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Abstract. These research aims were described teacher's stimulus in mathematics learning for developing thinking the skill of Junior High School students grade VIII, and perceived teacher's perception about a scientific approach and thinking of Junior High School students grade VIII. This descriptive-qualitative research involved professional working group for mathematics that is the Association of Mathematics Teacher (Musyawarah Guru Mata Pelajaran, MGMP) in Semarang. The first step of the research was forum group discussion with 19 mathematics teachers grades VIII in Association of Mathematics Teacher Semarang. The second step was research in SMPN 23 Semarang and SMPN 36 Semarang. Data collection techniques include a questionnaire about teacher's stimulus for facilitating student's thinking; a questionnaire about students response based on teacher's stimulus; a survey about teacher's perception in a scientific approach, thinking, and 2013 Curriculum in the field; and observation sheet about teacher's stimulus for facilitating student's thinking. Method and sources triangulation used in this research. The result were teachers already have a good understanding about a scientific approach, and this research recommends problem posing, numerical investigation, and open-ended task as teacher stimulus in developing students' thinking ability in mathematics learning in Junior High School.

1. Introduction

The result of TIMSS 2011 in mathematics field of the 8th-grade students in Indonesia was: 43% of the students showed low ability, 15% of the students showed medium ability, only 2% of the students showed high skill, and 0% of the students showed advanced ability [1]. It shows that the students grade VIII of Junior High School in Indonesia are only able to solve problems that rely on basic mathematics knowledge, but they are weak in mathematical thinking ability that requires analytical, synthesis, and creative thinking. Therefore, mathematics learning in the schools must facilitate the students developing their thinking ability. The government responded this fact by issuing Act of Ministry of Education and Culture Number 58, 2014 which stated that the purpose of mathematics learning is to use reasoning in nature, manipulating mathematics both in simplification and analyzing existing components in problem-solving in the context of mathematics and outside of mathematics [2]. Thus, mathematics learning facilitates students' reasoning and thinking.

In the Act of Ministry of Education and Culture Number Number 103, 2014 stated that in learning any subject is conducted by a scientific approach (observing, questioning, collecting information, reasoning, and communicating) [3]. This experimental approach is raised by students so that they are trained to think from the simple to complex. In the questioning activity, the students are accustomed to thinking not only to ask about things that they have not understood but also express opinions, argue,

criticize the observed results. Fact, the students tend not to want to ask questions, do not have questions to ask, or they are ashamed to beg. Based on several observations of the learning implementation of mathematics necessary competencies in junior high school as well as the recognition of some junior high school mathematics teachers, the activity of students who rarely or even does not appear is the activity of "questioning." Likewise, the teacher stimulus that allows or demand the students' responses to ”questioning" action also does not appear. The teachers are not used to stimuli with the consequences of questioning response from students even though the questioning is a form of thinking activity that can be raised by the students.

The traditional approaches for teaching mathematics in the secondary classroom, the mathematics teacher defines the rules, demonstrates the procedures, and provides students with practice exercises [4]. The teacher shows to the students how to solve a complex problem and then the students solving similar issues [5]. Thus activities as a teacher-centered view of teaching mathematics. The changing teaching in mathematics was not straightforward [6]. One of them is a change in the teaching style of mathematics teachers. Teachers not only transfer their knowledge to the students but also facilitate the students with activities to construct their knowledge. Teachers role as facilitator gives students many opportunities to explore new knowledge [7]. The teachers must select and facilitate high-level task so that the students can make a connection between mathematical ideas or concepts, making conjectures, testing, justifying their reasoning, and solving nonroutine problems [8]. Many research about teachers facilitating role, i.e., teachers facilitating students to generalize and justify their mathematical reasoning [9], teachers use technological system that is the Argunaut system to guide students in synchronous discussions [10], teachers support students' in collective argumentation by direct contribution to arguments, asking question, provide information for the evidence, repeat something has been stated, and evaluate the correctness of mathematics) [11], and teachers support students participation promote students achievement in mathematics [12].

Students cannot develop their thinking ability without the teacher’s encouragement. According to Megan et al., the teacher must have a depth understanding of students' mathematical thinking so that they can encourage the development of students' mathematical competencies [13]. Thus, the teacher can develop the learning that suitable with abilities and thinking processes of students. The teacher plans the appropriate stimulus to develop students' thinking. Kristin et al. stated that mathematics teacher must provide stimulus to students, including modeling hard thinking, explaining and clarifying the mental processes used in problem-solving [14].

The teacher must be able to provide stimuli to the students so that they are accustomed to observing, questioning, collecting information, reasoning, and communicating so that the students can develop their thinking ability. Thus, the teacher must have sufficient knowledge about students' mathematical thinking and can apply how to use their expertise to develop students' mathematical thinking ability. The teacher gives students a thought stimulus in the form of the learning experience, and the response of students is to acquire knowledge. For examples use dialogue about the philosophical question [15], Socratic questioning as a stimulus for critical thinking [16], the teacher involves students in non-routine problem solving activities [17], and using youtube video as a stimulus for problem posing activity so that students can increase their level of thinking [18].

The ability of the teacher to identify the aspects of students' mathematical thinking is an essential thing in teaching understanding. According to Ceneida et al., the development of the teacher ability to interpret students' thinking, requires the teacher to make appropriate instructional decisions, such as selecting and designing tasks in problem-solving activities [19]. The teacher needs to know how students understand mathematical concepts to help the students improve their accurate understanding. The facts from the teacher side, the teachers, are less creative in providing stimuli to the students to do thinking and questioning activities. The questions that commonly used by the teachers to encourage students to ask questions such as "Is there anybody want to ask?", "try to make questions for this material." Consequently, the students' ability to ask questions is weak. The impact is their thinking ability less too.

This study aims to describe the form or type of the teacher stimulus in mathematics learning in the development of students' thinking ability at the basic education level that occurs in the field; knowing the teachers perception of the activity of the scientific approach (observing, questioning, collecting information/ experimenting, reasoning, and communicating) and the students' thinking concepts; and formulate the form of teacher stimulus in developing students' thinking ability in mathematics learning in Junior High School.

2. Methods

This study is descriptive-qualitative research. There are two main phases in this study, that is group discussion activities with mathematics teachers of Junior High School grade VIII who is a member of Association of Mathematics Teacher **(**Musyawarah Guru Mata Pelajaran, MGMP) Semarang City and field research in two public junior high schools in Semarang, that is SMPN 23 Semarang and SMPN 36 Semarang. The data sources of this study are a mathematics teacher grade VIII of Junior High School and the students grade VIII at SMPN 23 Semarang and SMPN 36 Semarang academic year 2018/2019. The first phase of this study is to obtain the data about the form or type of teacher stimulus in mathematics learning in developing students thinking ability in basic education that occur in the field and the teacher perception of the activities of the scientific approach and students' thinking concepts. The second phase of this study is in the form of observing the implementation of mathematics learning of grade VIII by applying the 2013 curriculum and scientific approach. This phase aims to obtain the data about the form or type of teacher stimulus in mathematics learning in developing Junior High School students' thinking ability that occur in the field.

Qualitative data in this study is the description of the form or type of teacher stimulus in mathematics learning in the development of students' thinking ability at the basic education level that occurs in the field; the description of the teacher perception of the scientific approach activity and the students' thinking concepts; and the description of the form formulation of the teacher stimulus in developing students' thinking ability in mathematics learning at the basic education level. The instrument in this study is the questionnaire of form or type teacher stimulus in developing thinking; the questionnaire of teacher perception on scientific approach, thinking, and learning based on the 2013 curriculum and scientific approach; and the observation sheet of the form or type of teacher stimulus in developing students' thinking that occurs in the field.

Triangulation in this study is technical triangulation, that is the data from the questionnaire form or type of teacher stimulus in developing thinking (teacher's knowledge of thinking according to Bloom's Taxonomy and type of stimulus ever given by the teacher) are triangulated with data from the observation sheet of form or type of teachers' stimulus in developing students' thinking that occur in the field. Technical triangulation is also conducted to obtain the description of teachers' perceptions about the scientific approach, thinking, and 2013 curriculum-based learning and scientific approach. In this study, the data from the teacher's perception questionnaire about the scientific approach, thinking, and 2013 curriculum-based learning and the scientific approach are triangulated with the data from the observation sheet about the form or type of teacher's stimulus in developing students' thinking that occurs in the field.

3. Result and Discussion

3.1. Description of The Form or Type of Teacher Stimulus in Mathematics Learning in The Development of Students' Thinking Ability at The Basic Education Level that Occurs in the Field

The group discussion activity with mathematics teacher of Junior High School grade VIII who is a member of Association of Mathematics Teacher (*Musyawarah Guru Mata Pelajaran, MGMP*) Semarang City was held on Saturday, May 5, 2018 at the mathematics laboratory of the Mathematics Department, Faculty of Mathematics and Natural Sciences, Universitas Negeri Semarang. In this activity, the teacher is given the questionnaire about the form or type of teacher stimulus in developing thinking (the teacher's knowledge of thinking according to Bloom's Taxonomy and the type of stimulus the teacher has given). The questionnaire explores the information about the types of stimulus

that given by the teacher and explores the thinking aspects of the students' based on Bloom's Taxonomy (knowledge, understanding, application, analysis, evaluation, and creation) facilitated by the teacher.

In discussion group forum activities, the teacher is also provided with the material about the types of thinking stimulus that can be given, that is problem posing, mathematical investigations, mathematics games, the use of mathematics teaching aids, and the use of technology in mathematics learning (plickers). The teacher also practices developing mathematics test using plickers.

The second phase of the study activity is field research at the grade VIII of SMPN 23 Semarang and SMPN 36 Semarang. In each school, the observation of the learning is conducted in one grade VIII studying mathematics by one teacher. Each teacher has observed the learning practice for three meetings. In the research activity in the schools, the observation form or type of the teacher stimulus is used in developing students' thinking that occurs in the field.

Based on the questionnaire about the form or type of the teacher stimulus in the development of thinking, obtained the data that the stimulus given by the teacher is as follows.

Table 1. Teacher stimulus facilitates the students' thinking

Questionnaire	Field research
Open-ended task develops the low-level thinking	**the open-ended task** for low-level thinking
Problem posing task develops low-level thinking	
Submitting a question that guides concept discovery and the challenging questions	**Submission of a guiding question** in the form of the worksheet for low-level thinking (finding the concept of parallel lines, finding the nth pattern of object configuration, finding the understanding and how to present the concept of relations and functions).
The use of technology by the students in the learning (powerpoint, video, YouTube, Geogebra, Cabri, etc.) to develop low-level thinking. The example stated by the teacher is using powerpoint, GeoGebra, video	
Facilitation of technology in learning. The example stated by the teacher, the teacher asks students to make line, bar, and circle diagrams using excel; using a laptop, LCD, active speaker, and internet network; discussion of problem-solving through class WhatsApp group	**Technology facilitation**(GeoGebra, powerpoint, video) by the teacher
Discovery of concepts with existing manipulative props/ make their props using second-hand items	**Utilizing the objects in the class**(scout sticks, brooms) to demonstrate the mathematical concepts (position of line to line)

Based on Table 1, the form or type of the teacher stimulus in mathematics learning in the development of students' thinking ability is an open-ended task, submission of the guiding question, technology facilitation, and utilizing the objects in the class. Based on Table 1, it is known that the thinking stimulus given by the teacher in the field research is not as much as the thinking stimulus written by the teacher in the group discussion forum. The teacher has provided the open-ended task but is still used to develop low-level thinking. The form of the open-ended task is to ask students to determine the points on the Cartesian Coordinate to make a line parallel to the X-axis or the Y-axis. This shows that students are given assignments that are only given the concept of points to produce other points. This fact is supported by the previous research that mathematical tasks that only ask for a particular procedure and remember are tasks with low-level cognitive processes even though the open-ended assignment is very appropriate to facilitate high-level thinking [20].

The teacher has also facilitated the thinking by submitting the guiding question in the form of the worksheet. But, the worksheet developed by the teacher are still simple, has not been able to explore a

variety of students' thinking activities, especially for high-level thinking (analysis to creation). It has the impact of the results in Table 3 that shows the thinking aspects of analysis on the low creation. The stimulus in the form of submitting questions by the teacher in practice is only to guide the students to find the concept. The teacher has not developed challenging questions for the students to have high-level thinking. This fact is not suitable for the teacher's answer during the group discussion forum, which states that the teacher often uses challenging questions to students' thinking. There are 3 types of questions, namely factual questions, guiding questions, and probing questions [21]. The question that the teacher did in this study is a guiding question to help students understand the concepts learned. Teachers did not ask the probing question at all that is question ask for elaboration, explanation, or justification. Mary et al. said that the teacher who asked the probing question would make the student able to explain his thinking [22]. Teachers rarely ask probing questions. Previous researches found that only 25% of student teachers asking a probing question [21] and teachers asking probing question 17% until 42% and teachers tend to ask the factual question [23]. Even though probing questions can encourage students to explain mathematical ideas because these questions ask students to explain and articulate ideas [24], probing questions encourage higher mathematical achievement [25], and the quality of teachers' probing questions affected students' achievement [26].

Stimulus in the form of technology facilitation means that the teacher asks students to be able to utilize any technology in the learning. During the group discussion forum, the teacher describes an example of a form of technology facilitation in the learning. But in practice, a teacher who practices using technology (at SMPN 23 Semarang using GeoGebra), while the students are not whereas the use of appropriate technology in mathematics learning is carried out by teachers and students. The use of technology does not mean teaching students about computers but encourages learning to teach mathematics using computers so that technological tools encourage their mathematical thinking [27].

The use of GeoGebra in learning at the school (SMPN 23 Semarang) is still simple. The use of this technology does not play an important role in learning. This fact is supported by previous research, which stated that technology plays a marginal role in the study of mathematics learning [28]. Students do not practice using GeoGebra. Whereas, when students practice using technology, they will be motivated to learn. Thus, the technology stimulates students' motivation to explore information acts as a learning resource in the class, completing the textbooks, and can be used to explore diverse problem situations [29,30]. Arbain N and Shukor stated that the use of GeoGebra in mathematics learning has a positive impact on student achievement and perceptions [31].

Questionnaire form or type of the teacher stimulus in the thinking development has sixty questions to determine the activity of the teacher in stimulating thinking of the aspects of knowledge, understanding, application, analysis, evaluation, and creation (Bloom Taxonomy). Eight indicators of eleven indicators of teacher's performance in facilitating the thinking of the knowledge aspect are in the high category, while three indicators others are in the medium category. Ten of the thirteen thinking indicators of understanding aspect are in the high category, while three indicators others are in the medium category. Five of the seven thinking indicators of the application aspect are in the high category, and two indicators others are in the medium category. Only one of the six thinking indicators of the aspect of the analysis is in the high category, while five indicators others are in the medium category. Four of the eight thinking indicators of the evaluation aspect are in the high category, while four indicators others are in the medium category. Two of the six thinking indicators of the creation aspect are in the high category, three indicators are in the medium category, and one indicator other is in a low category. Table 2 below illustrates the teacher's activities facilitating students' thinking based on Bloom's Taxonomy.

Table 2. Teacher activities in facilitating the development of students' thinking based on questionnaire

Thinking aspect	Category	Indicators
Knowledge: **Activity to ask the students**	High	**mention** the concepts that have been studied or are being studied **identify** the characteristics of the mathematical concept **drawing** according to the concept learned **list** **show** an example and not an example of a concept **name it** **read** **record** the material
Understanding: **activity to ask the students**	High	**explain** the relationship between concepts in mathematics **categorize** something in a mathematical concept **compare** the characteristics of several related mathematical concepts **calculate** in solving problems **change** the word problems into mathematical form and change the mathematical form into word problems **distinguish** the concept from another concept that is related give an **example** of a concept **discuss** to find the concepts **explain** the concept **express** the relationship between the concepts
Application: **activity to ask the students**	High	**apply** the concept to solving routine problems **determine** the solution of the problem **assign** the students to apply the concept in completing the task **calculate** in solving the problem of the concept application **demonstrate** something to find the concept **analyze** the tasks to find the concepts or **solve** non-routine problems **make a diagram** of the relationship of one mathematical concept with another mathematical concept
Analysi**s:** **activity to ask the students**	Medium	**make the detailed of** the steps of problem-solving into several parts **test** existing formulas or theorems or solve the problems **assess** the logic of the work or the friends' work **compare** conclude based on the calculation in solving contextual problems **predict** based on existing patterns **combine** the mathematical concepts in solving non-routine problems
Evaluation: **activity to ask the students**	Tend to be high	**develop** the tasks instructed by the teacher **create the** steps to solve or solutions of the problems in an unusual way
Creation: **activity to ask the students**	Medium	

Table 3. Teacher activity in facilitating the development of students' thinking based on field research

Thinking aspect	Category	Indicators
Knowledge: **Activity to ask the students**	High	**mention** the concepts that have been studied or are being studied **identify** the characteristics of the mathematical concept **drawing** according to the concept learned **list** **show** an example and not an example of a concept **name it** **record** the material **memorize** the understanding of mathematical concepts and characteristics of mathematical concepts **repeat**
Understanding: **activity to ask the students**	Low	**explain** the relationship between concepts in mathematics **categorize** something in a mathematical concept **compare** the characteristics of several related mathematical concepts **calculate** in solving problems **change** the word problems into mathematical form and change the mathematical form into word problems **distinguish** the concept from another concept that is related give an **example** of a concept **discuss** to find the concepts **explain** the concept **express** the relationship between the concepts **make** the pattern
Application: **activity to ask the students**	Medium	**apply** the concept to solving routine problems **determine** the solution of the problem **assign** the students to apply the concept in completing the task **modify** the problem and solve it **calculate** in solving the problem of the concept application **demonstrate** something to find the concept **analyze** the task to find the concept **correlate** one concept to another concept
Analysis: **activity to ask the students**	Low	**make the detailed of** the steps of problem-solving into several parts **conclude** based on the calculation in solving contextual problems **predict** based on existing patterns **abstracting** the contextual problems in the mathematical form
Evaluation: **activity to ask the students**	Low	
Creation: **activity to ask the students**	Low	

Based on the results of the questionnaire, it is known that the thinking aspects of knowledge, understanding, and applications are in the high category. It means that teacher often stimulates students' thinking in mathematics learning for this aspect. However, based on the results of research in the field, obtained the fact that the thinking of the understanding aspect is low, and the thinking of the application aspect is medium. This fact shows that the teacher has not maximized in facilitating students to think about the aspects of understanding and application. Many teacher activities that ask

students to think about the aspects of understanding and application that cannot be raised in the field research. The teacher gives many direct explanations with lectures to the students about the material studied. Student understanding is explored and developed with various stimuli from the teacher. One of them with an explanation from the teacher. However, the teacher's explanation in learning is not enough to encourage students to construct their learning to be meaningful [32]. Teacher explanation in learning, accompanied by quality design and implementation, will effectively encourage students to learn meaningfully. For example, the teacher's explanation of representation, examples, the analogy of the knowledge students have; utilization of knowledge and skills that students already have; full explanation and connected well; and explanation of mathematical errors provide opportunities for students to learn [33]. However, instructional explanations reduce the behavior of students constructing their knowledge [34]. Also, the professionalism of teachers in terms of their ability to provide explanations influences the quality and effectiveness of learning [35].

Based on the results of the questionnaire, it is known that the thinking of aspects of analysis, evaluation, and creation in the medium until tend to high category. However, based on research in the field, these three aspects of thinking are in a low category. It is caused during the observation, the mathematics material taught by the teacher is still the introduction of the concept including the introduction of the concept of a configuration of objects in the material of number patterns; line in the Cartesian plane; the understanding and way of expressing relations. In learning in the class, the teacher focuses on understanding students on these concepts. Based on Table 1 above, teacher stimulus during the research in the field is not diverse and still simple. There is no high- level thinking activity, and there is no non-routine math problem for students to do. Thus, the three aspects of thinking that require high-level thinking of the students cannot be raised.

3.2. Description of the teacher perception of the scientific approach, thinking, and 2013 curriculum-based learning and scientific approach

Based on the contents of the teacher perception questionnaire about the scientific approach, thinking, and 2013 curriculum-based learning and the scientific approach that occurs in the field obtained the fact that the teacher has already had a good understanding of the scientific approach. It can be known from the teacher's high response to each description of the scientific approach. The teacher knows that observing activity include observing natural phenomena, objects, etc. as an introduction of the explanation of a concept; reading book related to mathematicians; reading the history of a mathematical concept, and watching videos/shows related to the concepts learned. The teacher knows that the questioning activity includes asking to the teacher about things he has not understood about the material studied; asking the application of the mathematical concept in daily life; asking about the process of working the mathematical problem; asking based on the keywords that made by the teacher; and submitting the mathematical questions according to the concepts learned.

The teacher knows that the collecting information/ experimenting activity can be conducted by the experiment to answer the questions; reading the other learning resources to answer the questions; observing the existing objects to answer the questions, and discuss to answer questions.

The teacher knows that the reasoning activity is conducted by using the data obtained to answer the questions and think to answer the questions. The teacher knows that the communicating activity, including conveying the answers of the questions (conclusions) orally and conveying the answers of the questions (conclusions) in writing.

However, during the research in the field of the students class VIIIA of SMPN 36 Semarang and class VIIIC of SMPN 36 Semarang, it is known that the teacher facilitation in the scientific approach of the students is not yet varied for the activities of observing, questioning, and collecting information/ experimenting. For the observing activity, the teacher only asks the students to observe the information provided by the teacher in the worksheet. For the questioning activity, the teacher only asks, "Is there any question?". The teacher does not help the students to get used to questioning by giving guided questions then ask the students to raise other questions, not getting students to make questions based on the keywords given by the teacher. For the collecting information/ reasoning

activities, the students are only given the information that has been stated in the worksheet and do the discussions. They are not accustomed to collecting information from other learning sources or experimenting.

For the teacher, perception of students' thinking obtained the fact that the students can develop low-level thinking (knowledge, understanding, and application) during learning and assessment. However, for higher thinking ability, the students still have not maximally developed it in the teaching or applied it in solving mathematical problems. This fact can be caused by the lack of teacher facilitation to develop high-level thinking of the students.

For the teacher perception of the implementation of mathematics learning based on the 2013 curriculum and the implementation of a scientific approach, it is known that the teacher carries out the learning by prioritizing the aspects of students' mathematical knowledge rather than skills. Also, the teacher has facilitated the learning with the scientific approach but is still less in facilitating students' reasoning activity. The learning model expected to appear in the 2013 Curriculum has not been implemented maximally by the teachers in the schools. For mathematics, learning has been carried out coherently and suitable with the competencies to achieve (knowledge). The 2013 curriculum also emphasizes character education. Teachers in schools have facilitated the learning to develop the attitudes and characters of the students.

In the implementation of learning in the class, the teacher has not been maximized in using various learning resources. It has the impact of the lack of maximum involvement of the students in the use of learning resources. According to the 2013 Curriculum mandate, the contextual problems are used in learning in the class. However, the fact is the teachers are still unfamiliar.

Teacher learning that prioritizes the attainment of knowledge competencies has an impact on the lack of assessment implementation. It can be known from the questionnaire data above that the assessment is not always given at the end of the meeting. Assessments conducted by the teachers prioritize the aspects of knowledge and understanding that suitable with Bloom's Taxonomy. Teachers are not accustomed to developing the test to assess the students' ability of high-level thinking (analysis and evaluation of Bloom's Taxonomy). The assessment also prioritizes students' knowledge rather than assess the attitudes and skills of the students.

3.3. Formulation of the form of teacher stimulus in developing students' thinking ability in junior high school mathematics learning

The results show that the students' questioning ability has not been honed. To get the students to be able to ask questions properly, it is recommended that the stimulus is problem posing. The problem posing is an activity to create a new problem and reformulate the existing problems [36]. Zahra et al. stated that problem posing situations emphasized on the thinking about the relationship between mathematical ideas, and the results can stimulate high-level thinking and learners' divergent thinking aimed at higher education as a result of learning mathematics [37]. This situation provides the opportunity to involve the students in the hierarchical nature of the knowledge at a higher level, including analysis, evaluation, and creation [38], which encourages high-level thinking among learners.

Facts at the school also show that the teacher has used the guided question submissions in the worksheets that are still simple and measure low-level thinking. This study recommends the development of the task of mathematical investigation to apply the concepts obtained and explore the students' high-level thinking. Mathematical investigation helps the students to get a deeper knowledge of the concept. This is suitable with the statement [39] that stated that mathematical investigation is the learning activity to explore mathematical topics in depth and make connections between different representations. The results of the previous study show that mathematical investigations enhance mathematical reasoning ability because mathematical investigations emphasize the process of finding solutions to the problems [39].

Facts at the school indicate that the teacher has given the open-ended task to facilitate low-level thinking. This study recommends the open-ended assignments developed to facilitate high-level

thinking. Teachers are accustomed to developing the good open-ended assignments so that high-level thinking of the students can be developed.

4. Conclusion

Based on the result, obtained the conclusions as follows (1) the form or type of the teacher stimulus in mathematics learning in the development of students' thinking ability are open-ended task, submission of guided question, technology facilitation, and utilizing the objects in the class; (2) Theoretically, the teacher's already had a good understanding of a scientific approach. But research in the field shows that the teacher facilitation in the scientific approach of the students is not yet varied for the activities of observing, questioning, and collecting information/ experimenting. The students were able to develop low-level thinking (knowledge, understanding, and application) during learning and assessment. However, for higher thinking ability, the students still have not maximally developed it in the learning or applied it in solving mathematical problems; (3) This research recommends problem posing, mathematical investigation, and open-ended task as teacher stimulus in developing students' thinking ability in mathematics learning in Junior High School.

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