnographic qualitative research design. Ethnographic qualitative research researchers will obtain data through interviews, observation, and documentation. The sample selection from this research used purposive sampling technique. Based on these criteria, the sample of this study was 6 couples who married using Jambi traditional wedding ceremonies in July and August 2021. The instruments in this study were interviews, observations and supported by documentation. The data that has been obtained through interviews, observations, and documentation are then analyzed using analytical techniques using the Miles & Huberman based on a predetermined code in the form of a color code that is done manually. The results showed that the mathematical aspects contained in the Jambi traditional wedding ceremony consisted of aspects of counting, measuring, placing, designing, playing and explaining.

Keywords

Ethno-mathematics • Vigotsky Constructivism • Mathematics • Wedding Ceremony

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Learning mathematics is a part of everyone's culture and daily habits (Hammoudi, 2020; Irawan et al., 2018; Widada et al., 2018; Worthington & van Oers, 2016; Zengin, 2018), which is surrounded by multifarious problems. It is necessary to identify, control, and prioritize solving problems of learning mathematics related to culture (Barba, 2018; Díaz, 2017; Naik & Garge, 2021). Studies that examine mathematical ideas in various cultural activities in recent decades are known as ethno mathematics. Ethno-mathematics is a term from mathematics that is practiced by cultural groups, one of which is indigenous peoples. The meaning of mathematics in ethno-mathematics is where mathematics in a culture can survive and develop, and that refers to techniques, such as counting, sorting, measuring, weighing, coding, clarifying, inferring and modeling (Ma, 2010; McCulloch et al., 2018; Sierpinska, 2013). Different cultures can discuss mathematical practices such as counting, grouping, designing shapes, measuring, and others (Alsina et al., 2021; Mellone et al., 2019; Nieminen & Pesonen, 2020).

In Indonesia, the study of ethno-mathematics can be studied in the context of several provinces including the Jambi Province, chosen for this study. One form of local culture in Jambi that is often studied with mathematical aspects is the traditional wedding ceremony. Traditional wedding ceremonies are unique traditions in each region that contain very broad and strong values and norms, regulating and directing the behavior of each individual in society (Chisholm Hatfield et al., 2018; Deda & Amsikan, 2019; Raji et al., 2017). Therefore, ethno-mathematics can be studied in depth on the development of culture in Jambi Province. From the ethno-mathematical side, there are several stages of the Jambi traditional wedding ceremony that can be studied such as handing over to the bride and groom, measuring the stages of marriage with the concept of multiples, multiplication, and measuring the location of wedding activities (Long & Chik, 2020; Safitri et al., 2021; Utami & Sayuti, 2019).

This study was conducted to examine the mathematical aspects of the traditional ceremonies of the Jambi community and to determine the relationship between the mathematical aspects of the Jambi traditional marriage ceremony system and Vygotsky's constructivist learning theory. The urgency of this research is to improve the learning process through traditional wedding ceremony activities of the Jambi community which are integrated into mathematics or called ethno-mathematics with Vygotsky constructivism so that students can know and understand that mathematics learning can be linked to the culture that exists in human life.

Literature Review

Ethno-mathematics in addition to Indonesia is also widely discussed in other countries. As in Giorgetti's research, Meşeci Giorgetti et al. (2017) conducted research on Turkish culture and education with the aim of looking back at culture through education, where culture can be defined broadly or narrowly which in the edition of *Paedagogica Historica* considers culture as a way of life and a way of thinking. community and educational institutions, educators, and educational materials. Dosinaeng et al. (2020) examined the exploration of mathematical elements found in the culture of the Boti tribe in Timor to help students learn mathematics realistically and also introduces the Boti culture to more people. Mosimege (2012) conducted research on ethno-mathematics where ethno-mathematics contributes to the demystification of the history of false projections by colonialism that Africa was not culturally embedded in mathematics. A research conducted by Shirley and Palhares (2013) examines how ethno-mathematics was implemented in learning in cross-cultural projects where cultures from various countries, namely Nepal, Tibet, and China were directed towards ethno-mathematics. Chahine and Kinuthia (2013) stated that ethno-mathematics has a role as a translator and interpreter of the mathematical structure inherent in the indigenous culture used by the South African population and disseminated by the Zulu Culture which underlies major breakthroughs in the field of mathematical knowledge.

Apart from being seen from the ethno-mathematics side, Jambi's traditional wedding culture can also be studied using Vygotsky's constructivism. Constructivism is not a new educational theory but a learning theory that always puts forward the denial of logical and conceptual development. It provides a learning view that knowledge is not only given by a teacher (Kambara, 2020; Tan, 2017; Thompson, 2015) but the construction of knowledge also hails from students' understanding of the mathematical concepts occuring through a process of assimilation and accommodation (Kirch, 2014; Liu & Matthews, 2005; Sanders & Welk, 2005). The educational thought of constructivism was popularized by one of the most famous constructivist theorists, namely Lev Vygotsky (Jeung & Kellogg, 2019; Thompson, 2015; Yin et al., 2020). The relationship of culture to mathematics

learning is related to Vygotsky's constructivist learning theory. There are 2 important aspects of Vygotsky namely the more knowledgeable other person ('MKO') and the zone of proximal development ('ZPD'), but Vygotsky's distinctive feature emphasizes the role and influence of the social world for cognitive development into learning (Barrs, 2017; Lewis, 2018; Shvarts & Bakker, 2019). Constructivism according to Vygotsky's view can be studied in the traditional marriage culture of the Jambi community as learning for students to improve students' intellectual development in cultural abilities which can be a real manifestation of the application of mathematical concepts.

This study was carried out to complement previous research. Dominikus et al. (2016) conducted a research on the marriage tradition on the island of Adonara which is associated with ethno-mathematics, where there are elements such as counting, measuring, comparing, sorting, and about the concept of geometry. Then Selviani et al. (2021) conducted a study which stated that the Geometry material for students with high mathematical abilities explained that Vygotsky constructivism helped students in increasing mathematical abilities which had an impact on increasing students' problem solving abilities. A research conducted by Fouze and Amit (2018) explains the relationship between Vygotsky's theory and the ethno-mathematical approach which emphasizes the importance of student interaction with cultural values where students acquire cultural mathematical concepts from the environment that will be useful in improving students' critical thinking.

Methods

Research Design

The research design used in this study is a qualitative ethnographic research design. Ethnographic qualitative research design is interpretative and naturalistic research. In this study, researchers took data directly to the research location, namely where 6 married couples used Jambi traditional wedding ceremonies so that naturalistic data were obtained. In ethnographic qualitative research, researchers will obtain data through interviews, observations or observing events and through field notes or documentation. In this ethnographic qualitative research design, these 6 couples were married couples using a traditional Jambi wedding ceremony and interviews through traditional leaders because they were informants who were fully enculturated with Jambi culture.

Research Sample

The sample selection from this research used purposive sampling technique because this technique caused the sample to be diverse and not in accordance with the research objectives. The basic criteria for selecting the sample were couples who had married using Jambi wedding customs. Based on these criteria, the sample of this study comprised 6 couples who had got married in July and August 2021 according to the Jambi traditional wedding ceremony.

Research Instruments and Procedures

The instruments in this study were interviews, observations and documentation. In the interview instrument, the researcher interviewed traditional leaders, traditional stakeholders, and traditional institutions regarding the Jambi traditional wedding ceremony procession which contained all explanations about the activities during the Jambi traditional wedding procession. The purpose of the interview was to find out in detail the procession during the Jambi traditional wedding so as to facilitate the classification of ethno-mathematical values in Jambi traditional wedding activities where each stage during the procession will be asked. The observation instrument of this research ensured the compatibility between the observed activities and the activities that should be carried out in the observed activities. The observation instrument used by the researcher aimed to see the suitability of the activities observed directly with the suitability of the results of interviews with resource persons. The observation instrument provided an overview of the activities carri out during the Jambi traditional wedding ceremony procession, especially in the Labuh Leh and Serah Terimo processes.

The validity of the interview instrument and the observation instrument were validated by expert judgment in the field of ethno-mathematics as exhibited in Table 1. It provides an overview of the activities carried out during the Jambi traditional wedding ceremony procession, especially in the Labuh Leh and Serah Terimo processes.

Table 1. *Observation grid*

Aspect	*Sub Aspect*	*Indicator*	*Descriptor*
The suitability of the information provided by the source	Observation	1. Stages of Labuh Lek	1. Customs filled in the form of
		a. Filling the Traditional Menung *Lembago*	a. Spear
			b. Tune in
			c. gold scales
			d. Mas 3.5 tail
			e. Seven-tailed eagle
			f. duo outfit
			2. The institutions that are poured are in the form of
			a. Seejor buffalo
			b. a goat
			c. a chicken
			d. 100 bushels of rice
			e. Rice 200 bushels
			f. Handful of rice
			g. 100 ropes
			h. Coconut 20 ropes
			i. Kelapo setali
			j. Fat as sweet and sour as fresh
		b. Solemnization of a marriage	1. Acceptance of terms and conditions
			2. Dowry
		2. Bride Receipt Handover Stage	1. Say *Serayo*
			2. Groom pick up
			3. Wine and *pencak silat* accompaniment
			4. Welcoming in the yard of the bride's house
			5. Bride and groom handover ceremony at *Balairung Sari*
			6. *Lanse* opening event
			7. Events at the weighing scale
			8. Events at the swing
			9. Buffalo head stomping event
			10. Sweet coconut milk shower
			11. Events at the *gonjong* house
			12. Show event
			13. Events at *putro ratno*
			14. *Sapat* rice feeding event
			15. *Iwa*
			16. Prayer

The interview instrument contained the processes in Jambi traditional marriages such as the Labuh Leh process and the handover *termo*. The grid of interview instruments regarding Jambi traditional wedding ceremonies can be seen in Table 2.

Table 2. *Interview grid*

Jambi Community Wedding Ceremony Process	*Mathematical Aspects in Ethno-mathematics*	*Descriptor*
Ijab Kabul (Labuh Leh)	1) Explaining	*1)* Explain the process carried out at the time of consent (*labuh leh)*
		2) Know the terms and conditions
		3) Explains what must be done if any of these terms and conditions are violated
		4) Know the tools and materials needed
	2) Counting	5) Knowing the number of tools and materials needed
		6) Knowing whether or not there are provisions regarding the number of tools and materials needed
	3) Measuring	7) Know the size of tools and materials needed.
		8) Knowing whether or not there are provisions regarding the size of the tools and materials needed.
		9) Knowing the implementation time and the provisions of this stage.
		10) Explain the terms of implementation at this stage.
	4) Locating	11) Knowing whether or not there is a place navigation process.
		12) Know the places that can be used at this stage.
		13) Know the provisions of the navigation of the place.
Uluh Delivering Bride and Groom Receipts	1) Explaining	1) Explains the process carried out when Filling the *Lembago* Pouring Tradition
		2) Know the terms and conditions.
		3) Explains what must be done if any of the terms and conditions are violated.
		4) Know the tools and materials needed.
		5) Explain the provisions regarding the number of tools and materials needed at this stage.
		6) Explain mean contained in every step and the selection of tools and materials at this stage.
	2) Counting	7) Know the number of tools and materials needed.
		8) Knowing whether or not there are provisions regarding the number of tools and materials needed.
	3) Measuring	9) Know the number of tools and materials needed.
		10) Knowing whether or not there are provisions regarding the size of the tools and materials needed.
		11) Knowing the implementation time and the provisions of this stage.
		12) Explain the terms of implementation at this stage.
	4) Locating	13) Knowing whether or not there is a place navigation process
		14) Know the places that can be used at this stage.
		15) Knowing the conditions of place navigation
	5) Design	16) Knowing whether there is a building design process at this stage.
		17) Describe the building design process involved at this stage.
		18) Knowing whether or not there are provisions regarding the form and design of the building
		19) Explain what the terms are.

Data Collection

The next stage was data collection carried out in research where data was obtained through interviews with traditional leaders, traditional stakeholders and traditional institutions, followed by observations of Jambi traditional wedding ceremonies carried out on 6 couples who had married using Jambi traditional wedding ceremonies, and triangulated form the documentation and wedding photographs. After all data was collected, it was reduced to fit in the criteria set by the researcher to produce data more specific and related to the research. The researchers also did the coding to make it easier for researchers to process and analyze research data from interviews in order to be more detailed. After these stages of data reduction, the researcher displayed the data in a narrative form so that the results of data reduction can be well structured and have a pattern of relationships so that the research results were easy to understand. After the data was presented, it was verified and conclusions were drawn to make more credible conclusions evidenced through the verification stage.

Data Analysis

The data obtained through interviews, observations, and documentation were analyzed using the analytical techniques used in the Miles & Huberman model. This analysis went through several stages, including collecting data, reducing data, displaying data, concluding and verifying (Miles & Huberman, 1994). Miles and Huberman's qualitative research distinguishes analyzing data based on different types and code names so that it will be easier to analyze (Elliott, 2018; Onwuegbuzie & Weinbaum, 2016). Hence, when the stages after the data was collected, it was compiled based on a predetermined code in the form of a manual color code. The colors were classified based on aspects that were in accordance with aspects of the observation instrument at the Jambi traditional wedding ceremony. After being grouped by color code, the results of the color code were analyzed. From the analysis, the mathematical value was known in the anchoring and handover process.

Results

This study was conducted to analyze the mathematical aspects of Vygotsky's constructivism with respect to the learning theory of the Jambi traditional wedding ceremony. The results of this research data obtained from observations and interviews. The results of the observations can be seen in Table 3.

Table 3. *Observation Results*

Wedding couple	*Indicator*		
	Lek Anchor Stages		*Bride and Groom Handover Stage*
	Filling the Traditional Menung Lembago	*Solemnization of a marriage*	
1			
2			
3			
4			
5			
6			

After obtaining the results of the observations as shown in Table 3, the interview results were analyzed, as seen in Table 4 which summarizes the interview results from several sources.

Table 4. *Interview Results*

Question	*Answer*
When is the time for the anchoring event process?	The anchoring event is held in the month of Shawwal-dzulhijjah
Is there a place navigation process at the consent stage (Labuh Leh)?	Yes, there is a place navigation process at the Kabul consent stage (Labuh Leh) where this is one of the measuring aspects contained in the procession stage of the Jambi traditional wedding ceremony.
How is the location used for consent (Labuh Leh)?	The location that can be used can be determined according to the Jambi traditional wedding ceremony procession.
What are the provisions of determining the location at the consent stage (Labuh Leh)?	The rules are starting from ordering *Serayo* at the Balairung Sari, opening the landscape in the bridal room, weighing and swinging in the yard of *Gonjong*'s house, going up to *Gonjong*'s house and going to *Putro Retno*.
What are the provisions for measuring the amount/quantity (of food) in the Jambi traditional wedding ceremony procession?	The volume of rice is expressed in bushels because it is generally calculated in kg.
Are there any provisions in the form and design of the building?	There is
Explain the provisions in the form and design of the building?	The *gonjong* house is a penthouse with five pillars about 3 m high. Cover the fibers in the shape of a pentagon pyramid. Approximately 2 m on each side of the base with a diameter of 3 m. On each side installed 2 pieces of carving with a size of 1 mx 0.5 m. Generally, the funds needed to build this building are around 25 million. While *Putro Retno* is a rectangular building with 4 pillars. Ideally measuring 6 mx 8 m. Has a level of 3/5 according to the custom that is filled and the *Lembago* is poured. The roof is shaped like a triangular prism. The top is decorated with 3 cans that have an ideal length of 4 m. The bowl used uses a lotus flower motif that is characteristic of Jambi.
How are length, width and height measurements taken when designing the *gonjong* and *Putro Retno* houses?	The *gonjong* house is in the shape of a pentagon with a circumference of 2 m on each side of the base, 3 m high, and on each side there is a carving measuring 1 mx 0.5 m. The length and width of the roof are adjusted to the size of the base and the height of the roof is about 1 m. *Putro Retno* has a rectangular shape with several levels. The ideal size is 6 mx 8 m with a height of about 3 m. The roof is in the form of a triangular prism that is adjusted to the size of the base with a height of about 1 m. The decoration above uses 3 trays with sizes that are adjusted to the area of *Putro Retno*. For the ideal size the tube is 4 m long.
How many tools and materials are needed in the process of performing the *ikat buik promise semayo*?	There are 3 types of tools in the process of performing the *ikat buik promise semayo,* namely two rings, a piece of *rattan* and two graduation gowns.
Are there any provisions regarding the number of tools and materials needed in the *sitting betanyo* process?	Yes, there exists such a provision.
What are the tools and materials needed in the process of Filling in the Traditional Pouring of *Lembago*?	1. The tools and materials in the customs that need to be fulfilled include a matching rifle, spear, gold scales, 3.5 tails, seven eagles, and duet clothes. 2. While *Lembago* is poured into several levels, namely the first level (full) *Lembago* included the form of buffalo, 100 bushels of rice, 20 coconut ropes, as sweet as fresham and seasam;

	3. *Lembago* level II consisted of a goat, 20 bushels of rice, 20 coconut ropes, as sweet as fresh sea tamarind; *Lembago* level III consisted of chicken, fresh rice, coconut *setali*, and *selemak* as sweet as fresh sea tamarind. 4. The terms that exist in *adat* and *Lembago* such as nada, mace, a, a basket, and string are numerical terms that indicate the number one that is adjusted to the object. 5. The numbering such as seven heads (7), all-duo outfits (2), 100 bushels of rice (100), 20 bushels of rice (20), 100 coconut ropes (100), and 20 coconut ropes (20) were the usual form of numbering in different units. The gold count of 3.5 tails was equal to 7 gold tribes or 73 grams of gold. The calculation of one coconut rope was equal to 2 coconuts.
Are there/no provisions regarding the number of tools and materials needed in the process of Filling in the Traditional Pouring of the *Lembago*?	Yes, there exists such a provision.
What are the terms and conditions in filling out the custom of pouring *Lembago*?	1. In the Jambi traditional wedding ceremony procession, there are separate rules regarding the number of invitees invited according to the customs that are filled in and the *Lembago* that is poured. 2. If *adat* is filled in and *Lembago* is fully filled, the number of invitees is likely to be around 1000 people. 3. If *adat* is filled in and the institution is poured into the medium (half full), then the number of invitees is probably around 100-200 people. 4. Meanwhile, if the *adat* is filled in and the *Lembago* is poured sufficiently, then the number of invitations may only be around 6-10 people (only the main family members of the bride).
Explain the terms and conditions in the handover between the bride and groom?	At the stage of the handover of the bride and groom, the process begins with *Serayo*, the bride's grandmother leaving supplies to the grandmother to pick up the groom. Then the groom is picked up and paraded to the bride's house. Arriving at the bride's house, the groom was greeted by the bride's grandmother. Then, turmeric rice is sprinkled as a welcome and the bride and the groom are handed over in the sari hall. The activity concludes with an open ceremony by the groom to pick up the bride who sits in *Putro Retno*. As a gift, the bride is given a ring.
Explain the things that must be done if any of the above terms or conditions are violated?	If *adat* is filled and *Lembago* is fully filled, *Putro Ratno's* roof has 5 levels, otherwise, it *adat* is filled in but the *Lembago* is not fully poured, *Putro Retno* has 3 levels
What tools and materials are needed in the handover between the bride and groom?	Turmeric rice is sprinkled as a welcome and a ring is given as a gift.
Explain the meaning contained in each step at the stage of the handover between the bride and groom?	The bride and groom are taken to the weigh-in to weigh themselves as a symbol of prosperity for their food needs. Then they proceed to the swing. The bride and groom are swung 5 times while being given advice. This is a symbol for them to practice the 5 pillars of Islam. The event continued by stepping on the buffalo's head and washing the feet with sweet coconut milk. After that, the bride goes

	downstairs to the *bagonjong* house which is the house of five symbols or the 5 pillars of Islam with a palm fiber roof as a traditional symbol that does not escape the rain and is never hot.
Is there a place navigation process at the Bride and Groom Handover Delivery stage?	Yes, there is a procession of navigating places at the stage of the Handover of the Bride and Groom.
How is the location that can be used as the location for the Handover of the Bridal Receipt)	Aspects of placement in the Ulur Inter-Delivering Terimo Bride stage or in the traditional wedding ceremony procession of the Jambi community relates to the question "where".
What are the provisions of determining the location at the stage of Handover Between Bridal Receipts	The location provisions at the stage of the Handover of the Bride and Groom's Handover involve finding the way, navigation, orientation or location using Cartesian coordinates or polar coordinates or repetition rules.
Is there a building design process at the stage of Handover Between Bride and Groom Receipts?	Yes, namely the design of the *gonjong* house and *Putro Retno*
Explain the process of designing a building that is contained in the stage of Handover Between Bride and Groom Delivery?	In designing the house of Retno*'s gonjong* and *putro*, geometric concepts are indirectly used. Starting from measuring the length, width, area, the circumference of the flat surface is measured, which can be expanded to determine the surface area and volume of the shape.

Discussion

Jambi traditional weddings are a wedding ceremony that is held using Jambi customs. The results of the observations obtained stated that the Jambi traditional marriage had 2 stages, namely the stage of Labuh lek (filling in the custom of Menung *Lembago* and Ijab Kabul) and the stage of handing over the receipt of the bride and groom. Based on observations obtained from 6 bridal couples, it was stated that only 3 couples performed the entire procession of the Jambi traditional wedding ceremony and 3 other couples did not perform the Jambi traditional wedding ceremony procession. The procession that was not carried out by the 3 bridal couples was an event at the scales**,** the event at the swing, the event stepping on the buffalo's head, and the event at the *gonjong* house. The reason for not holding the event was limited funds available. The procession of the Jambi community's traditional wedding ceremony is completely carried out by the official's son or the king's son.

The results of the observations obtained were strengthened by the results of interviews obtained from several sources, where the participants explained how the procession of the Jambi traditional wedding ceremony carried out by the bridal couple was in accordance with the Jambi traditional wedding ceremony. Through the results of observations and interviews, it can be studied the mathematical aspects that exist in the Jambi traditional wedding procession. The mathematical aspects studied in the Jambi traditional wedding ceremony procession are the calculation aspect, the measurement aspect, the location determination aspect, the designing aspect, the playing aspect, and the explaining aspect.

In the traditional wedding ceremony procession of the Jambi community, the calculation aspect can be found in the performance of the *ikat buik* promising *semayo, labuh lek* (traditional filling of the *Lembago*), and the handover of the bride and groom. The word count used in the Jambi traditional marriage ceremony system which can be expressed as natural, odd, even numbers which is a number concept based on their experience and life needs. In the performance of the *ikat buik* Promise *Semayo*, there is a concept of multiplication of two that has been unconsciously carried out, where if a man gives a ring in the form of split rattan and a graduation gown, according to this law, it must be replaced with two rings of a piece of rattan and two graduation clothes. At the stage of filling out the *Lembago* custom, there is a calculation process based on the level of the *Lembago* custom. Then the stage of handing over the receipts of the bride and groom there is also a counting process, such as the step of asking *Serayo* to leave the umbrella with the legs and graduation clothes. So that the counting aspect in the traditional wedding ceremony procession of the Jambi community is carried out to answer the question "How much" related to the means of counting and counting (Meilink-Roelofsz, 2012; Rowlands & Carson, 2002; Walthall, 2008).

Measurement aspects are also found in almost every stage of the Jambi traditional wedding ceremony procession. In the betel music performance, there is a process of measuring the amount of food. Unconsciously, they use the concept of a linear program to determine the funds needed to prepare food ingredients. The stage of binding the *semayo* promise is carried out to determine the duration of sowing. Planting is done based on the rice harvest interval (6 months) or the corn harvest interval (3 months). Here people already understand the use of the concept of counting time and months. Measurement of the amount/quantity (of food) is also found in the traditional wedding ceremony processions of the Jambi community, such as in determining the volume of rice. So that indirectly people have used the concept of units of measurement for volume and weight of objects. There are also measurements regarding the customs that are filled in and the *Lembago* that is poured. In this case, too, the concept of linear programming is used. Measurements of length, width and height are carried out when designing the *hobo* and *Putro Retno*. People unconsciously explain things by measuring the length, width, circumference and area of a flat shape in order to understand it. Other aspects of measurement (measuring) are related to the question “how much” (length, width, function, time/duration, quantity/lot). The measure of quantity relates to the amount of cloth, food, land, or money. In accordance with the definition that measuring is an activity that is usually carried out in the process of buying and selling/bartering, designing and determining the height, length, circumference, breadth, depth,

The measurement aspects are contained in several stages of the Jambi traditional wedding ceremony procession, that are handed over to the bride and groom when the location of the activity has been determined. Activities and locations are determined according to the Jambi traditional wedding ceremony procession. It can be used as learning material or context to study distances and positions in the given order, location positions are set so that distances can be determined. In addition, this location is on the *Besanjo* stage. *Besanjo* is the activity of visiting relatives after the Kabul approval and wedding reception are carried out. *Besanjo* begins by determining the location used for the route, determining the direction of the destination, and adopting the right and fast way to home. It can be seen as a learning material and context in studying the concepts of position, distance, speed, and acceleration. The placement aspect in the Jambi traditional wedding ceremony procession is related to the question "where". This aspect involves finding your way, navigating, orienting yourself, and explaining where things are related to one another. Mathematically, the determination of location or location uses a Cartesian coordinate system or polar coordinates or repetition rules (Fouze & Amit, 2019; Katsap & Silverman, 2016; Powell & Frankenstein, 1997).

Moreover, the aspects of designing were elated to planning and implementation in designing a building. This design aspect existed at the time of designing the house of *Gonjong* and *Putro Retno*. In designing the house of Retno's *gonjong* and putro, for example, geometric concepts were indirectly used. Starting from measuring the length, width, area, and circumference of a flat shape were expanded to determine the surface area and volume of the shape. The concept of linear programming was also applied to the design process of a building. It helped them to determine the funds needed, minimize funds, minimize the materials needed, and material to be used. This building design was used as a project for students. By designing this building students better understood the application of the mathematical concepts they were learning and students became more familiar with local culture. Aspects of design (design and building) also existed in the procession of traditional community wedding ceremonies, which were a few of the most important forms in geometry, where form comes from designing objects to serve different purposes. The object may be small and mundane, like a spoon, or even symbolically important like a temple but they were also mathematically linked with shapes and designs with different properties (Mesquita et al., 2011; Rosa & Orey, 2011; Zepp, 1993).

The aspect of playing in the procession of the Jambi traditional marriage contract was at the stage of playing the betel joke. This stage was the stage of introducing young people where one of the introduction media was through a game called the "koset" game. The name of this game corresponded to the tool used in the game, namely matches or in Jambi language called koset. This game was usually done by young children in pairs at a wedding ceremony. In this game, the community indirectly used the concept of grouping even/odd numbers and a profit and loss system. The aspects of this play contributed to the development of mathematical thinking; however, not all games were important from a mathematical point of view, since there were a few puzzles, logical paradoxes, and games.

It was also found that in the procession of the Jambi traditional wedding ceremony, there was the handover stage of the bride and groom. There were several other things that needed to be explained, namely at

the stage of the handover of the prospective bride and groom, included the groom being picked up on the orders of the *Serayo* and paraded to the bride's house. He was greeted there by the bride's grandmother, sprinkled with turmeric rice. Before the handover of the bride and groom in the sari hall, there was an open ceremony in which the groom picked up the bride who was sitting in *Putro Retno*, and gave a ring as a gift. This explanatory aspect can be used as context, perception, or overview in learning for linear programming concepts, geometry, distance, and position. The explaining aspect relates to understanding why something happened the way it was done.

The mathematical aspects contained in the traditional wedding ceremony of the Jambi community can also be associated with Vygotsky's Constructivism. Constructivism according to Vygotsky's view emphasizes more on cultural influences. Aspects of constructivism are carried out through two processes, namely assimilation and accommodation (Ernest, 2010). Assimilation is a cognitive process in which a person integrates new perceptions, concepts, or experiences into existing schemas or patterns in his mind. If one cannot assimilate new experiences with schemas then accommodation will occur. Mathematical aspects in the traditional Jambi wedding ceremony system related to Vygotsky's theory of constructivism included aspects of counting, measuring, location, designing, playing and explaining.

The aspect of counting in the assimilation process contained the calculation of the number of coconuts needed when pouring *Lembago*. By utilizing this concept, the multiplication was taught. In addition, the numbering process in the swinging process was the assimilation process that could be used as a reference in teaching the types of numbers and the concepts of sequences and series. The aspect of measuring in the assimilation process was contained in determining the expenditure of men when visiting women's homes, calculating the customs that were filled and the *Lembago* that were poured, as well as measurements in designing the houses of *gonjong* and *Putro Retno*. The people seem accustomed to estimating the funds needed for the wedding ceremony, the number of tools and materials that were used in building the *gonjong* house, and how to minimize expenses.

The location aspect in the assimilation process was at the *Besanjo* stage. When visiting from one relative's house to another, the distance and travel time were generally estimated. It could be used as material to teach the concepts of position, distance, velocity, and acceleration in learning. The aspect of building design in the assimilation process occurred during the process of building the house of *Gonjong* and *Putro Retno*. People measured the length, width, area, and circumference of a flat shape and recognized the shapes of these flat buildings, such as a rectangular house and a rectangular *Putro Retno*. This knowledge was used as a basis for teaching geometry and three-dimensional concepts in learning mathematics.

The play aspect in the assimilation process occured when young people played the game of koset. At that time people understood the difference between odd and even numbers. This habit was the basis for teaching the concept of numbers in learning mathematics. The aspect of explaining the assimilation process was involved in determining the number of invitations that must be distributed according to the customs that were filled in and the *Lembago* that was poured. It was also used as a reference material to learn linear programming concepts.

The mathematical aspect with Vygotsky's constructivism was thus studied at the traditional wedding ceremony of the Jambi community. This is consistent with several previous research studies. For instance, Nuh and Dardiri (2017) regarded Ethno-mathematics in the Numbering System in the Riau Malay Society focused on research on the counting system in the Riau Malay community. Likewise, Fitriani et al. (2019) associated Ethno-mathematics with Number Operating System in Javanese Community Activities. The results obtained showed that Javanese calculations used mathematical concepts in the form of modulo numbers 5 and 7 for wedding activities, and modulo number 4 for the activities of building a house, moving, circumcision, and anger. Another research on ethno-mathematics was carried out by Vasquez (2017), who studied ethno-mathematics as a branch of science that discussed language, behavior, and practice where ethno-mathematics took a role of an epistemological driver in education. Furthermore, research conducted by Shirley and Palhares (2013) examined how ethno-mathematics was implemented in learning in cross-cultural projects where cultures from various countries were directed towards ethno-mathematics. In addition, Patri and Heswari (2021) examined the application of e-module ethno-mathematics integrated with culture in the city of Sungai Penuh where the integrated culture was the form of the great mosque in the city of Sungai Penuh.

D'Ambrosio and D'Ambrosio (2013) examined learning in education using ethno-mathematics and found that it led to the discovery of new facts about society and culture, especially in traditional games. Kusuma et al. (2017) examined the depth of the application of ethno-mathematics in playing an important role in the life of

community and school students in the Cipatujah area. In addition, research conducted by Makur et al. (2020) examined the application of culture and mathematics in society where examples of applied culture were the geometric patterns and motifs of the *Manggarai* tribe that were associated with mathematics. The research conducted by Rubio (2016) examined the ethno-mathematical practices commonly used by the *Kabihug* tribe in the Philippines where the mathematical values included counting, encoding, measuring, classifying, sorting and concluding.

However, no previous researchers had studied ethno-mathematics with Vygotsky constructivism in Jambi traditional wedding ceremonies. Through this study, it is evident that mathematical aspects were used in the Jambi traditional wedding ceremony. Besides, learning theories were also studied, namely Vygotsky's constructivism. This research collected information and explained in full the procedures for the traditional wedding ceremony of the Jambi community in order to reveal the mathematical aspects that existed. This study established the relationship between culture, interaction, and the learning process.

Conclusion and implications

The form of local culture in Jambi is the traditional wedding ceremony, which is a unique tradition in this region. Traditional wedding ceremonies are cultural elements that contain very broad and strong values and norms, and regulate and direct the behavior of each individual in society. The relationship between the mathematical aspects of the Jambi traditional wedding ceremony and the mathematics learning theory is in the arithmetic aspect. This aspect is found in the weaving of the *buik* promise *semayo*, the *labuh lek* (custom filling for the *Lembago*), and the delivery of the bride and groom. There are stages of playing betel quirks, *ikat buik* promising *semayo*, *labuh lek* (traditional filling for pouring *Lembago*), and between bride and groom reception. There are design aspects found at the stage of the bride's handover, namely designing the *gonjong* and *Putro Retno* houses. The game aspect included the betel game stage, and the explanatory aspect. This aspect was in the stage of *Labuh lek* (custom filling for pouring *Lembago*), and the handover of the bride and groom. These aspects relate to the process of assimilation and accommodation (constructivism theory).

The results of this study are not only beneficial for the culture itself but also for the world of education. It is hoped that the results of this study can be used as a context or used in formal mathematics learning in schools as an effort to introduce Jambi traditional wedding ceremonies to students so that students know Jambi culture and love Jambi culture. again. This study would also prove a very important update in education, not only for learning in Indonesia but will also be useful globally to study ethno-mathematics in any local traditional ceremonies with Vygotsky constructivism. For the world of education, it is hoped that the results of this study can be used as a context or used in formal mathematics learning in schools as an effort to introduce Jambi traditional wedding ceremonies to students so that students know Jambi culture and love Jambi culture. again.

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