CHAPTER V
CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

Based on the results of research and discussion, conclusions can be drawn to answer the formulation of the problem, namely:

1. The level of mathematical communication ability of class VIII-6 students of SMP Negeri 35 Medan with the application of the *Jigsaw* cooperative learning model is relatively high. This is because most students have been able to meet the indicators of mathematical communication skills used in this study, namely: (1) *Drawing*: Students are able to reflect real objects, pictures, and diagrams in mathematical ideas, (2) *Mathematical Expression*: Students Able to express mathematical ideas using symbols or mathematical language in writing and in the form of mathematical models, (3) *Written Text*: Students are able to provide answers using their own language, in a systematic, reasonable, correct, and completely arranged manner. It was found that the number of students with deficient assessment categories was 6 students (20%), students with good enough criteria were 4 people (13,33%), students with good criteria were 12 people (40%) , students with very good assessment criteria amounted to 8 people (26,67%). There are 24 students who have achieved KKM (Minimum Completeness Criteria) or 80% which are divided into 3 categories, namely quite good, good, and very good. These three categories can be classified into a high level of communication skills.

   - Students with very good ability grouping (S-15) is still unable to fulfill the first indicator. S-15 does not describe the 2 cube shapes requested in the problem. S-15 was wrong in capturing the information asked in the problem. In the problem, it is asked to draw an illustration from a Rubik's

Cube and cardboard. However, S-15 did not describe the cardboard in the answers, the students only described the rubik's cube.

- Students with good ability grouping (S-07) is still unable to fulfill the second and third indicator. S-07 cannot to change what is known in the problem into mathematical symbols. Subject S-07 does not use mathematical symbols when mentioning the edge of the cube, and S-07 also writes the length of the cube in the known part, which should be the second edge of the cube. S-07 cannot write a conclusion (final answer) using his own language completely and systematically. The answer from S-07 looks very short and looks monotonous.

- Students with good enough ability groups (S-24) is still unable to fulfill the first and second indicator. All the illustrations depicted by S-24 do not contain the information already given in the problem in the form of the surface area of the cube along with the length. S-24 has not been able to understand the symbols contained in the formula for the surface area of a cuboid, so S-24 cannot distinguish the square of a number with number multiplied by two. S-24 also experienced an error in applying the formula for the volume of a cuboid.

- Students with deficient ability grouping (S-11) have not been able to fulfill the first, second and third indicators. S-11 has described the shape of the cuboid correctly but is incomplete and not in accordance with the instructions in the question. S-11 has not been able to use mathematical symbols in writing down the information asked in the cuboid volume problem and has not been able to apply the cuboid and cube formulas to solve problems in the problem. S-11 subjects are still seen guessing answers because they cannot use the formula of cuboids and cubes in solving problems in the problem so they cannot do calculations or get solutions completely and correctly.

2. Based on research findings developed from four types of difficulties carried out by students of SMP Negeri 35 Medan, it can be seen the difficulties experienced by students in solving student mathematical communication test

questions. The four types of difficulties are facts, concepts, operations, principles difficulties. The fact difficulties that students did were: a) do not write down the volume of the cardboard and the number of Rubik's cubes that could be put in the cardboard at the conclusion of the final answer by S-07 b) do not understanding the symbols contained in the formula for the surface area of a cuboid, so he could not distinguish s squared from s multiplied by two by S-24 c) can't describe the illustration of the pond image according to the information contained in the problem so that it is difficult for students to determine the elements being asked from the problem by S-24 d) they were not able to understand the elements contained in the formula for the surface area of a cuboid, so it cannot distinguish the height and width of a cuboid by S-11. e) do not know to write down the information that was known and asked from the questions by S-28. Concept difficulties experienced by students, namely: a) can't provide an example of a cuboid in the room by S-24, b) don't know what the definitions of cuboid by S-11, c) didn't know what the definition of the cuboid volume by S-28. The difficulty of the operations carried out by students, namely: a) the calculations carried out by students do not write down correctly and completely, so that the final result of solving the problem is not found by S-07, b) don't write down the steps in solving the problem about surface area of a cube completely by subject S-24. Difficulties in principle that students do, namely: a) wrong in applying the formula for the surface area of a cuboid to solve the problem by S-11 and S-28 b) wrong to write the formula to solve the problem, S-28 just multiply all the known edges in the problem.

5.2 Recomendations

Based on the discussion in chapter IV and the conclusions, to foster mathematical communication skills in learning mathematics students are suggested for mathematics teachers as follows:

1. Can be used as a reference for teachers of SMP Negeri 35 Medan to determine the appropriate approaches, strategies and learning models to plan and carry out the learning process in class according to abilities.

2. The teacher should provide more examples of questions and practice questions so that students are more skilled at working on questions and understand how the procedure for solving problems related to the material of flat sided spaces.

3. The teacher should provide understanding to students to write down the information that is asked and known on the scal as well as conclusions at the end of solving a problem that has been found.

4. The teacher should use a method that can instill the concept of flat side shapes so that students understand and remember the flat side shape formulas when working on problems.