MATH TEACHER QUESTIONS CAN HELP STUDENTS AROUND COFFEE PLANTATIONS TO BEHAVE CRITICAL THINKING

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Abstract

The questions asked by the teacher affect students' thinking processes. So, it is necessary to do research that aims to describe what types of questions can provoke students to behave critically. The research subjects were 40 junior high school students around a coffee plantation in Jember, Indonesia. The data collection methods in this study were (1) test, (2) observation, and (3) interview. Each test was given two questions that meet the criteria for critical thinking behavior with the theme of coffee. The test is given at the end of mathematics lessons every Monday. Observations focused on three critical thinking behaviors, namely truth-seeking, open-mindedness, and inquisitiveness. Interviews were conducted at the end of the activity, namely after five learning meetings. There are two findings in this research. First, junior high school students around coffee plantations are accustomed to truth-seeking, open-mindedness, and inquisitiveness in responding to questions from teachers. The habit of students in responding to teacher questions begins at the third meeting in learning. Second, there are three types of questions that can provoke students to behave critically. The three types of questions are questions that require students to construct concepts, principles, and procedures.

Keywords: Critical thinking disposition; mathematics; theme of coffee

Abstrak

Soal-soal yang diberikan oleh guru selama pembelajaran di kelas mempengaruhi proses berpikir siswa. Sehingga perlu dilakukan penelitian yang bertujuan untuk mendeskripsikan jenis pertanyaan apa yang dapat menstimulus siswa untuk berperilaku kritis. Subjek penelitian adalah 40 siswa SMP di sekitar perkebunan kopi di Jember, Indonesia. Metode pengumpulan data pada penelitian ini adalah (1) metode tes, (2) metode observasi, dan (3) metode wawancara. Setiap tes diberikan dua soal yang memenuhi kriteria perilaku berpikir kritis dengan tema kopi. Soal yang diajukan merupakan soal yang menitikberatkan pada konstruksi konsep, prinsip, dan prosedur dalam matematika. Tes diberikan pada akhir pelajaran matematika setiap hari Senin. Pengamatan difokuskan pada tiga perilaku berpikir kritis, yaitu pencarian kebenaran, keterbukaan pikiran, dan rasa ingin tahu. Wawancara dilakukan pada akhir kegiatan yaitu setelah lima kali pertemuan pembelajaran. Ada dua temuan dalam penelitian ini. Pertama, siswa SMP di sekitar perkebunan kopi terbiasa mencari kebenaran, memiliki pemikiran terbuka, dan rasa ingih tahu dalam menjawab pertanyaan dari guru. Kebiasaan siswa dalam menanggapi pertanyaan guru dimulai pada pertemuan ketiga dalam pembelajaran. Kedua, ada tiga macam soal yang dapat menstimulus siswa untuk berperilaku kritis. Ketiga jenis soal tersebut merupakan soal yang menuntut siswa untuk menyusun konsep, prinsip, dan prosedur.

***Kata kunci**: Disposisi Berpikir Kritis; matematika, tema kopi*

INTRODUCTION

Indonesia is an agrarian country with most of the population working in agriculture and plantations. Therefore, one of the environments in Indonesia is the coffee plantation environment, where Indonesia is the fourth largest coffee producing country in the world after Brazil, Vietnam, and Colombia. (Atmadji & Suhardiman, 2018). East Java is the largest province in Indonesia that produces coffee (Aswicahyono & Rafitrandi, 2018). One of the regencies in East Java province where most of the area is coffee plantations is Jember. Based on these conditions, mathematics learning in schools, especially in Jember, Indonesia, must adapt to the conditions of the students' closest environment, namely the coffee theme. This is in accordance with Maslow's theory which states that students can take advantage of their immediate environment for a meaningful learning process within themselves (Uysal, Aydemir, & Genc, 2017; Kaur, 2013).

But in fact, the learning carried out in junior high schools in the Jember coffee plantation area has not been integrated with problems with the coffee theme (Kurniati & zayyadi, 2018). As a result, students around Jember coffee plantations have not behaved critically (Kurniati & zayyadi, 2018). Even though, one of the goals of learning mathematics in Indonesia in the 21st century is to familiarize students with critical thinking in responding to everyday problems (Partnership for 21st Century Skills, 2017; Peraturan Menteri Pendidikan dan Kebudayaan Republik Indonesia, 2018). Therefore, it is necessary to make efforts to familiarize students around coffee plantations to behave critically. One of these efforts is to familiarize students with solving problems related to their environment. Thus, giving questions that can continuously motivate students to get used to behaving critically.

Questions given by the teacher play an important role in shaping interactions between students (Akkus & Hand, 2010; Funahashi & Hino, 2014). The questions provided help students make connections between prior knowledge and new mathematical content (Koizumi, 2013), understand problems (Warner, Schorr, Arias, Sanchez, 2013), and develop mathematical reasoning (Moyes & Milewicz, 2002). However, the questions often used by teachers are factual questions rather than critical questions and teachers have difficulty in asking productive questions that focus on concept construction (As 'ari, Mahmudi, & Nuerlaelah, 2017). Teachers often ask questions with yes or no answers rather than questions that require higher order thinking, especially critical thinking (Weiland, Hudson, & Amador, 2014). Therefore, mathematics teachers need to design questions that provoke students' critical thinking behavior. The design of these questions must be adapted to the conditions of the student's environment, so that students can apply the experiences experienced when solving questions asked by the teacher. In this study, the questions asked by the teacher were mathematical questions related to the coffee theme.

Critical thinking behavior is the tendency to act logically and rationally to decide what to do or believe (Ennis, 2011; Facione, Sanchez, Facione, & Gainen, 1995). The components of critical thinking behavior are truth-seeking, open-mindedness, analyticity, systematicity, self-confidence, inquisitiveness, and maturity. Based on the results of previous studies, critical

thinking behaviors that have not developed in students around Jember coffee plantations are truth-seeking, open-mindedness, and inquisitiveness (Kurniati & Zayyadi, 2018). Truth-seeking is a habit that focuses on behavior to seek the truth, ask questions by asking questions, and the drive to find answers. Open-mindedness is a person's tendency to accept other people's opinions even though they have different views. Inquisitiveness is intellectual curiosity. Tendency to want to know a lot of things, even if not immediately or not useful at the moment. Therefore, the focus of this research is the submission of mathematical questions that familiarize students around coffee plantations with critical thinking behavior, especially the habituation of students to truth-seeking, open-mindedness, and inquisitiveness.

Based on the explanation above, there are two objectives of this research activity. First, describe the behavior of truth-seeking, open-mindedness, and inquisitiveness of junior high school students in responding to math questions with the theme of coffee. Second, determine what types of questions can help students around coffee plantations get used to behaving truth-seeking, open-mindedness, and inquisitiveness.

METHOD

This research was the descriptive qualitative research that describes the behavior of truth-seeking, open-mindedness, and inquisitiveness of junior high school students in responding to mathematical questions with the theme of coffee. In addition, this study also determines what types of questions can help students around coffee plantations get used to truth-

seeking, open-mindedness, and inquisitiveness behavior.

The subjects in this study were 40 junior high school students around the Ajung coffee plantation, Jember, East Java, Indonesia. Students who were selected as research subjects were students who had experience helping their parents in growing coffee, either as owners or laborers. The reason for choosing the subject is because in answering math questions the teacher asks is based on the students' experience in growing coffee.

There are three instruments used in this study, namely questions with the theme of coffee, critical thinking behavior observation sheets, and interview sheets. The instrument used has been validated by two experts in mathematics education and one mathematics teacher who teaches in junior high schools around coffee plantations. The results of the validation of the three experts are the instruments that have been compiled have met the valid criteria and are in accordance with the research objectives.

The data collection methods in this study were (1) the test method, (2) the observation method, and (3) the interview method. The test method was given in five learning meetings to 40 students. Each test is given two questions with the theme of coffee. The questions asked are questions that focus on the construction of concepts, principles, and procedures in mathematics. The test is given at the end of mathematics lessons every Monday. When students determine the answers to questions given by the teacher, direct and indirect observations are made, namely with a recording device. Observations focused on three critical thinking behaviors, namely truth-seeking, open-mindedness, and

inquisitiveness. The results of the two data collection methods will be analyzed to answer research questions. Interviews were conducted at the end of the activity, namely after five learning meetings. Interviews were conducted to eight research subjects. This is because the data obtained from the interview results are fixed or consistent. So, the interview was stopped when getting saturated data to answer the problem formulation of this study.

There are five stages of data analysis in this study. First, analyzing test results, direct observations, and interviews for 5 learning meetings. Second, reducing the data obtained from the first stage of data analysis. Reduction is done to remove data that is not related to the research objectives. Third, compile all data to determine the tendency of students' truth-seeking, open-mindedness, and inquisitiveness behavior in responding to teacher questions. Fourth, find the types of questions that can provoke junior high school students around coffee plantations to behave critically. Finally, draw conclusions to answer two research questions.

RESULTS AND DISCUSSIONS
1. Results
Truth-Seeking, Open-Mindedness, and Inquisitiveness Behaviors

During the giving of questions from the first meeting to the second meeting, 40 students were used to behaving inquisitiveness but had not behaved in truth-seeking and open-mindedness. Furthermore, at the third to fifth meeting, 28 students have behaved truth-seeking, open-mindedness, and inquisitiveness in responding to the mathematics teacher's questions. The rest 12 students still have not behaved truth-seeking and open-mindedness even though they have behaved inquisitiveness. The cause of the 12 students who have not behaved in truth-seeking and open-mindedness is that students have not been able to connect their experiences with the questions asked by the teacher. Even though they already have curiosity when trying to solve math problems given by the teacher. In general, the results of research related to the tendencies of truth-seeking, open-mindedness and inquisitiveness behavior of students around coffee plantations during five learning meetings can be seen in Table 1.

Table 1. Number of Students Who Behave Truth-Seeking, Open-Mindedness, and Inquisitiveness during Five Meetings

Meeting	Questions	The Number of Students		
		Truth-Seeking	Open-Mindedness	Inquisitiveness
I	In the process of planting coffee plants, we are asked to arrange rows of coffee plants with the condition that the rows formed are arithmetic sequences with an odd number of coffee plants in the first row and a difference between rows of 3 coffee plants. If the number of coffee plants in row 11 is 36 trees, find the number of coffee plants in row 12! Explain the meaning of the sequence of a number when it is associated with the model of planting coffee on plantation land?	0	0	40

Meeting	Questions	The Number of Students		
		Truth-Seeking	Open-Mindedness	Inquisitiveness
II	What is the angle of cutting the coffee tree trunk so that vegetative propagation can be carried out? Explain your reason. Determine the system of equations according to the conditions: (1) the number of coffee plants aged 6 months and 1 year to be planted is 120 stems, (2) the ratio of coffee plants aged 6 months and 1 year is 3:2. Next, determine the number of coffee plants aged 6 months and 1 year, respectively, according to the system of equations you have created. Find half the area of the coffee plantation in the form of a triangle whose sides are 4 m, 5 m and 10 m.	0	0	40
III	It is known that the ratio of Bima and Adi's money is 5: 4 and Adi's money is Rp. 70.000,00 more than Bima's money. How much money do they have? What is an even number? Give an example of implementing even numbers in your daily life related to the theme of coffee.			
IV	It is known that the area of land that can be planted with coffee is 824 m^2. Determine the number of coffee stems that can be planted on the land provided! A and B plan to exchange the money in their respective wallets. A gives all the money in his wallet to B on the condition that B gives 20% of the money in his wallet. Investigate which of them suffered losses?	28	28	40
V	During high school, Budi was trusted by his parents to manage Rp. 10,000,000,-. The gift from Budi's parents is only done once so that Budi is expected to be able to manage the money effectively and efficiently with the aim of making a profit. Can you help Budi manage the money his parents gave him so that both Budi's needs can be met?			

All research subjects have curiosity when trying to solve the given question in the first meeting. This is indicated by the subject's efforts to find answers about the row pattern of the coffee plant when it was initially planted. However, the curiosity of the research subjects was not continued for the next stage, namely the process of checking the truth of the information known in the questions given by having discussions with friends who have the same experience in growing coffee. The following is Figure 1. which is an example of the response given by the research subject in answering the questions given by the teacher at the first meeting.
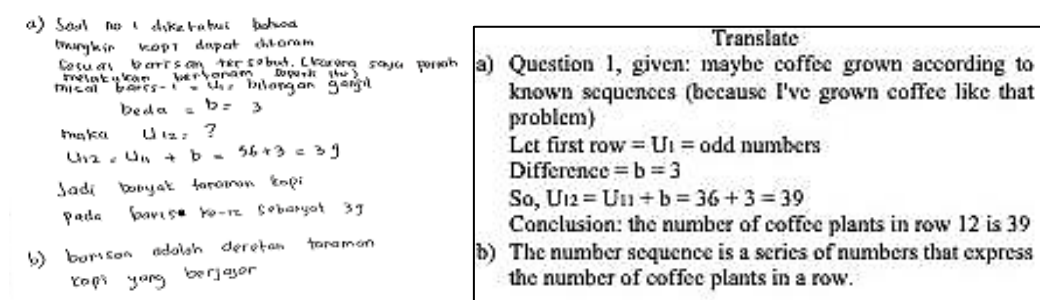
Figure 1. Examples of Responses Given by Research Subjects in Answering Questions at the First Meeting

Based on Figure 1, it can be seen that students did not check the correctness of the information given in the questions. Students directly determine the number of coffee plants in the 12th row without checking whether it is true that the number of coffees in the first row is an odd number. Students should check the correctness of the number of coffee plants in the first row through the number of coffee plants in the 11th row. If students check the truth, then students know that the number of coffee plants in the first row is not odd but even, namely 6. As for the second question, students do not ensure the universal set of the number sequence. The universal set in the second question affects the understanding of the number sequence that expresses the number of coffee plants planted. If the universal set is a positive integer, then the definition of the sequence presented by the students is correct. However, if the universal set is a negative integer, then the definition of the sequence of numbers that represents the number of coffee plants cannot be determined. Because, the amount of coffee is never negative. So that the universal set greatly affects the answer or response to the second question.

The behavioral tendency at the first meeting has similarities with the behavior that appears in the research subjects when responding to questions posed by the teacher, namely they have not behaved in truth-seeking and open-mindedness but have behaved inquisitively. The experience experienced by the research subjects at the first meeting was not used as a basis in the problem-solving process given by the teacher. Students are not suspicious of the information in the questions given.

Responses of research subjects to questions asked by teachers varied, but they still did not behave critically, especially truth-seeking and open-mindedness. The existence of differences of opinion to answer the first question, should be able to help students to accept differences of opinion as long as there are logical and rational reasons. Students assume that the answers to mathematical problems are always single, so there are differences of opinion that focus on the final result not on the reasons and the process of solving it. The following Figure 2 is an example of student answers that are different but equally correct in responding to the first question at the second meeting.
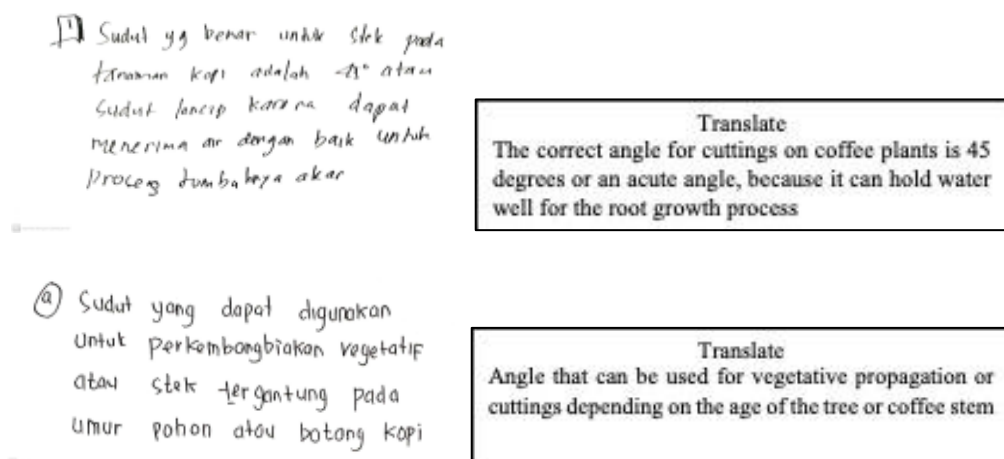
Figure 2. Examples of Responses Given by Research Subjects in Answering Questions at the Second Meeting

Referring to Figure 2., it can be seen that students have different opinions but have the same value because the reasons given are logical and rational. So that through giving these questions students should be able to think openly to accept different opinions. The behavior shown by students in responding to the first question was different from the response to the second question. The difference is that students do not check the truth whether it is possible that a comparison between coffee trees aged 6 months and 1 year can result in the sum of the two trees being 120. If students do a truth check, students will know that the results obtained are not integers but numbers. rational. It is not true that the number of tree trunks is a rational number.

At the third to fifth meeting, there was a change in the behavior of the students, especially the behavior of truth-seeking and open-mindedness. These changes were influenced by their experience in responding to questions at the first and second meetings. Students' suspicion of the information in the question affects students to check the truth of the questions. Thus, students are accustomed to truth-seeking behavior in responding to teacher questions. Students always ask, the reasons and clarity of the information in the questions to the teacher when asking questions. Students assume that there is a possibility that the information given in the problem is incorrect information or excessive information so that it does not need to be used in the completion process.

At the third to fifth meeting, 28 research subjects have behaved open-mindedness in responding to questions given by the teacher. Students begin to get used to accepting different opinions with logical and rational reasons and processes. Students are accustomed to assuming that there are many possible answers or solutions to mathematical questions. Students are accustomed to accepting open-ended math problems or questions. The openness of the solution depends on the universal set of variables in the problem. The difference in universal sets will affect the decisions taken by students in determining the final solution.

Inquisitiveness behavior is also a habit of high school students around coffee plantations in responding to math problems or questions posed by the teacher. At the third to fifth meetings,

students have curiosity from each question given which is shown by some effort and thought to check the truth of the questions either to the teacher or classmates. Students' curiosity is influenced because students have experience growing coffee but have not connected it to the mathematics material taught at school.

Examples of student answers who behave in truth-seeking, open-mindedness, and inquisitiveness in responding to the first question at the fourth meeting are shown in Figure 3. Meanwhile, examples of student answers in responding to the second question at the fourth meeting are shown in Figure 4.
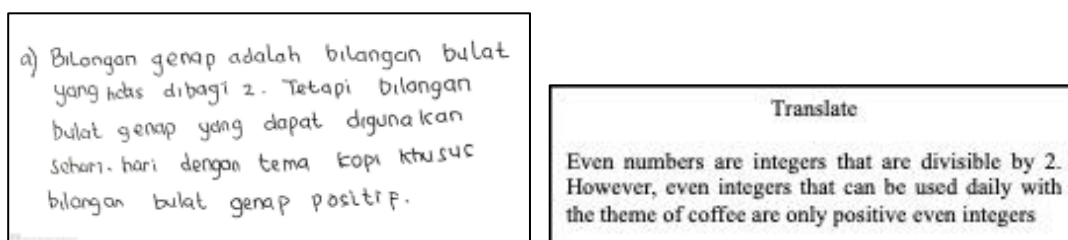

Figure 3. Examples of Responses Given by Research Subjects in Answering First Questions at the Fourth Meeting
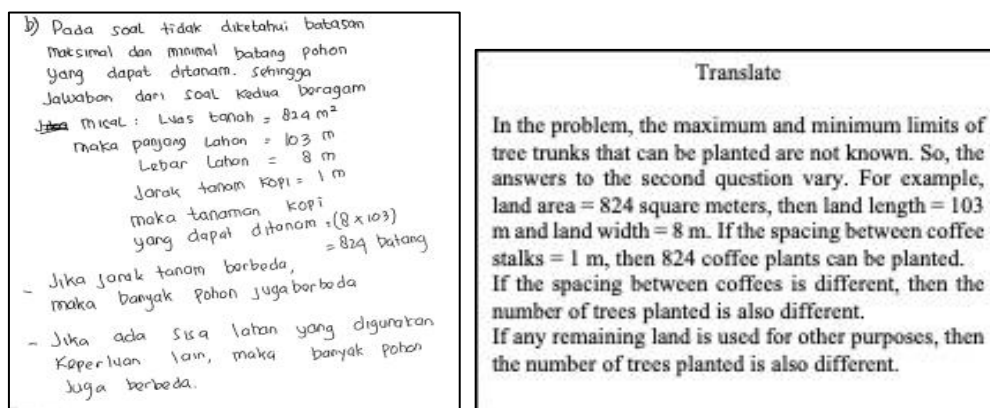

Figure 4. Examples of Responses Given by Research Subjects in Answering Second Questions at the Fourth Meeting

Based on Figure 3., students can relate their daily problems to math material. Students can decide that only positive even integers can be applied to the coffee theme problem. Because, the number or number of coffee trees is never negative. Moreover, to calculate harvest time, number of harvests etc., only positive integers are associated. Students' thinking in deciding the solution to the first question is also the same as the tendency that students convey when conveying logical and rational reasons for the second question as shown in Figure 4.

Students can determine all the possibilities based on the universal set. Therefore, students can make the right decisions in solving problems given by the teacher. In addition, students can determine strategies for problem solving solutions from various points of view of existing mathematical concepts, principles, and procedures.

Questions that Provoke Students' Critical Behavior

Based on the findings related to students' critical thinking behavior, especially truth-seeking, open-mindedness, and inquisitiveness in responding to questions posed by the teacher, the types of questions can be grouped into three groups. The first group, the type of questions that construct concepts. Concept construction in question are questions that require students to convey the definition of a number and provide examples of concepts in students' daily lives. definition of even numbers, integer sequences, and arithmetic series.

The second type of question is a question that requires students to choose an appropriate principle. Furthermore, the second type of question is focused on students being able to determine the right way or strategy in solving problems. Examples of the second type of question are questions that ask students to determine the solution to the problem by checking the correctness of the information in the problem, the possibility of various solutions depending on the universal set, and various answers from various concepts.

The third type of question is a type of question that requires students to prove the truth of a statement and theorem. In addition, questions that ask students to write down the problem-solving process coherently and explain all the logical reasons for each step of the solution. In this third type of question, students are asked to write down all known information, both true and false. Write down all universal sets and all possible answers.

2. Discussions

Based on the results of the study, there were two findings obtained in this study. First, junior high school students around coffee plantations are accustomed to truth-seeking, open-mindedness, and inquisitiveness in responding to questions from teachers. Second, there are three types of questions that can provoke students to behave critically, namely questions that require students to construct concepts, principles, and procedures.

The first finding of this study is that students are accustomed to truth-seeking and open-mindedness in answering questions since the third meeting, while inquisitiveness behavior is used to asking questions at the first meeting. This is in line with previous research which states that the truth-seeking and open-mindedness behavior of students around Jember coffee plantations can develop after being provoked or given a stimulus by the teacher (Kurniati & Zayyadi, 2018). But it is different from the results of other studies which state that students' inquisitiveness does not appear in themselves before there is motivation from the environment that demands curiosity in solving problems (Zetriuslita, Wahyudin, & Jarnawi, 2017). Basically, students' curiosity can develop in responding to problems related to their environment and previous experiences (Astuti, Waluya, & Soedjoko, 2020) because students can relate old concepts to new concepts. Therefore, mathematics teachers can increase students' curiosity by involving students in determining everyday math problems that are adapted to their environment.

The second finding of this study is that there are three types of questions that can provoke students to behave critically, namely those that require students to construct concepts, principles, and procedures. This is in line with other research which states

that reasoning questions that require students to develop concepts, procedures, and principles in mathematics are questions that can familiarize students with high-level thinking (Warner, Schorr, Arias, & Sanchez, 2013; Moyer & Milewicz, 2002; Weiland, Hudson, & Amador, 2014). The type of reasoning question in mathematics is a question that familiarizes students to prove a statement and think logically in making decisions about the appropriate solution (Simon, 2017) so that students are accustomed to behaving critically in solving types of reasoning questions.

Concepts, principles, and procedures are the main characteristics of mathematics, so every mathematical problem-solving activity always involves these three components (Ling, Osman, Daud, & Hussin, 2019). Likewise, when teachers design questions that can provoke students to behave critically, they must pay attention to questions that can construct concepts and implement principles and procedures (Funahashi & Hino, 2014; Anwar & Setyaningrum, 2021). Examples of questions that require students to construct concepts are questions that ask students to find the definition of a concept or ideas that can be used to classify a mathematical object (Warner, Schorr, Arias, & Sanchez, 2013; Simon, 2017). Furthermore, an example of a question that constructs and implements principles and procedures in the process of finding a solution is a question that requires students to prove the theorems and solving procedures in a coherent manner by writing down the logical reasons for each step (Renkl, 2017).

CONSLUSION AND SUGGESTION

There are two conclusions from this research. First, junior high school students around coffee plantations are accustomed to truth-seeking, open-mindedness, and inquisitiveness in responding to questions from teachers. The habit of students in responding to teacher questions begins at the third meeting in learning. At the first and second meetings, students were still not used to truth-seeking and open-mindedness. But the students' inquisitiveness behavior emerged from the first meeting.

Second, there are three types of questions that can provoke students to behave critically. The three types of questions are questions that require students to construct concepts, principles, and procedures. The first type, questions to define and classify an object. The second type is a question to determine the right way or strategy in solving the problem. The third type is a question that asks students to write in detail the process of completing the question and the conclusions drawn.

Suggestions for researchers who have a research focus on critical thinking behavior is to try out the types of math questions that have been found in studies of junior high school students in other areas, although not coffee plantation areas. The results of these trials can be used to familiarize students with critical thinking behavior in responding to mathematical problems. Another result is to be able to find out whether four other critical thinking behaviors can be habituated apart from those found in this study, namely truth-seeking, open-mindedness, and inquisitiveness.

DAFTAR PUSTAKA

Aizikovitsh-Udi, E., & Cheng, D. (2015). Developing Critical Thinking Skills from Dispositions to Abilities: Mathematics Education from Early Childhood to High School. *Creative Education*, *6*, 455–462.

Akkus, R. & Hand, B. (2010) Examining teachers' struggles as they attempt to implement dialogical interaction as part of promoting mathematical reasoning within their classrooms. *International Journal of Science and Mathematics Education*, *9*, 975-998.

Anwar, S., & Setyaningrum, W. (2021). Can Blended Learning Help Improve Students' Critical Thinking Skills. *Aksioma: Jurnal Program Studi Pendidikan Matematika*, *10*(2), 721-732.

As 'ari, A. R., Mahmudi, A., & Nuerlaelah, E. (2017). Our Prospective Mathematic Teachers are not Critical Thinkers Yet. *Journal on Mathematics Education*, *8*(2), 145–156. https://doi.org/10.22342/jme.8.2.3961.145-156.

Astuti, D. D., Waluya, B., & Soedjoko, E. (2020). Mathematical representation ability and curiosity of 8th graders in the 7E-Learning Cycle Model with realistic approaches. *Unnes Journal of Mathematics Education*, *9*(2), 116-120.

Aswicahyono, H., & Rafitrandi, D. (2018). *A Review of Indonesia's Economic Competitiveness*. Centre for Strategic and International Studies.

Atmadji, E., &Suhardiman, Y. H. (2018). Comparison analysis of imported coffee of Malaysia from Indonesia and Vietnam. *Economic Journal of Emerging Markets*, *10*(1), 93– 98.

Cottrell, S. (2005). *Critical Thinking Skills: Developing Effective Analysis and Argument.* New York, N.Y: Palgrave Macmillan.

Ennis, R. H. (2011). The nature of critical thinking: An outline of critical thinking dispositions and abilities. *University of Illinois*, *2*(4).

Facione, P. A. (1990). *Critical thinking: A statement of expert consensus for purposes of educational assessment and instruction—The Delphi report.* Millbrae, CA: California Academic Press.

Facione, P. A., & Facione, N. C. (1992). *The California Critical Thinking Disposition Inventory*. Millbrae, CA: California Academic Press.

Facione, P. A., Sanchez, C. A., Facione, N. C., & Gainen, J. (1995). The disposition toward critical thinking. *The Journal of General Education*, *44*(1), 1- 25.

Funahashi, Y., & Hino, K. (2014). The teacher's role in guiding children's mathematical ideas toward meeting lesson objectives. *ZDM Mathematics Education*, *46*, 423-436.

Kaur, A. (2013). Maslow's Need Hierarchy Theory: Applications and Criticism. *Global Journal of Management and Business Studies*, *3*(10), 1061-1064.

Kawanaka, T., & Stigler, J. W. (1999). Teachers' use of questions in

eighth-grade mathematics classrooms in Germany, Japan, and the United States. *Mathematical Thinking and Learning*, *1*(4), 255-278.

Koizumi, Y. (2013). Similarities and differences in teachers' questioning in German and Japanese mathematics classrooms. *ZDM Mathematics Education*, *45*, 47-49.

Kurniati, D., & Zayyadi, M. (2018). The Critical Thinking Dispositions Of Students Around Coffee Plantation Area In Solving Algebraic Problems. *International Journal of Engineering & Technology*, *7*(2.10), 18-20.

Ling, C. Y., Osman, S., Daud, M. F., & Hussin, W. N. W. (2019). Application of Vee Diagram as a Problem-Solving Strategy in Developing Students' Conceptual and Procedural Knowledge. *International Journal of Innovative Technology and Exploring Engineering (IJITEE)*, *8*(10), 2796–2800. doi:10.35940/ijitee.J9591.088101

Mason, J. (2000). Asking mathematical questions mathematically. *International journal of mathematical Education in Science and Technology*, *31*(1), 97-111.

Moyer, P. S. & Milewicz, E. (2002). Learning to question: categories of questioning used by preservice teachers during diagnostic mathematics interviews. *Journal of Mathematics Teacher Education*, *5*, 293-315.

Partnership for 21st Century Skills. (2017). *The 4Cs: Skills for Today Research Series*. Retrieved from http://www.p21.org/our-work/4cs-research-series.

Peraturan Menteri Pendidikan dan Kebudayaan Republik Indonesia Nomor 20 Tahun 2018 Tentang Penguatan Pendidikan Karakter Pada Satuan Pendidikan Formal. Retrieved from https://jdih.kemdikbud.go.id.

Renkl, A. (2017). Learning from worked-examples in mathematics: students relate procedures to principles. *ZDM Mathematics Education*, *49*, 571-584.

Simon, M. A. (2017). Explicating mathematical concept and mathematical conception as theoretical constructs for mathematics education research. *Educational Studies in Mathematics*, *94*, 117–137.

Uysal, H. T., Aydemir, S., &Genc, E. (2017). *Maslow's Hierarchy of Needs In 21st Century: The Examination of Vocational Differences* in book: Researches on Science and Art in 21st Century Turkey (pp.211-227). Gece Kitaplığı.

Warner, L. B., Schorr, R. Y., Arias, C. C., & Sanchez, L. (2013). A case study of two teachers: teacher questions and student explanations. In Lesh, R., et al. (Eds.), (pp.512-529). Springer.

Weiland, I. S., Hudson, R. A., & Amador, J. M. (2014). Preservice formative assessment interviews: The development of competent questioning. *International Journal of Science and Mathematics Education*, *12*(2), 329-352.

Zetriuslita, Wahyudin, & Jarnawi. (2017). Mathematical Critical Thinking and Curiosity Attitude in Problem Based Learning and Cognitive Conflict Strategy: A Study in Number Theory course. *International Education Studies*, *10*(7), 65-78.