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Weakness Analysis Learning Mathematics Junior High School in Medan

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Weakness Analysis Learning Mathematics Junior High School in Medan

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Abstract. Mathematics is the science that is structured and deductive object of study that includes an abstract form of facts, concepts, principles and procedures rests on an agreement, deductive thinking patterns, have an empty symbol of sense, pay attention to the universe of discourse and consistent system. Mathematics has a language and a well-defined rules, a clear and systematic reasoning, and the structure and the linkages between the concept is strong. The main elements of the mathematical work is deductive reasoning which works on the basis of assumptions and have a consistent truth. So that mathematics is known as a deductive science, which means that the mathematics starts from an undefined elements, axioms / postulates and ultimately lowering the theorem. Math formed as a result of human thinking which relate to the idea,Mathematics is the fruit of human thought that the truth of a general nature which does not rely on the scientific method that contains the inductive process. Mathematics is one of the most important auxiliary science and useful in everyday life as well as in supporting the development of human resources and the development of science and technology. Such formal mathematics taught since elementary school through college. Therefore, school mathematics learning should take place effectively and with quality.

1. Preliminary

Education and teaching has always been a problem and a challenge for every country that had nothing incessantly in the formation of human resources really are. It can come from various sources such as the advancement of science, technology, population growth, changes in the education system, the limited ability of teachers, limited funds, and others. It is recognized that educational development is a complex issue because it involves many aspects and dimensions and involves many parties with issues that are interconnected, and spacious. Mathematics is one of the most important auxiliary science and useful in everyday life as well as in supporting the development of human resources and the development of science and technology.

Mathematics is a means of thinking to cultivate the mindset of a logical, systematic, objective, critical and rational that must be nurtured since basic education. The development of science and technology requires mathematical finding new forms as both a science and in terms of learning [1]. The purpose of learning mathematics in primary and secondary;1) Understanding the concepts of mathematics, describes the relationship between concepts and apply concepts or algorithms in a flexible, accurate, efficient and precise in problem solving, 2) Using the reasoning in the patterns and nature, perform mathematical manipulation in making generalizations, compile evidence, or explain ideas and statements of mathematics, 3) Solve problems that include the ability to understand the problem, devised a mathematical model, solve the model and interpret the obtained solution, 4)

Communicate ideas with symbols, tables, diagrams, or other media to clarify the situation or problem, and 5) have respect usefulness of mathematics in life, which is curious, attentive, *National Council of Teachers of Mathematics* or NCTM (2000), states that school mathematics standard includes mathematical content and mathematical processes. The standard covers the process of problem solving, reasoning and evidence, connections, communication, and representation [3]. The process standards together constitute the basic skills and understanding is needed of the students in the 21st century. Standards describe the basic skills and understandings that students will need to function Effectively in the twenty-first century" [3]. So, stnadar process is the main basis of school students need to have in the 21st century. Meeting result with teachers, especially teachers of mathematics, such as the activities of Congress Subject Teacher, upgrading or activities Teacher Education Training Program, many of those who did not master math concepts or materials that will be taught [2]. The math scores of students from elementary to high school is not adequate to be applied in accordance with its function, even three years is currently declining [5]. It can be caused by various factors such as the school, the teacher factor, the factor of students. The one of the factors attendant to quality education is ongoing education are less meaningful for personal development, attitude and characteristics of learners that resulted in the decline of personality and awareness of the true meaning of life [6].

Mathematical truths are essentially coherent. As it is known in the world of science, there are three kinds of truths: (1) the truth of coherence or consistency, that is the truth that is based on truths already received, (2) the correlation truth, that truth which is based on the "fit" with the reality or the facts, such as "the number of angles of a triangle is 180 °, and (3) the pragmatic truth, the truth which is based on the benefit or usefulness. The statement is true, not because we did experiment but because according to our logical mind [11]. Factors that can lead to errors of students in mathematics, namely; a) The internal factors are factors that comes from within the student's own both biological and psychological example intelligence, physical weakness, wrong attitudes and habits in specific study material. Error type in question in this case is an error in solving a mathematical problem, and are grouped into three types of errors as follows: 1) Errors concept is a mistake in understanding mathematical concepts is a prerequisite nor a mathematical concept that has been taught 2) Errors principle is a mistake in the associate some facts or some concept of solving mathematical problems, 3) Error carelessness includes one count and one write in solving mathematical problems. b) External factors are factors that come from outside the student's itself, such as the environment, whether in the form of the natural environment, for example where learning, the teacher's teaching methods, atmosphere, weather, lighting, and so on, as well as in the form of social environment that is associated with human interaction [9].

There are two major problems in mathematics education in Indonesia is poor performance of their students as well as a lack of interest in learning mathematics. This resulted in student achievement Indonesia is still low and has not been as expected. TIMSS 2011 survey results Indonesia ranked 38th out of 42 participating countries, with a value of 386. Then the results of PISA in 2015, putting students Indonesia ranks 65 out of 70 participating countries [4].
An important thing to do in an effort to improve the quality of education, especially math learning in school is by knowing the actual weaknesses done in the learning process. Therefore, this study will describe the weaknesses factual happens in mathematics at school, both in terms of learning that takes place, the ability of teachers to manage learning and of things mathematical skills of students, especially in the ability to process standards of mathematics that includes the ability pemechan problems, reasoning, communication, connection and mathematical representations.

2. Research methods
This type of research is a case study, which is about the weakness kelmahan mathematics learning that took place in Medan to standard mathematical process that includes problem-solving abilities,

reasoning, communication, connection and mathematical representations. Samples taken in this study is SMPN 2, SMPN 6, SMPN 11, SMPN 27 and SMPN 35 are drawn randomly.

The method used in this research is descriptive in describing an actual fact through observation, interviews, documentation, questionnaire and test. Data collection techniques used through observation, that is destined to get information about the picture and population situations.Interviews were conducted to obtaininformation pertaining to the kinds of mistakes made by the students and the factors that cause students to make mistakes in solving mathematical problems. Math test used is included issues relating to the standard capabilities of the ability of mathematical processes; problem-solving, reasoning, connections, communications and mathematical representation.Technique The data analysis used in this study is in the form of qualitative and quantitative approaches. Qualitative techniquesto determine the type of fault and cause students to make mistakes. Technique Quantitative untuk calculating the percentage of wrong answers and the correct use of quantitative data. The process of qualitative data analysis activities in This research carried out with the following steps: (1) correcting the results of students' work, (2) counting the number of students who answered correctly and one on each item, (3) describe the many errors of students each type of error, (4) calculate the percentage of the number of students each type of error, (5) describe the type of error on every items, (6) determine the students who will be interviewed as many as three people per class, (7) interviews of students who have been the subject of more in-depth research.

3. Research result

This study aimed to describe the weaknesses of factual learning, including the weakness of social competence, competence keprebadian, professional competence and pedagogical competence of teachers, including developing syllabi and learning rencangan, the selection of teaching methods and the use of media. In addition, this study will describe the weaknesses of junior high school students in Medan on standard capabilities include the ability to problems solving, reasoning, connection, communication, and representation. Here are the results of research in the field.

3.1. Implementation of learning at SMPN 2 Medan

Implementation of the learning process in SMPN 2 Medan which lasted still concentrating on brain cognitive ability level of understanding tends on memorization, whereas affective abilities have not grown and barely developed seriously and systematically. Proses learning takes place in one direction rigid and less involving interaction and mental activity of students. Students are rarely given the opportunity to find his own knowledge, and often simply using a formula that is so. The results of the interviews conducted to some students indicate that they are less interested in taking a lesson, math, scared, anxious and depressed. In observation activities conducted in the SMPN 2 Medan, we test the problem solving kepda eighth grade students were 30 students, with the following results.

Table 1. Achievement of Mathematical Problem Solving Ability students

Learning objectives	% Achievement of Learning Objectives	Information
Students are able to understand the problem	75.28%	Reached
Students are able to plan troubleshooting	80.83%	Reached
Students are able to solve the problem	72.5%	Not achieved
Students are able to check back in solving problems	68.33%	Not achieved

From the data in the table above, based on indicators of students' mathematical problem solving ability, accomplishment indicators of students' mathematical problem solving ability is the lowest in all four indicators of the ability of the solution meriveu students' answers, which amounted to 68.33%. It can be concluded that the mathematical problem solving ability of students still experiencing problems and need to be improved through research.

3.2. Implementation of learning at SMPN 6 Medan.
The implementation process of learning in SMPN 6 Medan lasting visible one-way, active teachers provide an explanation of the theory, and give examples and then provide exercise, and less involving interaction and mental activity of students. In presenting the mathematics materials, teacher spoke in a voice firm and slightly coarse language heard by the ear, for example, teachers in the learning process using the word "you" to her students and only occasionally use the word "son". At the moment the process of learning most students active, but there are also some students who just passively listening to the explanation of the teacher alone even some tinkering.

Then the teacher explains the lesson in front of the class while doing a debriefing to jointly find a general formula of then. After that the teacher gave the assignment to the students to work on the problems that exist in the students' worksheets. Students in working on such questions, there were discussed diligently, there is a walk to his desk to see his work and some play. This suggests that learning does not cultivate an interest and motivation to learn mathematics students. In general it can be said that learning is done not according to plan learning programs be made. Of 3 problems penaralan mathematical ability test given to class IX-2, found the results that no student who has a very high reasoning ability category. The number of students who fall into the category of low reasoning ability in as much as 7 out of 15 students, or about 46.67%. Number of students who fall into the category in reasoning ability is very low as many as 8 out of 15 people or about 53.33%. And an average of 40.867 ranges reasoning skills students are included in the low category.
Analysis of students' responses per indicator reasoning ability can descriping as follows:

- Presents a mathematical statement, either orally, in writing, drawings, and diagrams. Judging from the student's ability to present a mathematical statement, either orally, in writing, drawings, and diagrams, there are 0 of 15 students who are at very high category, 0 of 15 students who are in the high category, four of 15 students or 26.67% were are in the category of moderate, 4 out of 15 or 26.67% in the low category, and 7 out of 15 students or 46.67% in the very low category. The average score of students in presenting a mathematical statement in writing, and drawing on tests of mathematical reasoning ability was 4.13. Its means that the average student has the ability to lower categories at present aspect mathematical statement in writing, and drawing.
- Asking Allegations. Judging from the students' ability in the filed allegations, there are 7 of 15 students or 46.6%, which is at a very high category, 0 of 15 students who are in the high category, 0 of 15 students who are in the moderate category, two of 15 students or 13.3% in the low category, and 6 out of 15 students or 40% in the very low category. The average score of students in the filed allegations on tests of mathematical reasoning ability was 7.67, which means that the average student has the ability with high category on aspects put forward allegations.
- Perform mathematical manipulations. Judging from the students' ability in filing alleged, there were 15 of 15 students or 100%, which is the category of very high, 0 out of 15 students who are in the high category, 0 of 15 students who are in the category of being, 0 of 15 in the low

category, and 0 of 15 students at a very low category. The average score of students in performing mathematical manipulations on tests of mathematical reasoning ability is 15.00, which means that the average student has the ability to very high category on aspects perform mathematical manipulations.

- Compile evidence, reasoning or evidence against some solutions. Judging from the students' ability in compiling evidence, reasoning or evidence of some solutions, there are 12 out of 15 students or 80% of which are in the category of very high, 0 out of 15 students who are in the high category, 0 of 15 students who are in the category of being , 0 of 15 in the low category, and 2 out of 15 students or 20% in the very low category. The average score of students in compiling evidence, reasoning or evidence against some solusipada tests of mathematical reasoning ability is 8, which means that the average student has the ability to prepare high category on aspects of evidence, reasoning or evidence against some solutions.

- Drawing conclusions from statements. Judging from the students' ability to draw conclusions from the statement, there are 0 of 15 students who are at very high category, 0 of 15 students who are in the high category, 0 of 15 students who are in the moderate category, 8 out of 15 students or 53.33 % in the low category, and 7 out of 15 students or 46.67% in the very low category. The average score of students in drawing conclusions from statements in mathematical reasoning ability test is 26.7 which means that the average student has the ability to very low categories of the interesting aspects of the statement concluded.

- Checking the validity of an argument. Judging from the students' ability to check the validity of an argument, there are 0 of 15 students who are at very high category, 0 of 15 students who are in the high category, one of 15 students or 6.67% which is the medium category, 0 of 15Now low category, and 14 out of 15 students or 93.337% at the very low category. The average score of students in drawing conclusions from statements in mathematical reasoning ability test was 5.3, which means the average student has the ability to very low categories on aspects of checking the validity of an argument.

- Finding the pattern or nature of the symptoms mathematical generalization. Judging from the students' ability to find patterns or mathematical nature of the symptoms to make generalizations, there is one of 15 students or 6.67% which is at a very high category, 0 of 15 students who are in the high category, 0 of 15 students who are in category of being, eight of 15 students or 53.3% in the low category, and 6 out of 15 students or 40% in the very low category. The average score of students in finding a pattern or mathematical nature of the symptoms to make mathematical reasoning ability tests is 36.6. Its that the average student has the ability to very low categories on the aspect of finding patterns or mathematical nature of the symptoms to make generalizations.

While the ability of a teacher of mathematics in solving mathematical reasoning similar to the students' problems, teachers get a total score of 83. It is not comparable to the average ability of learners to be in a low level. [8] Teachers sought to improve the mathematics ability and mathematics teaching efficacy of preservice teachers by incorporating mathematics into an education teaching methods course.This is possible because the model or strategy used by the teacher in the learning process is not quite right.

3.3. Implementation of learning at SMPN 11 Medan.

In the learning process, the teacher comes to class immediately start the lesson by conducting a question and answer about the previous lesson. Students at the beginning of the active subjects answered questions from the teacher. Then the teacher explains the material "Area of a Circle" using props is a complete circle and circle that has been cut pie-shaped circle. When the teacher pointed to one of the students who was in front using props to find the area of a circle, some students who are behind less attention because they are overheated after gym class, but when the student is using the props they begin to refocus.

Standard processes tested at this school is about the ability of the mathematical connection that includes the student's ability to connect mathematical concepts of mathematics to everyday life, connecting anta concepts with mathematical concepts, and linking with other fields of mathematical concepts. In accordance with the test results of students mathematical connection capabilities acquired through the provision of a test, then analyzes the students' answers. At first the mathematical connection indicator, namely connects mathematics to everyday life. This is evident from the acquisition of student scores, where the average percentage of students who received a score of 6 and 4 there are 6 people (18.75%), which obtained a score of 5 No 8 (25%), which obtained a score of 3 and 1 no (0%), which obtained a score of 2, there are 10 people (31.25%), which obtained a score of 0 No 2 (6.25%).

In connection indicator the second mathematical, namely the relationship between objects with mathematical concepts, many students have not been able to present or translate intent matter. It can be seen from the results of the analysis of students' answers, where several students to answer the problem by not completely and correctly. Most students tend to be difficulties in translating the question, so that students experience difficulties in solving problems. It is also evident from the score acquisition students, where the average percentage of students who received a score of 6 No 3 (9.38%), which obtained a score of 5, 3, and 1 no (0%), which obtained a score of 4 there 10 (31.25%), which obtained a score of 2, there are 15 people (46.87%), and obtained a score of 0 had 4 people (12.5%). So, most of the students have not been able tointer-connecting with the object concept mathematics.

In indicator connection mathematical a third, namely the relationship between mathematics and other fields, the majority of students have not been able to give a conclusion on the questions asked, and also there are students who are wrong operate what is known in the matter, they miscalculated and used the wrong way , in other words the students do not understand the material congruency. It is also evident from the score acquisition students, where the average percentage of students who received a score of 4 there were 10 (31.25%), which obtained a score of 3 and 2 No 0 votes (0%), which obtained a score of 1 No 18 (56.25%), and obtained a score of 0 had 4 people (12.5%). That means that most of the students have not been able toconnecting mathematics and Another field.

Analysis result showed that in addition to the factors of each of the indicators that are different difficulty levels, other factors that cause the low value of the student is understanding the concept of congruency students are still low. It is also because the instruction in question were given to students are still not in accordance with what is expected. [10] Besides that, there is a consistent pattern where students with field independent dimensions appear significantly more than students with field dependent dimensions in almost all areas curriculum. While the ability of teachers to the mathematical connections including high category, a total score of 10 out of 12.

3.4. Implementation of learning at SMPN 27 Medan

The implementation process of learning at SMPN 27 Medan lasting one-way, active teachers provide an explanation of the theory, and give examples and then provide exercise, and less involving interaction and mental activity of students. Teachers come to class directly addressed the students and encourage students to pray according to the teachings of their respective religions. Teacher explaining homework and write the correct answers on the board. Students examine the work of his friend's house and grades. Students then collect homework books that have been rated and teachers to enter the value of homework to the list of values. Teacher explains the material on determining the number of subsets using pascal triangle. Once finished explaining, the teacher asks whether the student has understood or not, and provide an opportunity for students to take notes. Then the teacher asks the students to do the exercises in textbooks. So, the lesson is the teacher direct instruction in classical and teacher-centered.

Then the teacher asks the students to do the exercises in textbooks. So, the lesson is the teacher direct instruction in classical and teacher-centered.

In terms of teacher-made learning program plan, which is obtained from the school indicate that the existence of a difference in the format of writing in learning activities. Some use the core activities of the exploration stage, elaboration and confirmation. While others use a direct process to discuss the teacher's activities such as providing materials and provide matter for discussion. However, the general plan made learning program shows the learning activities tends to be centered on the students. This is in contrast with the implementation of learning in the classroom in real which tend conventionally onlyrely lecture.

Standard mathematical process that measured at SMPN 27 Medan is a mathematical communication skills. From 6 about mathematical communication skills tested in narrative form with the range of scores 0-100, students gain scores with the results of its analysis as follows.

Table 2. Achievement Communication Skills Math Students

Category: Communication Capabilities	Communication Capability Level Students	Many Students	Percentage Number of Students	On average ability students
$100 \leq 90 \leq TKKM$	Very high	0	0%	59.17
$\leq 80\ TKKM <90$	High	13	28.89%	
$\leq 65\ TKKM <80$	Enough	11	24.44%	
$\leq 56\ TKKM <65$	Low	10	22.22%	
$0 \leq TKKM <56$	Very low	11	24.44%	

Based table above, it appears that no student who has a mathematical communication skills very high level, while the level of ability is very low 24.44%. This shows students' mathematical communication skills low level. This suggests that the ability of mathematical communication in junior high school students need to be an effort to improve communication skills through the study of mathematics students are integrated.

When viewed on the analysis of mathematical communication skills of students based on the indicator, the obtained achievements of students on the first indicator that express mathematical ideas through oral, written, and visually demonstrate and describe average reached 46.67%. It is shown that some students are highly skilled and are already able to deal with them properly to describe it in the arrow diagram. The second indicator, understand, menginterpestasikan, and evaluate mathematical ideas, either orally, in writing, or in other visual forms, the average achievement of students 54.83%. Likewise the third indicator that uses terms, the notation of mathematics and its structures to present ideas, describe the relationships with models in problem solving situations, the average achievement of students is 58.25%. Students having difficulty in understanding the problem. On the indicator 4 is declared a situation into the language, symbols, ideas, or mathematical models, students achieved an average 48.63%. In this case there are some students who have difficulty in understanding the information provided. On the indicator 5, students achieved an average 44.56%. In this case, the student does not understand the information provided to the right. In indicator 6, students attain an average capability 42.14%.

3.5. Implementation of learning at SMPN 35 Medan.
Implementation of the learning process in SMPN 35 Medan which lasted one-way, active teachers, while students as learners is less activated. It can be seen from the behavior of students in the classroomdid not respond to questions of teachers, students simply copy the examples are given by

teachers and students after the completion of copying exercises silent not because they look confused when given math problems.

The ability of mathematical process standards tested at this school is about the ability of mathematical representations. Of 3 tested mathematical representations about kepda 36 junior high students with a maximum score of 12, the results show that there dk students who achieve perfect level and 76.82% of students are less able to resolve the issue offered teachers. [8] Mathematical representation abilities of students in U.S are very dependent on the teaching method given by the teacher. This suggests that the ability of students' mathematical representation needs to be enhanced through research work.

4. Conclusion

4.1. Learning mathematics which took place in junior high school field in general use classical learning or hands-on learning theories which share the stage giving, giving the problem, giving exercises and math problems done at home.

4.2. Teachers plan learning programs in schools-sekoah made uniformly even if the implementation is done in classical centered teacher.

4.3. The ability of students of SMPN Medan, standard mathematical process includes, reasoning, connection, communication and problem solving capabilities include refresentasi still find a lot of problems in working on solving the teacher.

4.4. The ability of the students of standard mathematical process of SMPN Medan, because of lack sufficient predicate, it is necessary dikakukan research to improve student math skills.

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