



ANALYSIS OF STUDENT'S SELF CONFIDENCE AND MATHEMATICAL COMMUNICATION IN RECIPROCAL TEACHING WITH MEDIA 'WAYANG'

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ABSTRACT

The purpose of this activity is to describe the student's self confidence and mathematical communication on reciprocal teaching with media *wayang*. Observation conducted on grade VII MTs Hasyimiyah Kalisidi Ungaran. The results showed that 1) subject who his self confidence belong to below group has not been able to express his opinions in group discussions and class discussions; 2) subject who his self confidence belong to middle group has been able to express opinions in group discussions; 3) subject who his self confidence belong to above group has been able to express opinions in group discussions and class discussions; 4) the most visible difference between the groups is the courage of speaking idea and optimism; 5) Student's self confidence increased; 6) the stages of reciprocal teaching can improve the aspect of mathematical communication; 7) Student's oral mathematical communication improved on discussion; 8) Student's writing mathematical communication improved during predicting stage and individual tasks; 9) There are differences mathematical communication skills of students by groups of self-confidence.

Key Word: Mathematical Communication; Reciprocal teaching; Wayang; Self Confidence

INTRODUCTION

Communication skills are often be the first rank aspects that affect the success of the work. Communication is the process of delivering ideas from one person to another (Majid, 2013 : 282). Mathematics learning can develop students communication skills. In mathematics, there is mathematical communication. Through communication, an idea will be the object of thought. When students are challenged to convey their thoughts to others verbally and in writing, they learn to express more clearly, convincingly, and more appropriately in their mathematical language. Explanations must contain mathematical opinions and rationally, not just descriptions or summaries. Listening to the explanations of others gives students the opportunity to develop their understanding (NCTM, 2000).

Baroody (on Qohar, 2011) stated five aspects of communication, which is representating, listening, reading, discussing and writing. Mathematical communication skills in class VII A MTs Hasyimiyah Kalisidi Ungaran still low, as seen during the mathematics learning. Students tend to be still difficult to communicate their mathematical ideas orally or in writing. Four aspects of communication mathematics

class VII A still lacking, that shortcomings should trigger the teachers to continue providing learning model that can develop students' communication skills. Learning model that can develop students' mathematical communication is discussion. The VII-A math teacher has been implementing learning by discussion but there are still many flaws. For example, during the discussions, only one of the students who tried to solve problems, while other members were busy talking with other group members. Lianghuo (2007) stated that is very effective to make mathematics learning with an oral presentation in which teachers and students have a wide variety of roles and responsibilities during the lesson. One of learning model which gives a role to each member of the group is reciprocal teaching.

Reciprocal teaching is cooperative learning where one member of the group serves as a teacher and conducted alternately. Student who plays the teacher leads the group members in carrying out the stages of reciprocal teaching (Palinscar, 1984). There are four stages in the reciprocal teaching that is clarifying, at this stage one of the students served as the leader of clarification or clarifier. Then predicting, at this stage one of the students serving as leader called predictor. Third, questioning, at this stage one of the students serving as "question leader/questioner". And the last stage is summarizing. While teachers act as facilitators

that provide convenience, and counselors who scaffolding the group (Garderen, 2004). Qohar (2009) stated that the aspect of students' mathematical communication skills can be improved through reciprocal teaching.

One of the factors that affect students' mathematical communication skills is self-confidence. Suhendri (2012) stated that self confidence to positively affect mathematics learning outcomes. Rohayati (2011 : 38) also stated that students self confidence must be noted by the teacher. Students who have high self-confidence will improve their mathematical communication skills, because they will not be afraid to express their opinions, ask questions and even refute statements from another student. This will led the interaction between students and students, and teachers and students. Self-confidence can be developed by providing story problems that inspire, for example wayang story. Wayang is one of the Javanese cultures.

Learning by using media wayang and wayang story context can develop students character. Nurgiyantoro (2011) stated that a variety of wayang story and wayang characters is used as many role models, the principle of life, sources of values life, or at least affect the attitude of their fans. Wayang is not just an art form which is popular, but it has become part of life required by the community.

METHODS

This research using qualitative and quantitative methods. Students mathematical communication and self confidence will be analyzed quantitatively then described qualitatively. This research conducted on class VII-A MTs Hasyimiyah Kalisidi Ungaran. Research subjects were 12 students of class VII-A. This subject were classified based on their self confidence.

This study begins with reciprocal teaching, when the learning takes place, the observer assess oral communication skills and students self confidence. The results of these observations will be analyzed qualitatively. Then students were given mathematical communication test. The results are analyzed quantitatively and qualitatively with the support of the interview about the students difficulties on learning and difficulties when solved the test questions. In this study qualitatively be the focus, while quantitative used as supporting data for qualitative analysis.

RESULT AND EXPLANATION

Before getting the research results, instruments be validated by experts. Validation includes syllabus, lesson plans, textbooks, worksheets, TKKM, questionnaire and observation sheets. Based on the validation results we concluded that the instruments have been valid and can be used with slight revisions.

The subject self confidence of research can be seen in Table 1 below.

Table 1 Subject Self Confidence

Subject	Group	Self Confidence aspect				
		Optimism	Independent	objective	Responsible	Courage to speak their ideas
S-12	Below	average	average	low	good	average
S-03	Below	average	good	average	average	average
S-04	Below	average	good	average	good	average
S-06	Below	average	good	average	good	average
S-01	Middle	good	good	average	average	average
S-20	Middle	average	average	good	average	+ good
S-10	Middle	average	good	average	average	average
S-14	Middle	average	good	good	average	good
S-16	Above	good	good	good	good	good
S-17	Above	average	good	average	good	good
S-15	Above	good	good	average	good	good
S-11	Above	good	good	good	good	good

Based on table 1, the most visible difference between the groups is the courage of speaking idea and optimism. Below group in early learning can not express their opinions either in group discussions or class discussions. Middle group can express their opinions in group discussions. Above group can already express their opinions in a discussion group or class discussion.

Students with high confidence will not hesitate to express their opinions in public.

Optimism difference between the groups that is the subjects of the above group has confidence in theirself and their abilities. While that for the below group subjects are still not confident of their ability and still rely on other people. Optimism affects objectivity,

independence and responsibility. When students have good optimism, they won't rely on other people so their independence will be good too.

We used Gain test to find out about subject self confidence improvement. We compared subject initial self confidence and subject final self confidence based on questionnaires and observations. The test result can be seen below on table 2.

Table 2. Gain index of subjects self confidence

Subject	Pretest score	Posttest Score	N-Gain	Remark
s-12	2.04	2.78	0.37	average
s-06	2.11	2.9	0.41	average
s-03	2.3	2.97	0.39	average
s-04	2.26	2.92	0.38	average
s-01	2.4	3.09	0.43	average
s-20	2.47	3.02	0.35	average
s-10	2.54	3.02	0.32	average
s-14	2.33	3.04	0.42	average
s-16	3	3.3	0.3	average
s-17	2.8	3.1	0.306	average

s-15	2.97	3.4	0.448	average
s-11	3.3	3.57	0.37	average
average			0.3745	average

Based on Gain test, we can conclude that the 12 research subject have self confidence improvement after took reciprocal teaching with media wayang. Based on the interviews results with 12 subjects showed that subjects preferred the reciprocal teaching compared with teacher-centered learning. The subject self confidence improve because they were pleased with the learning process. When students like learning process then they will be confident in following study. Students will not be afraid to ask questions and express opinions. The improvement also occurred due to the motivation of both teachers and wayang. Wayang stories provide inspiration for students to improve the character of confidence so that students succeed in math.

Mathematical communication ability of 12 subject can be seen in table 3.

Table 3. Mathematical communication ability

Subject	Group	Oral mathematical communication					Written mathematical communication			
		1	2	3	4	5	1	2	3	4
S-12	Below	low	low	low	low	average	average	low	low	average
S-03	Below	average	low	low	low	average	average	low	average	average
S-04	Below	average	low	low	average	average	average	low	low	good
S-06	Below	average	average	low	good	average	low	low	low	average
S-01	Middle	average	average	average	good	good	good	low	good	average
S-20	Middle	average	average	low	good	good	good	average	average	average
S-10	Middle	average	average	average	average	good	good	good	good	average
S-14	Middle	average	average	good	good	good	average	low	average	average
S-16	Above	good	good	good	good	good	good	average	good	good
S-17	Above	good	good	good	average	good	good	good	good	good
S-15	Above	good	good	average	good	good	average	average	good	average
S-11	Above	good	good	good	good	good	average	good	good	good

Oral mathematical communication indicator :

1. Explaining ideas, situations and mathematical relationships orally with real objects, pictures, graphics or algebra.
2. Explain verbally their understanding of a mathematical written presentation.
3. Stating a daily occurrence in the mathematics language or symbol verbally.
4. Explain and make question about mathematics that have been studied.

5. Coherently answer in solving mathematical problems.

Written mathematical communication indicator:

1. Explaining ideas, situations and mathematical relationships in writing with real objects, pictures, graphics or algebra.
2. Stating a daily occurrence in the mathematics language or symbol in writing.
3. The ability to use mathematics terms, notations and its structures to present ideas, describe relationships with models of the situation.

4. Coherently answer in solving mathematical problems.

Below groups are still difficult in communicating their opinions either in a group or class discussions. So their oral mathematical communication ability still lacking. Below group also has shortcomings in declaring a daily occurrence in mathematical language both oral and written.

Middle group are able to communicate their opinions in the group but still hesitant when expressed the opinion in a class discussion. Several subject of middle group also has shortcomings in declaring a daily occurrence in mathematical language both oral and written.

Above group was able to communicate their opinions in group and class discussions. Oral and written mathematical communication of above group on already good. This is because the subject of above group having a good optimism that they will not hesitate in doing something. Subjects of above group can provide the reasons for each step when solving problems.

The stages of reciprocal teaching can improve the mathematical communication aspects. They improved communication in the process of clarifying. In the process of clarifying the students are required to read and understand the material that will be studied. In this stage, they will improved reading skill. Clarifier will explain the material to the group discussion after students read the material. When clarifier explain the material his discussion skill improve. While the other member improved their listening skill. And their writing skill improve during predicting stage.

The problems that use wayang stories can improve mathematical communication ability, especially on indicator stating a daily occurrence in the mathematics language or symbol in writing. Wayang stories are basically a part of everyday life for example wayang box. Based on the Kruskal-Wallis test was obtained $\text{sign} = 0.007$ so $\text{sign} < 0.05$. It can be concluded that the mathematical communication above, middle and below group are different. This communication ability differences caused by differences in students' self confidence.

CONCLUSION

The most visible difference between the groups is the courage of speaking idea and optimism. The students self confidence has increased after doing reciprocal teaching with wayang media. Increased confidence caused by several factors, among others,

wayang stories that inspire, and reciprocal teaching that requires students to express their opinions in discussions. The stages of reciprocal teaching can improve the mathematical communication aspects. Improving the ability of oral mathematical communication occurs during group discussions and class discussions. Written communication skills improved during the process of predicting and providing individual tasks. There are differences mathematical communication skills of students by groups of self-confidence.

Reciprocal teaching provide a forum for students to communicate their opinions. Students who acts as a clarifier should have good confidence and mathematics learning outcomes. If clarifier can explain the material being studied, the process of reciprocal teaching can run well. Meanwhile for the role of predictors, questioner and summarizer must have good confidence, especially in the aspect of speaking their ideas.

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