



The Profile of Communication Mathematics and Students' Motivation by Joyful Learning-based Learning Context Malay Culture

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

Article Information

DOI: 10.9734/BJESBS/2016/25521

Editor(s):

(1) Alina Georgeta Mag, Department of Private Law and Educational Science, University of Sibiu, Romania.

Reviewers:

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(3) Utku Kose, Usak University, Turkey.

Complete Peer review History: <http://sciencedomain.org/review-history/14432>

Original Research Article

Received 7th March 2016
Accepted 12th April 2016
Published 3rd May 2016

ABSTRACT

This research was a descriptive qualitative study conducted in three phases, namely the pre-court stage, the stage of field work and data analysis stage. Subjects in this study were six students of class VII MTs Yaspi Medan Labuhan with two subjects capable of good mathematics communication, two subjects capable enough communication, and the two subjects capable of communication was less, the selection of subject by using *purposive sampling*. The research results were obtained: 1) There was a positive change in the students' ability to communicate mathematics after being given a context-based *joyful learning* the Malay culture; 2) The responses of the students showed subjects could communicate more math problems after being given a context-based *joyfullerning* the Malay culture; 3) Students' motivation had to experience a positive change because this learning is a new thing for students and fun for students. Recommended by the teachers can use context-based *joyful learning* culture by presenting issues related to local culture as an alternative learning.

Keywords: Mathematical communication ability; motivation; joyful learning; Malay.

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1. INTRODUCTION

Fakhrudin [1] Learning is a process of behavior change due to experience and practice. Septiani, et al. [2] Education in schools today not only serves to create students who are academically smart, but also to be able to shape the character of each individual. Putrawan, et al. [3] Improving the quality of education aimed at improving the quality of human resources. It is necessary for the update on an ongoing basis in the field of education for the realization of the next generation of educated and have a noble character. In mathematics learning activities in school mathematics learning capabilities greatly needed attention especially communication skills with the opinion mathematic. According to Saragih [4] development of the field of information and communication technology very rapidly today, is inseparable from the development of the intellect people. As a result of advances in communications technology and information, the flow of information coming from different corners of the world quickly and diversely. To show the performance in the ever-changing circumstances and competitive, it needs to be able to get, select and manage information, the ability to be able to think critically, systematically, logically, creatively, and the ability to be able to work together effectively.

Rahmawati [5] Communication mathematics is defined as a student's ability to deliver something that is learned through dialogue or mutual relations of events that occur in the classroom environment, where there is a transfer message. The message contains the material students are learning math, for example in the form of concepts, formulas, or a problem-solving strategies. Communication is a process of shared meaning through verbal and non-verbal behavior. According to Saragih and Rahmiana [6] Communication in general can be interpreted as an event to convey the message or the information to each other within a community. In the teaching and learning activities in the classroom will always be communicated between students and teachers, students and teachers as a learning center or as a facilitator. The success of the learning program is influenced by a form of communication used by teachers when interacting with students. Meanwhile, according to Guerreiro and Serrazina [7] mathematical communication is a tool in the transmission of knowledge of mathematics or as building blocks in constructing mathematical knowledge. In this

case means mathematical communication skills can be defined as the ability of a person to the disclosure of mathematical ideas with symbols, tables, diagrams, or other media to clarify the issue of mathematics and delivered with a mathematical language in teaching and learning mathematics, and can help teachers understand students' abilities in interpreting and expressing his understanding of mathematical concepts and processes they study. It can be concluded that the mathematical communication skills is the ability to disclosure of mathematical ideas with symbols, tables, diagrams, or other media to clarify the issue of mathematics and delivered with a mathematical language in teaching and learning mathematics, and can help teachers understand the students' ability to interpret and expressing his understanding of mathematical concepts and processes they study.

The reality found in the field, learning of mathematics for this still little attention to the development of mathematical communication skills, so that mastery of these competencies for students still low. For early test of mathematical communication skills of students, researchers give a written test about the shape of the story to the students, it can be seen in Fig. 1.

From the students' answers, it can be seen that students just answer the question directly, unfocused and difficult to understand. When asked to explain the student can not express how to get the answers, students only see the existing numbers and directly add up. From the students' answers can be concluded that young people have less mathematical communication skills in communicating the answer. The problem is in line with the problems found by Yuliani and Saragih [8], when the learning difficulties students to solve problems related to everyday life that require the use of mathematics and compile them into a mathematical model. This is because a given problem as long it does not contain non-routine matters, so do not make students perform activities of reflection, experimentation, inquiry, conjecture, and generalization. The difficulties encountered can be seen from how students think critically to solve problems given. The same thing also expressed by Saragih and Habeahan [9] that when students were exposed to matters that were not routine, for example, about the story related to solving problems related to everyday life, the value obtained by the student would usually be lower than with multiple choice questions.

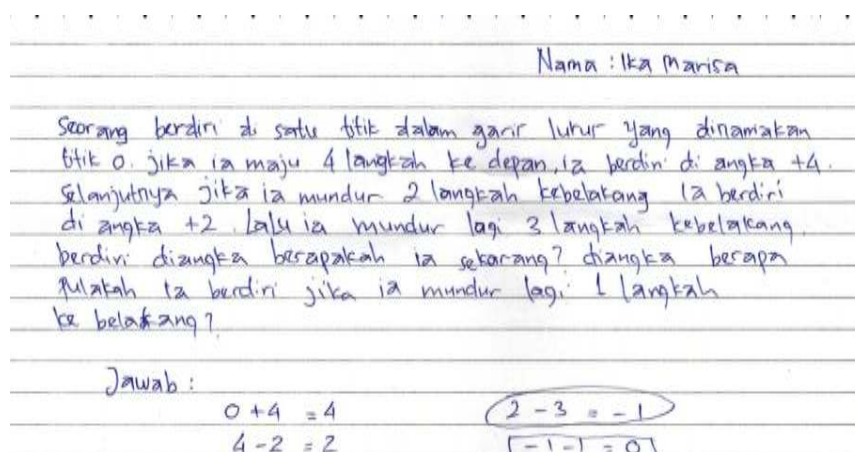


Fig. 1. Answer student

Mathematics communication can not be separated from the students' motivation in learning activities, Steers & Porter [10], which states *the term motivation was originally derived from the Latin word movere, the which means to move*. Motivation is a force in human beings, cause, direct and organize. Kurniawan [11,12] human social environment includes the surrounding physical environment, social relations and cultural environment that is defined as a group of people with a specific function and each berinteraksi. Sriyati, et al. [13] was extremely influential motivation on learning, motivation determines the level of success or failure of student activities, and motivation is one factor that determines the effective learning. Learning without motivation it is difficult to achieve optimal success. Motivation own behavior is influenced by several forces in the form of past experience, the level of intelligence, physical ability, the environmental situation, and life goals. From the results of the initial observations of researchers, researchers found students bored and unfocused because rooted in monotonous lessons in textbooks, and information retrieved level of motivation to learn math class VII MTs Yaspi Medan Labuhan Deli is still lacking. Kurniawan [11] Motivation to learn each student is not the same. The role of motivation that typically causes a person to have the desire and drive to do something. To further confirm the results of initial observation gives researchers studying motivation questionnaire to 10 students at random, can be seen from 10 students 6 of them have high levels of low motivation all. From the observation capability initial motivation is the need to be initiated a media use mathematics more favorable and

easy to understand students in order to create a love of students towards math. One way for pioneering learning that can motivate students is to use local culture based learning (Malay culture) and traditional. It is supported by opinion with the views expressed by Saragih and Napitupulu [14], that students were expected to use mathematics and mindset of mathematics in everyday life, and to learn about different types of science that emphasizes on logical arrangement and build student character and also the ability to apply mathematics. So hope would always be remembered and not drab. Usage-based learning Malay culture and traditional games of course will create a new atmosphere that is exciting and fun for the students so that they can motivate learning for students. Pacitan [15] The learning process takes place naturally in the form of student activities work and experience, not a transfer of knowledge from teacher to student. More important learning strategy that will achieve the desired result.

Based on some of the above problems and the results of the introduction observations of researchers to the class of VII MTs Yaspi Medan Labuhan Deli, it is necessary to dispose of mathematics pioneered the notion of the lessons students negative mathematics. Student need to have somethings that can change his thoughts of mathematics that is difficult to be fun, one of the suitable learning is learning-based *joyful learning* Malay cultural *context*. According to Singh [16] fun learning (*joyful learning*) is the kind of experience that can make students feel pleasure in teaching and learning. An appropriate learning environment to learn the

proper sequence is essential for learning, especially for children who are still in their infancy. According to Mulyasa [17] enjoyable learning is a learning process in which there is a strong cohesion between education and learners, without feeling forced or pressured (*not under pressure*). Education is the formation of national character has become a universal discourse during this time. Suparlan [18] that culture is the whole of human knowledge as a social being, which is used to interpret and understand the environment they face, and to create and promote behavior. In this competitive era learners are not only expected to have knowledge but also have the understanding of the values of knowledge, such as the planting of cultural elements in students because education and culture is a unity that can not be avoided from everyday life. This is in line with that proposed by Astri, et al. [19] that culture is a unified whole and complete, valid in a society and education is a fundamental requirement for every individual in society. Siagian [20] study habits outside school becomes very important. But the study habits is very dependent on the students themselves.

Of the background issues that have been raised, the researchers gave boundary problem as follows: (1) describe the profile of communication mathematics by joyful learning-based learning context Malay Culture in MTs Yaspi Labuhan Deli Medan; (2) To describe the profile of mathematics learning motivation with joyful learning context-based learning Malay culture in MTs Yaspi Medan Labuhan Deli; (3) Describe the profile of students' answers process with context-based learning joyful learning of Malay culture in MTs Yaspi Medan Labuhan Deli; (4) Research activities on material addition and subtraction of integers seventh grade in first semester; (5) Selection of subjects focusing on the class VII B MTs Yaspi Medan Labuhan.

The basic objective associate mathematics with the Malay culture is because the Malay culture has begun to disappear in the field, and communities wither in field dominant living in coastal areas of the field, while the Malay tribe was the first tribe in the field, but now has mendominan Batak tribe on the field and we only describe the mathematical communication and learning motivation of students with learning joyful Malay cultural context-based learning, by creating a context-based teaching materials LAS-based Malay culture and Malay cultural context.

Based on the problems found in research in the field, the problems were studied in this research was how to profile of mathematical communication skills and students' motivation by joyful learning context-based learning Malay culture.

2. METHODOLOGY

This research was conducted in MTs Yaspi Medan Labuhan Deli the first semester of the 2015/2016 academic year. This study used qualitative descriptive method, with three stages, namely the pre-court stage, the stage of field work and data analysis stage. Technique intake of the subjects in this study using purposive sampling technique. Before an election subject to significantly advance the researchers conducted Award test subject selection in class VII B MTs Yaspi Labuhan Deli Medan form 2 about the story to find out the mathematical communication skills early in the classical style, and giving motivation questionnaire study mathematics student before getting treatment learning joyful learning-based Malay cultural context to determine students' motivation to learn mathematics.

The test of selection subject was given to the students of class VII B totaling 50 students. Provision of this test was to determine the research subject, the student has a good skill level, sufficient or less. From the results of tests conducted, there were six students who have good ability, eight students have enough capability, and 36 who have less ability.

The measuring of instruments used in the form of tests students' mathematical communication skills that are useful to rank students. If one of the criteria was not met then the level of students descend on the lower level. The scoring rubric used mathematical communication skills are presented in Table 1.

In addition to communication skills math test when the choice of subjects, the researchers also analyzed the students' motivation by conducting interviews and giving questionnaires to the students of class VII B MTs YaspiLabuhan Deli Medan. The submission of motivation questionnaire to students learning math class VIIB totaling 50 student. The result of the questionnaire student there are five students have learned enough motivation, 37 students have high motivation to learn and 8 students have the motivation to learn is very high. In this

case turned out to be an average student has a high learning motivation but in reality many students are capable of mathematical communication is lacking, then in this case the researchers figure out what causes high learning motivation but mathematical communication skills of students dominant low.

From the test results of the selection of research subjects, then do the selection of the subject of each level mathematical communication skills, with the criteria of the problem as follows: (1) lack of mathematical communication ability students but has good motivation to learn (students in the group SKKMB); (2) sufficient mathematics communication ability students have less motivation to learn (students in the group SKCMK); and (3) communication ability students mathematics well but have less motivation to learn (students in the group SKBMK). In this case the researchers chose two students in each subject selection criteria based on the level of mathematical communication skills who has a problem to be more description of profile mathematical communication skills and students' motivation. With 2 subjects specified at each level of mathematical communication skills, the researchers more easily in analyzing the problem is actually happening on the subject by comparing and infer things that are considered the main problem is actually happening. Then the total subjects to be studied is 6 students with details of two students who have good communication skills with the motivation to learn

less, two students who have communication skills sufficient motivation to learn less, and 2 students who have communication skills lacking motivation to learn well.

In the course of research, there are several stages of data collection procedures were implemented as a flowchart in Fig. 2.

From flowcharts above can be seen that the data collection procedures were conducted: (1) search a subject by administering 2 of test communication skills;(2) The provision of learning motivation questionnaire to students; (3) Researchers provide context-based *learning joyful* learning the Malay culture to the subject; (4) Researchers offered an opportunity for subjects to complete the LAS; (5) The authors noted the students' activities during finish LAS; (6) Once a subject completed the LAS, researchers conducted interviews to uncover communication skills profile and motivation of students; [21] After the data collected, further checking of the validity of the data by triangulation sources that seeks to adapt the data sourced from the LAS, questionnaires and interviews conducted. If data LAS second and interviews LAS triangulation with the data sheet first, and the first interview showed the same, then the data is said to be both valid and reliable, otherwise if the data is invalid then given again LAS and subsequent interviews. Such a process is continued until the data were found valid.

Table 1. Rubric mathematical communications capabilities

Level	Criteria
3 (Full and true)	a. An explanation of the process of settlement problem written clearly and correctly. b. Change the sentence to the math problem correctly. c. Clear and correct calculation. d. The use of mathematical symbols or signs correctly.
2 (Partially true)	a. An explanation of the process of settlement problem written partly true. b. Mathematics sentence change to correct the problem. c. Calculation mistake. d. The use of symbols or signs math wrong.
1 (Information provided is not detailed and does not show the solution)	a. An explanation of the process is not properly and not appropriate solutions. b. Changeto sentence math problem not true c. The calculation is not correct. d. The use of symbols or signs math wrong.

From an assessment rubric writing communication skills can be said that students who have grades 3 has the ability to write good communication, value 2 has the ability to write enough communication, and one has the ability to write less communication

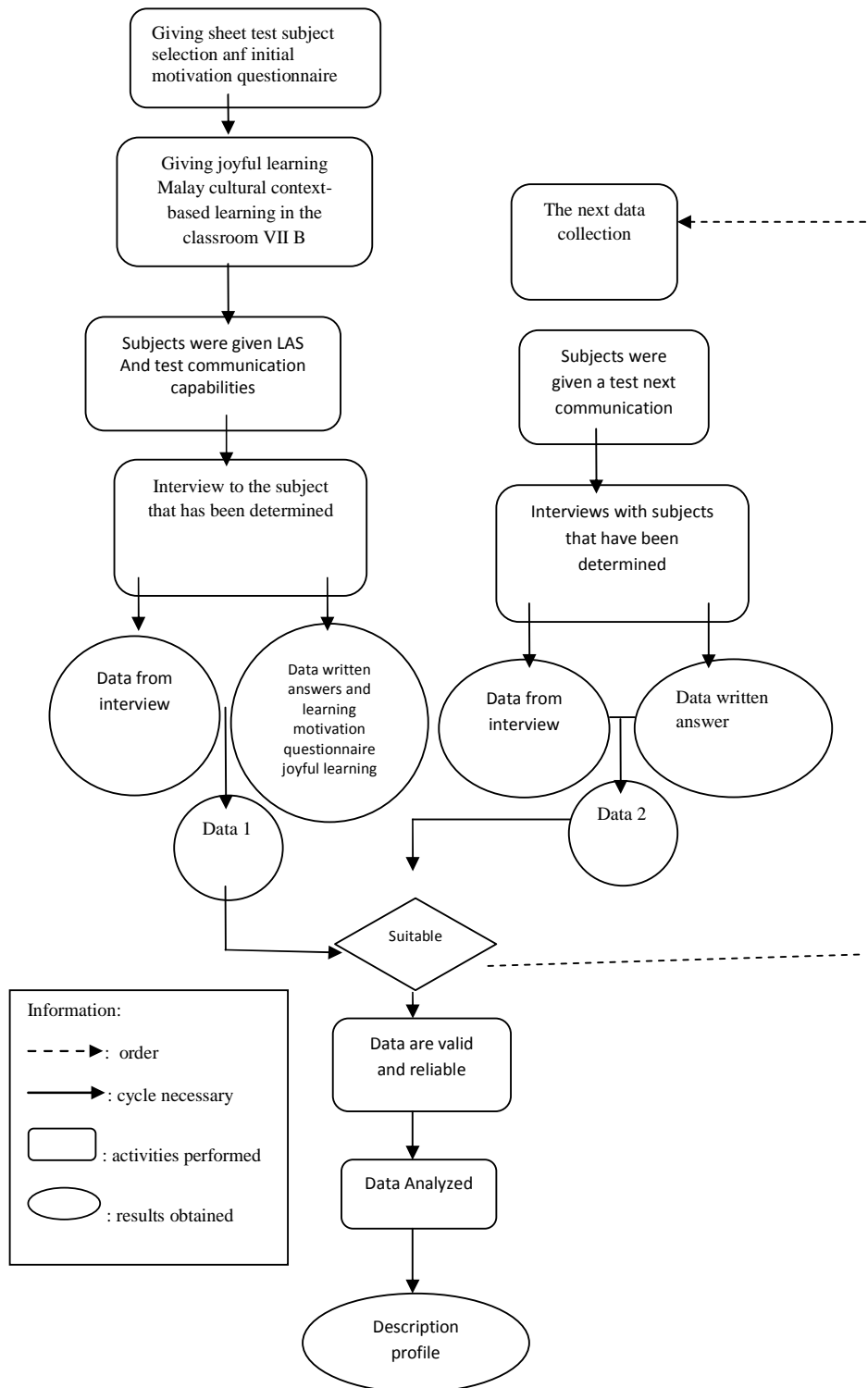


Fig. 2. Flowchart of the procedures of collection data

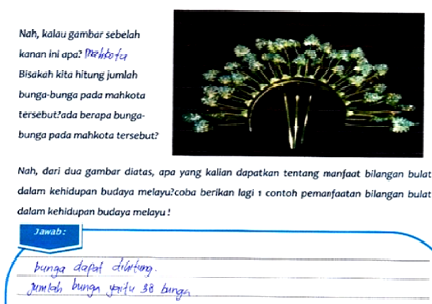
3. RESEARCH RESULTS

3.1 LAS Execution Process in Activity Based Learning Joyful Learning Malay Cultural Context

This activity started by giving LAS original activities of observation images, the initial activities, students were given a worksheet with orders students to make a number line from the image of the mosque Al-Mashun (Mosque Royal Malay Sultanate of Deli Medan) and given a reason to what they do. Here is one answer LAS at the beginning of activities:



(a) Answered SKBMK2 problem 1



(b) Answered SKBMK2 problem 2

Fig. 3.

One of the image can be seen that students on SKBMK2 group can create a number line in accordance with orders about, but have not been able to write an explanation in the form of words, and just cross out (make the line) to the image in question. In this case the subject is able to change the wording in the form of images, but it can not explain the figures in the form of words. The figures show that the subject can communicate mathematics but not yet fully meet the needs of indicators set. Fig. 3b student on SKBMK2 group replied that the interest in the crown that is used for the bride during a wedding can be calculated that 38 flowers. In the second

question on this subject can perform calculations on the crown, but can not write an example of the benefits of integers with the culture because of his knowledge of Malay culture just a little.

After giving the LAS at the beginning of the activities, students are formed into 10 groups with each group of 5 people with the name of the group was given the names of the royal sultan Maimun. Each of student given LAS 1 related to the learning to find the concept of integers (with the concept of negative numbers left zero, and positive numbers to the right of zero), the LAS 1 given instructions and examples for concept as seen in Fig. 4.

LAS 1 was done group with pay attention Malay dance video, each group watched a video answering the questions on the LAS 1 and follow the instructions and examples given.

In workmanship LAS 1 students were very happy and excited because they can learn to find the concept itself and the way that they have never felt before, there were a wide variety of answers to the name of the dance moves they make themselves and in the process of completion of the overall students understand and know to find a concept layout integers with dance moves that they noticed on video that they observe. After LAS 1 finished the continued provision of LAS 2 with the purpose of application of the sum of the integers, the students were asked to make the dance moves and write captions meaning of the movement they have made.

In workmanship LAS 2 students created dance move in groups and students were happy because it was released to make the dance movements any to answer questions summation, after dancing free student charge sheet LAS answered questions some about the story, by the command of students answered in a straightforward manner answered by mathematical calculation and the calculation of the dance moves, all the groups were able to finish LAS 2 well, conducted learning activities in accordance with the instructions and orders were given. Example of the students' answer to $2 + (-4)$ is "first do two steps to the right cross, as in the added negative then do another 2-step cross to the left means that the zero position, and 2-step cross to the left again in the position of -2. Then the answer is -2a €. Students were very enthusiastic and happy to resolve this LAS, students who had been passive to active and can expose your imagination. When finished completing LAS 2 LAS, the students were given 3 which is play ball bekel mathematics.

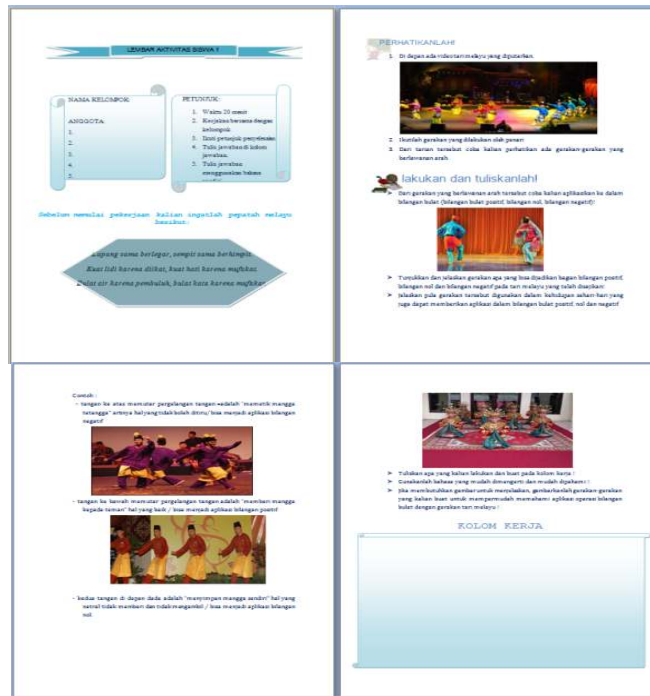


Fig. 4. Student activity sheet 1



(a) Students by flocking viewing video traditional malay dance



(b) Students individually writing dance movement for the concept of integer positive, negative and zero

Fig. 5.



(a) Students by flocking making dance movement



(b) Students completing discussion LAS 2

Fig. 6.

The Ordinary of mathematics learning faced by students, was never done learning to apply the traditional game only focuses on solving problems with formulas so that students tend to be tense and bored. This activity is playing ball bekel mathematics is useful to strengthen the concept of addition, students who already know the game was very enthusiastic and spirit of both men and women they were playing, there was joy when the game progresses students often laughing because it must make rhyme or proverb Malay so there was the impression of their joy in learning mathematics.

For material reduction activities integers given LAS4 students who worked groups.LAS was given to know the students' communication skills in problem solving subtraction of integers using a bottle cap numbers. In the LAS provided examples and how to do subtraction by using a bottle cap numbers, every individual students in the group are given the opportunity to understand one's own example problems and then explain to the group's friends alternately or work together.

In this activity, the student in the research in the field notes enthusiasm, passion and pleasure for each student in doing LAS participate actively in

problem solving. Once students have completed the LAS group, were given the opportunity to present in front of the group, and other groups were welcome to comment on if something goes wrong answers steps to resolve the group presentation. After the LAS subtraction of integers students were invited to play with the group with the game traditional game commonly played by children of the Malays, in this game the students to groups in advance to prepare questions that will be given to the opponent. The game took a fun and a new experience for the students.

The results of the analysis of the learning process in the form of joyful learning Malay cultural context-based learning students were more active in asking and have a higher level of thinking so that they were able to communicate through writing and especially orally. Based on the analysis and in-depth interviews LAS answer to the sixth subject, the overall student felt happy and pleased with joyful learning device context-based learning Malay culture. Students become more familiar with the Malay culture which is the local culture in MTs Yaspi Medan Labuhan Deli, and students become more able to associate the environment, history, traditional games, customs and habits of the Malay community in the



(a) Students' discuss understanding command LAS3 before play ball jacks mathematics



(b) Students' flocking play ball In jacks mathematics

Fig. 7.



(a) Students' writing results Pengurangan With numbers Tubo



(b) Students' performing calculations with Tubo numbers

Fig. 8.

learning of mathematics. So it concluded that the components of the device were made based learning joyful learning context-based learning Malay culture contribute positively to students' mathematics learning activities.

3.2 The Process of profil Math Communication Skills Answers with Joyful Learning Malay Cultural Context-Based Learning

To know the mathematical communication skills subjects after a given learning joyful learning based on context of the Malay culture, the researchers gave four of test communication skills math to sixth subjects to determine the answers to test mathematical communication skills, the way of four questions put on the table that is different and the subject should read the poem Malay or Malay proverb before heading for each table matter, so the subject should be prepared 4 rhyme or Malay proverb before testing mathematical communication skills. Here are answers to some subjects in completing the test the ability of communication with joyful learning context-based learning Malay culture:

3.2.1 Items number 1

In Malay culture, we know that the Malay community would appreciate and honor those who are around him. Seen as Jamaah Masjid Al-Osmani (Malay oldest mosque in Medan) still want to queue up when they want ablution that at that time there was only one scoop at a mosque pond. In the queue there were eleven people in front behind, eleven people behind the front, and 10 people in the middle. There is what is the number of people who lined up to perform ablution?

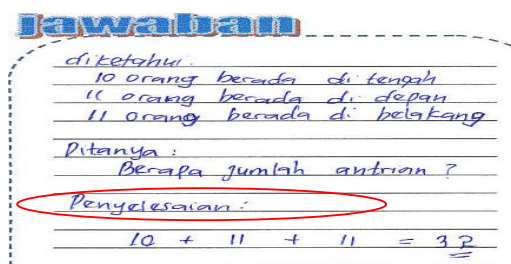


Fig. 9. Answer item problem No. 1SKBMK2

In answering to the Question item1students on group SKBMK2 able to write an explanation of the problem solving process is written clearly and correctly, can turn a problem into a correct sentence, but do the calculations wrong.

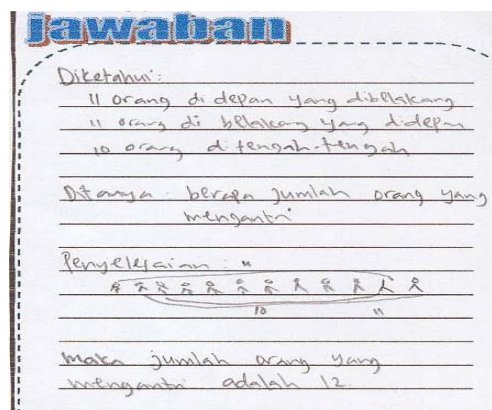


Fig. 10. Grain answer problem no. 1 SKCMK1

In answering to the Question item 1students on group SKCMK1 able to write an explanation of the problem solving process is written clearly and correctly, can turn a problem into a correct sentence and can perform calculations clearly and correctly.

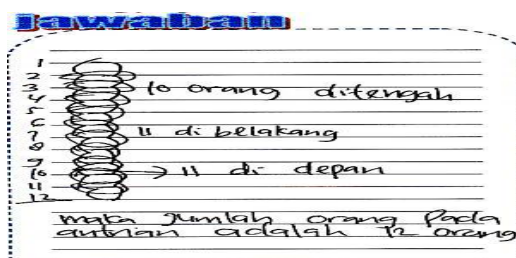


Fig. 11. Answer item problem no. 1 SKKMB2

In answering to the Question item1students on group SKKMB2 able to write an explanation of the problem solving process was written clearly and correctly, can turn a problem into a correct sentence and can perform calculations clearly and correctly.

3.2.2 Items number 2

Mr. Usman was the palace pool attendant who was in front of Masjid Al-Mashun (Royal Malay Mosque in Medan Maimun). The pool contained 340 tail catfish, because there's birthday party princess then taken 40 fish. A chef's palace took 45 heads again as guests who would come more. Because many fish taken that day make the fish living in the pond died of stress and 18 tails, then pack Usman came carrying as many as 68 seeds catfish tail and inserted directly into the pool. What is the rest of the fish in the pond? (finish with the addition operation integer).

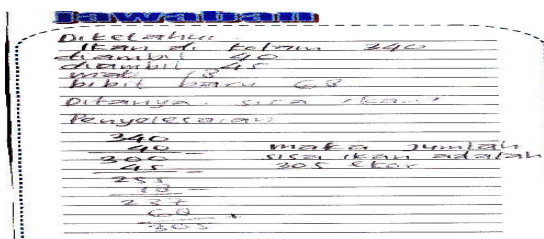


Fig. 12. Answer item problem no. 2 SKBMK1

In answering to the Question item 2 students on group SKBMK1 able to explain the process of problems solving written clearly and correctly, is able to change the sentence do the math problem correctly, and perform calculations clearly and correctly.

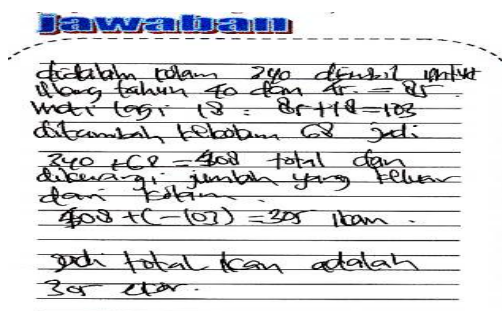


Fig. 13. Answer item problem no. 2 SKCMK2

In answering to the Question item 2 students on group SKCMK2 able to explain the process of problems solving written clearly and correctly, is able to change the sentence to the math problem correctly, and perform calculations clearly and correctly.

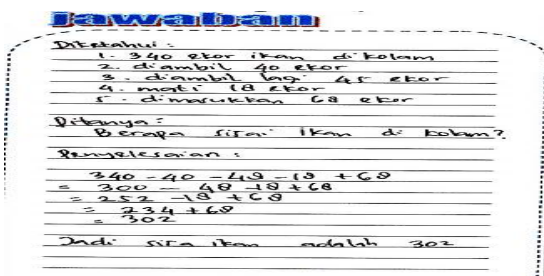


Fig. 14. Answer item problem no. 2 SKKMB1

In answering to the Question item 2 students on group SKKMB1 not been able to explain about the problem solving process are written clearly and correctly, is able to change the sentence to the math problem correctly, and perform calculations was not correct.

3.2.3 Item question 3

Malay synonymous with the religion of Islam, the Imam of Masjid Al-Osmani who was in Labuhan have a house 80 meters from the Masjid Al-Osmani. When the clock has been demonstrated at 12 o'clock, Mr. Imam walked towards the mosque, while when it has run as far 45 meters, Mr. Imam remembered that there is a paper announcement indigenous stakeholders to be broadcast after the midday prayers. After turning your back home from 25 meters, he met with his son who brought the paper the announcement. Mr. Imam immediately went on a trip back to the Masjid Al-Osmani. How far is the distance from Mr. Imam of Masjid Al-Osmani on that day? (Finish with the addition operation integer).

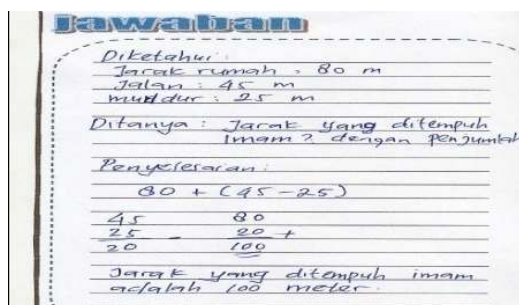


Fig. 15. Answer item problem no. 3 SKBMK2

In answering to the the Question item 3 students on group SKBMK1 able to explain the process of problems solving written clearly and correctly, is able to change the sentence to the math problem correctly, and perform calculations clearly and correctly.

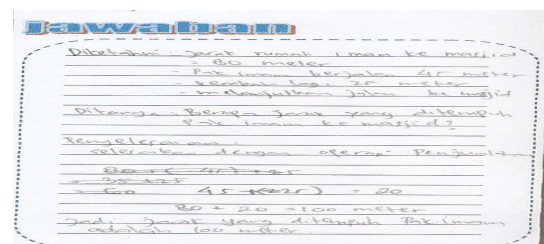


Fig. 16. Answer item problem no. 3 SKKMK1

In answering to the Question item 3 students on group SKKMK1 able to explain the process of solving problems written clearly and correctly, is able to change the sentence to the math problem correctly, and perform calculations clearly and correctly.

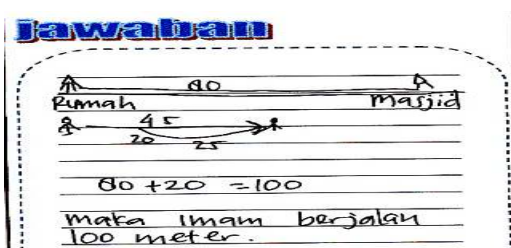


Fig. 17. Answer item problem no. 3 SKKMB2

In answering to the Question item 3 students on group SKKMB1 able to explain the process of solving problems written clearly and correctly, is able to change the sentence to the math problem correctly, and perform calculations clearly and correctly.

3.2.4 Items number 4

Sultan Osman wanted to see the castle from a distance by climbing the tower, first sultan Osman climbed the tower at a height of 5 meters, according to the new palace guard tower will be visible at a height of 12 meters. Try to determine how many meters must again that the position of sultan Osman can see the Palace? the sum of the integers? (Finish with the addition operation integer).



Fig. 18. Answer item problem no. 4 SKBKM1

In answering to the Question item 4 students on group SKBKM1 able to write an explanation of the problem solving process is written clearly and correctly, can turn a problem into a correct sentence and can perform calculations clearly and correctly.

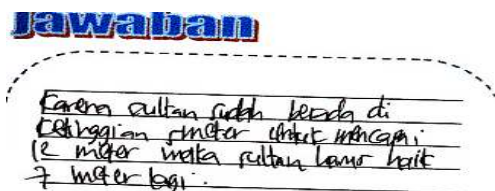


Fig. 19. Answer item problem no. 4 SKCMK2

In answering to the Question item 4 students on group SKCMK2 able to write an explanation of the problem solving process that was written with the less obvious and true, are less able to change the sentence to correct the problem and can perform calculations clearly and correctly.

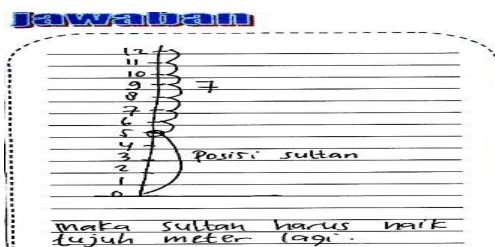


Fig. 20. Answer item problem no. 4 SKKMB2

In answering to the Question item 4 students on group SKKMB2 able to write an explanation of the problem solving process is written clearly and correctly, are less able to change the sentence to correct the problem and can perform calculations clearly and correctly.

From the analysis of the test answer mathematical communication skills and the results of interviews with the sixth subject can be concluded that in the resolution of problems, there were positive changes in student in the group SKKMB, during the learning activities were more active and communicative, as well as in solving ability test. From the analysis of the test answer mathematical communication skills and the results of interviews with the sixth subject can be concluded that in the resolution of problems, there were positive changes SKKMB, during the learning activities were more active and communicative, as well as in solving ability test communication student in the group SKKMB able to communicate answers in written form by far better than before getting the context-based learning joyful learning the Malay culture and learning motivation is getting better. For students in the group SKCMK there is also a positive change and become more active and imaginative in the process of teaching and learning, in completing the test the ability of communication student in the group SKCMK able to write down the answers well and seen that his communication skills are good progress and learning motivation to be very good, students in the group SKBKM that indeed does have communication skills both getting better with this learning, and in doing tests communication skills able to finish with a good and varied, the most visible is learning motivation very positive

change to be very good because they are happy with this learning. Generally most students have been able to explain workmanship problems with communicating mathematical problems into written form, which is shown by the answer to that is in conformity with the indicators of mathematical communication skills by writing the completion of the answers clearly and correctly, change issues into sentences math is right, doing calculations clear and correct, and using math symbols or signs as appropriate. This is because the process of implementation of the test by using a mathematical communication skills learning *joyful learning* context-based Malay culture, which requires students to think more exploratory than just thinking of mechanical and procedural. Problems are given a problem that is often experienced by the subject so that the ideas and imagination can be explored in communicating mathematics.

3.3 The Profile of Motivation Math Students with Learning Joyful Learning Based on the context of Malay Culture

From the results of students' learning motivation questionnaire after receiving study treatment *joyful learning* based on context of Malay culture. Traditionally there are 47 students have motivation to learn good and 3 students have the motivation supfigureient. In this analysis remains focused on six subjects who have been from the beginning. 6 this subject in filling out the questionnaire found that they all had a good learning motivation with learning *joyful learning* based on context of Malay culture.

From the analysis of the profile of motivation to learn math and depth interviews with six subjects can be concluded that the motivation to learn mathematics high student hampered because it always get learning monotonous, which focuses on LKS purchased students` so the subject is less capable of imagining and ideas of mathematics in everyday life -day. After getting treatment learning *joyful learning* context-based Malay culture, there were positive changes in motivation to learn mathematics, because these are new learning and fun for them. These lessons can also enable students to discover the concept of addition and subtraction of integers independently, but it also can make the subject more familiar with the Malay culture and Malay traditional games can apply to the study of mathematics.

4. RESULTS OF DISCUSSION

From the research results obtained showed that the learning process joyful learning Malaycultural context based on the whole student felt happy and pleased with joyful learning device context-based learning Malay culture. Students become more familiar with the Malay culture which is the local culture in MTs Yaspi Medan Labuhan Deli, and students become more able to associate the environment, history, traditional games, customs and habits of the Malay community in the learning of mathematics. So it concluded that the components of the device were made based learning joyful learning context-based learning Malay culture positive contribution to mathematics learning activities students. Constitute natural thing if there were positive changes in students' mathematical communication skills by learning *joyful learning* based on context of Malay culture. This was because the students independently invented the concept of matter and mastered since the students do their own things to strengthen the concept of the material to the students, so that students easily remember the concept that they can, while the role of the teacher is to guide students to give direction (*guided*) and students were encouraged to think for themselves so that they can find common principles in the directives / questions given by the teacher and the extent to which students are guided depends on its ability and the material being studied.

Thus it is known that learning *joyful learning* context-based Malay culture encourages students to enjoy the learning process so that they can analyze their own problems given the atmosphere is fun so it can find the general principles based on materials or data that has been provided by the teacher and the concept that can be more inherent in because the students' memories with a fun learning can make students focus high. The results of the research that is research-based learning culture by Sasono [22] is based on the analysis of the cycle I, II and III which consists of 4 LKS. The results of student learning using the learning device in the form of LKS is oriented to the local culture has increased. In this case the cultural-based learning can improve students skill. So that process can be concluded that the provision of learning *joyful learning* based Malay cultural context can

provide positive thing with more students have the communication skills prior to learning mathematics of *joyful learning* is based on the cultural context and the students are more skilled in communicating mathematics in the process answer.

The process of students' answers to be based on indicators of students' mathematical communication skills. From the analysis of the answers is done, the process of obtaining the answers to the subject assessment criteria is the best. The process of the students' answers on tests of mathematical communication skills more structured, systematic, varied, and in accordance with the indicators of communication capabilities when compared to the test subject selection. This is because the learning process by learning *joyful learning* context-based Malay culture, students are required to think more exploratory than just thinking of mechanical and procedural. In addition, students are trained to communicate mathematical problems often experienced by students in the form of the Malay culture, by providing a common problem experienced by students, then the mindset students not just limited to textbooks, so students were able to explain the process of problem solving written clearly and correctly, students also be able to change to sentence math problems correctly and the students were able to perform calculations correctly, they can solve the problems in their own way and the measures they consider appropriate settlement. So that it impacts on the results of the test students' mathematical communication skills, where most of the students' answers systematic, structured, varied, and according to indicators of students' mathematical communication skills. Unlike the usual learning, students are only required to answer the questions correctly as exemplified teachers.

This is in line with the results of research conducted by Nyoman [12] in his study of local culture-based learning that was based on the results of research and discussion, guided inquiry-based learning local culture effectively improve students' higher-order thinking skills. Teachers can apply learning based learning local culture as an alternative to improve students' higher-order thinking skills. It concluded that the answer to students who obtain teaching to learning *joyful learning* context-based Malay culture better at solving problems of mathematical communication skills.

Likewise with the students' motivation profiles by joyful learning Malay cultural context-based learning there was a positive changing in the motivation to learn mathematics, because these are new learning and fun for them. These lessons can also enable students to discover the concept of addition and subtraction of integers independently, but it also can make the subject more familiar with the Malay culture and Malay traditional games can apply to learning mathematics theoretical. John Keller [23] suggests that the learning procedure motivation in learning, there are four attributes of learning into consideration the design of learning strategies. The four models are *Attention*, *Relevance*, *Confidence*, and *Satisfaction*. *Attention*, are the students' attention will appear driven curiosity, *Relevance*, relevance between what is learned to the needs of students, *Confidence*, is confidence in the form of hope for success, and *Satisfaction*, is the satisfaction of success in achieving the goals which will continue to spur students to learn. In learning *joyful learning* context-based Malay culture is the thought process is usually done through a question and answer between teachers and students is done in writing or orally while maintaining a pleasant atmosphere, in the form of guide sequences of questions to help students find answers to issues questionable. Students in this case demanded more explorative and more creative thinking rather than thinking of mechanical and procedural. Teachers only act as a facilitator to set the course of learning. Such learning process had a positive impact on the development of students' critical thinking and help students develop intellectual discipline and skill needs to arouse curiosity and seeking answers from curiosity, so that students have the confidence and satisfied with their work. It can be concluded that the learning *joyful learning* context-based Malay culture can provide more motivation to the students because it is a joyful learning and favored students so there were positive changes motivation to learn than before given learning *joyful learning* based on context of the Malay culture and after given learning *joyful learning* -based context Malay culture.

5. CONCLUSION

Based on the analysis and discussion in this study, presented some conclusions as follows: (1) Learning *joyful learning* context-based Malay culture can help students find math concept independently with the atmosphere they love,

can make them more active in asking and have the ability to think more imaginative and varied in solving mathematical problems that make them better able to communicate better mathematics; (2) the students' answers on tests of mathematical communication skills after learning *joyful learning* context-based Malay culture experienced a positive changing and the students' answers further demonstrate communication skills in solving mathematical problems given, subject more to explain about the problem solving process is written correctly and obviously, can turn a problem into a true mathematical sentence, and perform calculations more careful to produce a clear and correct calculations; (3) Learning *joyful learning* context-based Malay culture there were positive changing in motivation studied mathematics, because this learning is new and fun, this learning can also enable students to discover the concept of addition and subtraction of integers independently, but it also can make subject more familiar with the Malay culture and Malay traditional games can apply to the study of mathematics.

6. RECOMMENDATION

By learning math become subjects of the most feared and monotonous students should be positive changing that can make students love to learn math by providing the material in a fun way. The results of this research is a clear example that the lifting of mathematics learning with joyful learning Malay cultural context-based learning can provide positive changing to the students, good communication skills and motivation to learn mathematics, as well as increasing the students' knowledge about the Malay culture. Proved that by utilizing the local culture in teaching and learning mathematics both in conducting discovery concept, as well as mathematical problem solving can improve the ability of higher mathematics forward- thinking.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Fakhruddin Z, Meerah TSM. Kebersanan modul pembelajaran dengan penggunaan pendekatan konseptual enteraktif berbasis peralatan budaya tradisional untuk mengurangi miskonsepsi pelajar. In Proceeding 7th International Seminar on Regional Education. 2016;2:725-736.
2. Septiani MD, Sukestiyarno S, Suyitno A. Pembentukan karakter dan komunikasi matematika melalui model problem posing berbantuan scaffolding materi segitiga. Kreano, Jurnal Matematika Kreatif-Inovatif. 2014;4(1):41-49.
3. Putrawan AA, Suharta IGP, Si M. Pengembangan perangkat pembelajaran matematika dengan pendekatan scientific berbantuan geogebra dalam upaya meningkatkan keterampilan komunikasi dan aktivitas belajar matematika siswa kelas VIII SMP. Jurnal Pendidikan Matematika. 2014;3:1.
4. Saragih S. Pengaruh pendekatan pembelajaran dan Locus of control terhadap kemampuan penalaran matematika siswa. Jurnal Kependidikan (Online). 2011;41:2.
5. Rahmawati A. Peningkatan kemampuan komunikasi dan pemecahan masalah matematika melalui strategi think talk write (PTK pada Siswa Kelas VIII G Semester Ganjil SMP Negeri 1 Juwiring Tahun 2015/2016) (Doctoral dissertation, UNIVERSITAS MUHAMMADIYAH SURAKARTA); 2016.
6. Saragih S, Rahmiyana. Peningkatan Kemampuan Komunikasi Matematis Siswa Sma/Ma Di Kecamatan Simpang Ulim Melalui Model Pembelajaran Kooperatif Tipe STAD. Jurnal Pendidikan dan Kebudayaan (Online). 2013;19:2.
7. Guerreiro A, Serrazina L. Communication as social interaction primary school teacher practices. In Atas da Sixth Conference of European Research in Mathematics Education; 2009.
8. Yuliani K, Saragih S. The development of learning devices based guided discovery model to improve understanding concept and critical thinking mathematically ability of student at Islamic Junior Hight School of Medan. Journal of education and Practice (Online). 2015;6:24.
9. Saragih S, Habeahan WL. The improving of problem solving ability and students' creativity mathematical by using problem based learning in SMP Negeri 2 Siantar. Journal of Education and Practice (Online). 2014;5:35.
10. Steers RM, Porter LW. Work and motivation: Some concluding observations. Motivation and Work Behavior. 1991;5:73-582.

11. Kurniawan R. Pengaruh Lingkungan Sekolah, Motivasi Belajar dan Fasilitas Belajar Terhadap Hasil Belajar Siswa Pada Mata Pelajaran Peralatan Kantor Kelas X Administrasi Perkantoran SMK Negeri 1 Kudus Tahun Pelajaran 2012/2013. *Economic Education Analysis Journal*. 2014;2:3.
12. Nyoman S. Pembelajaran Inkuiri Terbimbing Berbasis Budaya Lokal Untuk Meningkatkan Keterampilan Berpikir Kritis Siswa SMA Negeri 4 Singaraja. *Seminar Nasional Riset Inovatif I Bali*; 2013.
13. Sriyati LM, Dantes N, Candiasa IM, Kom MI. Pengaruh model Pembelajaran Kooperatif Tipe STAD Terhadap Prestasi Belajar Matematika Ditinjau Dari Motivasi Belajar Siswa Kelas XII IPA SMA Negeri 2 Semarang. *Jurnal Penelitian dan Evaluasi Pendidikan*. 2014;4.
14. Saragih S, Napitupulu E. Developing student-centered learning model to improve high order mathematical thinking ability. *International Education Studies*. 2015;8(6):104.
15. Pacitan MSN. Efektifitas Pembelajaran Berbasis Joyfull Learning Dalam Meningkatkan Kompetensi Dasar-Dasar Desain Pada Siswa Kelas X Paket Keahlian DKV SMK Negeri Pacitan. *Jurnal Inspirasi Pendidikan*. 2016;6:1.
16. Singh Seema. Creating a joyful learning environment at primary level. *International Journal of Education*. 2014;4:1.
17. Mulyasa E. Menjadi Guru Professional Menciptakan Pembelajaran Kreatif dan Menyenangkan. Bandung: Remaja Rosdakarya; 2005.
18. Suparlan P. Kebudayaan, Masyarakat, dan Agama: Agama Sebagai Sasaran Penelitian Antropologi *Majalah Ilmu-ilmu Sastra Indonesia (Indonesian Journal of Cultural Studies)* Juni Jilid X Nomor 1. Jakarta: Fakultas Sastra Universitas Indonesia; 1981.
19. Astri W, Aji A, Tias W, Budiman S. Peran Etnomatematika dalam Membangun Karakter Bangsa. *Prosiding Seminar Nasional Matematika dan Pendidikan Matematika. Jurusan Pendidikan Matematika FMIPA UNY*; 2013.
20. Siagian REF. Pengaruh Minat dan Kebiasaan Belajar Siswa Terhadap Prestasi Belajar Matematika. *Jurnal Formatif*. 2015;2:2.
21. Kurniawan D, Wustqa DU. Pengaruh Perhatian Orangtua, Motivasi Belajar, dan Lingkungan Sosial Terhadap Prestasi Belajar Matematika Siswa SMP. *Jurnal Riset Pendidikan Matematika*. 2014;1(2): 176-187.
22. Sasono M. Pengembangan Strategi Pembelajaran Sains Terpadu Berbasis Budaya Lokal Untuk Meningkatkan Keterampilan Proses Siswa Di SMP Negeri 3 Melati. *Jurnal Pendidikan MIPA*. 2010;2:1.
23. Keller J. Using the ARCS motivational process in computer-based instruction and distance education. *New Directions for Teaching and Learning*; 1999.

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