Communication in Mathematics Contextual

C. Indah Nartani, Rosidah Aliim Hidayat, Yohana Sumiyati

Abstract – Research purposes, generally determine the application of contextual learning of mathematics in elementary school. It is specifically intended to determine the ability of mathematical communications in contextual learning in mathematics. For this 2nd-year research approach, this study uses overall research and development with qualitative research design. While the Informants are classroom teachers and students at Taman Muda Yogyakarta Elementary School. Data are collected through observation, interview, and documentation. Data were analyzed using qualitative analysis i.e flow method. The validation of the data is obtained using triangulation techniques and resources. The result of the study show that: contextual learning can improve student's mathematical communication. Thus contextual-based mathematics instruction has the potential to be practically applied. The pre-action mathematical communication skills of students in Taman Muda Yogyakarta Elementary School i.e 31.67%, while after the action by applying a contextual-based mathematics instruction, mathematical communication skills of students increased by 33.33%, to 65% or has exceeded expectations attainment mathematical communication skills in Taman Muda Yogyakarta Elementary School. The increased communication skills in Taman Muda Yogyakarta Elementary School is marked by the achievement indicators of success in improving the communication skills of mathematics indicated by, (1) Students are able to express ideas with verbal mathematics sentence, (2) Students are actively involved in discussions about math, (3) Students can formulate definitions and generalizations about the math, (4) students can formulate a definition of mathematics using his own words.

Keywords – Communication, Contextual, Learning, Mathematics.

I. INTRODUCTION

The ability of mathematics communication is very important for students. Growing about mathematics language's students then it is better to do argumentation. The ability of argumentation surely giving opportunity for students to understand various of mathematics concepts. The comprehension of good concepts or principle and be smart to do calculation will give good impact for mathematics learning outcomes students. (NCTM: 2000). That declaration is showing that the ability of students mathematics communication is the main process to improve the ability from students mathematical thinking. The reality in the field shows that limitedness of teacher knowledge and the habit of learning students in the class to be done with conventional ways and this thing can not improve the ability of students mathematics communication optimally. Another case, if mathematics materials are presented by teachers who have abstract characteristic and teachers do not involve students in mathematics learning.Beside that, as long as learning that

to be done by teachers still sticked in steps for serve mathematics learning. There is part of presentation in that learning ; (1) First, teach about theory, (2) Give the example of questions, (3) do exercise.

Representation in mathematical communication can help the process of perfecting the understanding of mathematical ideas, and help build meaning and permanence of an idea. When students are challenged to think and reason about mathematics and communicate their ideas orally and in writing, then with the help of representation can gain an increasingly clear understanding and surely.The achievement can help students in explaining mathematical concepts or ideas, and facilitate the child get strategies (NCTM, 1989).

Math students communication skills can be developed through the application of contextual learning, contextual learning because students are involved in directly to find its own concept, the idea, the real picture with their own Mathematical sentences for contextual learning is more focused on the relationship between the material being studied students with practical usefulness in life daily. Find is important in the learning process, because with finding a solution to the problem itself, students have their own satisfaction and not easily forget. This thing is in accordance with the opinion of Suherman (2012: 11-54), that the finding, the ability to think independently will be trained and become accustomed , In addition, contextual learning of mathematics will emphasize boredom current students learn math concepts and increase student interest in learning.

According to Johnson (2014: 14), contextual learning (Contextual Teaching and Learning) is a learning system that is based on the philosophy that students are able to absorb the lessons if they grasp the meaning of the academic material they receive, and they capture the meaning in school assignments if they can relate new information with knowledge and experience they already have before. By involving seven components, including: (1) constructivism, (2) ask, (3) finding, (4) the community study, (5) modeling, (6) reflection, and (7) apply contextual learning assessment in fact.This is expected to make students more active in arguing and easier to understand mathematical concepts.

In any study of mathematics teachers should direct the learning activities, and encourage students to learn more actively both individually and in groups, so that students can determine or build their own knowledge. These things make learning scenario that starts from real life contexts of students. Furthermore, teachers facilitate students to lift an object from real life into mathematical concepts with questions and answers, discussion and inquiry. According to Johnson (2009: 15), contextual strategies allow active students to teach their selves with real experience, not memorization. So students have the opportunity to express mathematical ideas invented by these students. According

with Sanjaya's opinion (2006: 109), which suggests that the knowledge and skills students gained in managing students construct their own knowledge and new skills, while students learn.

In mathematics education, the ability to communicate is one of the skills students should possess. He said (in Yani Ramdani: 2012) says that when a students obtain information in the form of a mathematical concept that the teacher or obtained from reading, then when it happens transformation mathematical information from the source to the poor students. Students respond based on his interpretation of the information, resulting in further mathematical. More communication process, Turmudi (2009: 1-15) said that the situation is imaginary or real students gained from the experience, making the learning of mathematics as an activity that is useful and meaningful which emphasizes reasoning instead of mathematical formulas.

Based on such matters would deserve held renewal, innovation in teaching mathematics. Learning should be varied so that the ability of students can be optimized, especially in terms of communication mathematical. For this study raised the topic of communications in contextual learning in mathematics elementary.

II. RESEARCH METHODS

This study overall use of research and development. 2years study using qualitative research design. Location research Elementary School Young Park City of Yogyakarta. The resources of the data include informants, documents, and place or the reality of the informants, the class teacher and elementary school students Young Park City of Yogyakarta.The method of data collection, namely observation, interviews, and analysis of data using documentation analysis. The steps of qualitative methods. Valid data using triangulation techniques and resources.

III. RESULTS AND DISCUSSION

Contextual learning mathematics can provide a great opportunity for students to be directly involved in learning and build their own knowledge.According learning theory of constructivism, Vygotsky (Ali, 2006: 39) states that students must build their knowledge in the minds of their selves. Every knowledge or ability only can be obtained or controlled by a person if that person is actively construct knowledge or ability in mind.

At the time of students's mathematics learning process less attention and focus group discussions did not go well. This happens because when the delivery of material math, the teacher has not been much involved students, in addition, learning model used learning conventional models . Based from the facts that obtained from the initial observation and observation, mathematical communication skills are still fairly low. Communication skills mathematics only reached 31.67%. This means that the achievement was far from expectations, namely 60%. This is in accordance with Rohaeti and Wihatma (Annisa: 2014) argues that the average communication skills are at

less qualified, particularly in communicating mathematical ideas. This because the students rarely provide feedback on the learning process that has been going on. Good communication skills in mathematics, at least the students could express what they were thinking about mathematics learning which takes place in the form of oral and written.

To assist students in improving the communication skills of mathematics, the step taken is to apply mathematics-based contextual research. According, Surianta (2013: 9-10) stated that there is a difference in learning achievement among students who follow the media-assisted contextual learning ICT and conventional students. The powers of the following study is due to the difference in treatment which to be given. The effectiveness of contextual learning in mathematics learning can not be separated from the substance of the subject matter ofmathematics.Teachers conduct teaching and learning process in accordance with contextual learning scenario that has been made. Moh. Sholeh (2007: 129-137) said that planning is the main function of which affect subsequent functions, so that a teacher should be able to prepare a written plan.

The contextual learning scenario that has been made implementing aspects: 1) the teachers deliver the material to be learned and guide students to associate learning materials with everyday life, 2) encourage students to ask if there is material that has not been understood and gave the students questions to cultivate curiosity of students, 3) gives students the opportunity to find their own answers to the problems facing mathematics, 4) the teacher shows a model or an example in order to provide an understanding for students, 5) doing math problems related to everyday life in a group that interactions arise in the classroom, 6) students in group discussions to solve mathematical problems encountered, 7) provides the opportunity for students to present the results of discussions, 8) teachers when assessing the learning process takes place and at the end of learning as an actual assessment , 9) students reiterated what he has learned, 10) students can convey the message and impression about the teaching and learning process, 11) teachers can give assignments or home works related to real life.

Contextual learning mathematics in Taman Muda Yogyakarta elementary school, the students held a group discussion and learning about the subject matter. The results showed that by using a model of group learning can enhance classroom interaction and communication experience enhancement. Mathematics matters is consistent with the results of research Salah Haji (2012) which stated that the communication skills of students who are taught mathematics through contextual learning better than students taught through conventional learning.
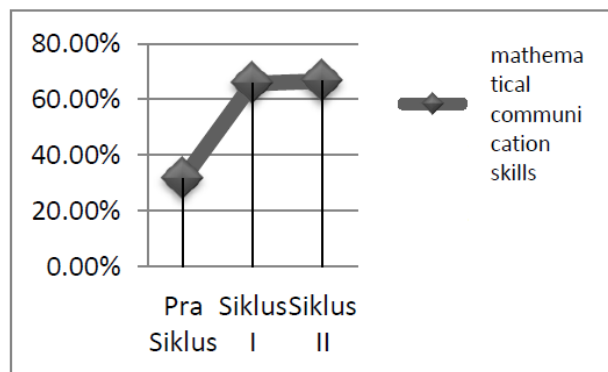
Increased communication skills in mathematics learning math in elementary school-based contextual Taman Muda Yogyakarta indicated by, 1) Students are able to listen, discuss, and write about mathematics ideas .Before that, given action learning takes place when students tend to talk and play with her friends as well as when the discussion group so that students can not understand what is being discussed and when asked to write mathematical

ideas to solve the student was not able to, but after the action of the application of contextual learning students have an interest to participate in the learning process so that students are able to listen, discuss, and write about ideas mathematics, 2) Declare a daily occurrence in the language of mathematics. Before granting the action, students are not able to understand about the story, so that when students see the story about the little interest in working on a story about those. It will but after the action in the form of associate professor of mathematics teaching material in the context of everyday life, students are more motivated to keep learning in addition to the current see about the story in the context of students everyday able to understand and express the daily events in mathematicslanguage, 3) Able to explain mathematical concepts by using their own words. Before administering the actions of teachers tend to explain mathematical concepts by having students observe about the book exercises and textbooks, so most of the students do not understand, but after being given the actions of teachers explain math concepts by engaging the students to find their own math concepts students are better informed, and mathematical ideas by using their own words.

This is consistent with research Sutama, et al (2013) that conveyed the indicator showing to improve communication math, among others: 1) Declare mathematical ideas through spoken or oral, 2) Describe the idea into a mathematical model, 3) Write a mathematical idea into visual form, 4) Explain the concepts of mathematics. The achievement, according to Umar (2012) which argues attention to students 'mathematics communication is already "built in", in the sense that the syntax or step learning is already supporting efforts to develop students's ability to communicate. How students communicate their ideas in an attempt to answer the teacher's contextual issues, how students actively participate in discussions, negotiations and how the students "accountable" acquisition of their answers to open questions and tasks set by the teacher, clearly requires the ability to communicate.

From field observations, data communications capabilities math on math learning with contextual approach as follows; in the first cycle the first meeting in the classical mathematical communication skills attainment percentage of 36.67%, which means students mathematical communication skills including into the low category, in the first cycle II meeting in classical mathematical communication skills acquisition percentage of 46.67%. Meanwhile percentage gain mathematical communication skills in writing amounted to 75.55% in general .It meansfourth grade students Taman Muda Yogyakarta in writing have the communication skills of mathematics included in either category. In cycle II, based on the observation at the first meeting in the classical mathematical communication skills attainment percentage of 56.67% or included in the category fairly and meeting II in classical mathematical communication skills acquisition percentage of 65% or included in either category. From the data obtained from the observation of the second cycle of the average mathematics communication ability in

mathematics learning with contextual approach was 60.83%, for data communication capabilities document scrutiny mathematics at the second cycle was obtained 77.77% .As for the increase of the pre-cycle towards the first cycle is very significant, that is equal to 34.06%. With 31.67% in the pre-cycle and 65.73% in cycle I. Whereas in the first cycle towards the second cycle increased by 0.75%, from 65.73% to 66.48%.

Based on the results of research carried out in SD Taman Muda Yogyakarta is known that the implementation of mathematics learning with contextual approach proven to improve the communication skills of mathematics and a positive influence for students. This thing can be known from the data above. Which occurred a significant increase in learning mathematics using a contextual approach, especially in students mathematics . The impact of positive communication skills is a goal that is expected from the research that has been doing. One goal of this research is to improve the communication skills of students with student success indicators have the communication skills of mathematics reached ≥ 60% in the classical style.

IV. CONCLUSION

Contextual learning can significantly improve mathematical communication skills for students. With contextual-based mathematics instruction has the potential to be applied in the field. In the pre-action communication skills of students mathematics in elementary Taman Muda Yogyakarta 31.67%, while after the action by applying a contextual-based mathematics instruction mathematical communication skills of students increased by 33.33%, to 65% or has exceeded expectations attainment communication skills math students in Taman Muda Yogyakarta elementary school.

Increased communication skills in Taman Muda Yogyakarta elementary school marked by the achievement indicators of success in improving the communication skills of mathematics indicated by, (1) Students are able to express ideas or ideas with mathematics verbally sentence, (2) Students are actively involved in discussions about math, (3) Students can formulate definitions and generalizations about the math,(4) Students can formulate a definition of mathematics by using its own wordsThe various needs of our gratitude to the various parties.

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