

Descriptive study of the kinds of questions asked by novice teacher on mathematics learning process

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Abstract. This study described the kinds of a question asked by novice teacher on mathematics learning process of senior high school. The data were collected by passive participation observation and a semi-structured interview. The validity of data was obtained through the triangulation of method, triangulation of time and member check. The data analysis technique used in this study is descriptive analysis. The result of this study showed that at the preliminary activity, the question asked by the novice teacher based on objective only compliance question. At the main activity, the novice teacher asked compliance question, prompting question, probing question and sometimes rhetorical question. The kind of questions based on the cognitive dimension of Revised Bloom's Taxonomy that was asked by novice teacher only remembering question. At the main activity, the novice teacher asked the question of remember, understand, apply, analyse and evaluate. At the closing activity, the teacher does not ask the question based on objective and Revised Bloom's Taxonomy.

1. Introduction

Being a teacher is not enough with the skills of knowledge in their field, but also required to have teaching skills as a supporter. One of the skills that must be mastered is a questioning skill which is a stimulus for generating or cultivating student responses so that students' critical and creative thinking can develop. Just as Brown and Edmondson define, "Questions in the classroom are statements intended to obtain oral responses" [8]. In Wragg and Brown's (2001) study report that a teacher spends a lot of their time asking questions of one to two minutes [2]. Also, Critelli suggests that there are several variations of methods to increase student participation in the class, the most important method is by asking questions [4]. Therefore, Callahan and Clarke argue that the question is one of the most important of all teaching techniques [10]. The question is one sign of one's involvement in learning and critical thinking [12]. The quality of questions is reviewed from the different kinds of questions that teachers ask [3].

However, if observed, sometimes the teacher asked questions that are less stimulate the critical thinking process. Brickhouse said, "the level of experience can make a teacher to appreciate a science" [5]. Barizi argues that educational background and teaching experience are two aspects that affect the professionalism of a teacher in education and teaching [1]. The results of research conducted by McAnnich (2015) concluded that the novice teachers have less experience in teaching so that the skill in asking questions is not exactly right [7]. In this research, it appears that the less

experience in teaching causes the questions asked by teacher are less stimulating in critical thinking. Supported by Ong research (2010) that results from the novice teachers still ask routine questions which are focusing on procedures and final answers. The study showed that the content of the questions have less stimulus in critical thinking. Another results of Widodo's research (2006) conducted in four junior high schools in Bandung stated that most of the questions posed by novice teachers are close questions that require simple answers and the questions that require memorization and comprehension. It shows that the contents of the questions asked do not stimulate students' thinking. The contents of a question related to the kinds of question. The kinds of question are classified by their objective and Bloom's taxonomy [11]. However, so far the classification of the kinds of question used the kind of question based on the objective and kind of question based on Bloom's taxonomy. In 2001, Bloom's taxonomy changed from a noun to a verb (Revised Bloom's Taxonomy) made to better suit educational goals [6] Based on these explanation and the changes in the Bloom's Taxonomy, the authors conducted a study related to the kinds of questions asked by novice teachers in the mathematics learning process.

2. The Method of study

The study was conducted in SMA Taman Madya Probolinggo and SMA Taman Madya Kraksaan on Academic Year 2016/2017. The time on the first semester of 2016/2017 in September-December, 2016. The main subject consists of one novice mathematics teachers of SMA Taman Madya Probolinggo and one novice mathematics teachers of Taman Madya Kraksaan who have teaching experience under four years.

This study is a descriptive qualitative research which describes the kinds of questions that asked of novice mathematics teacher. The kinds of question consist of the question based on objective [11] and the question based on cognitive process dimension of Revised Bloom's Taxonomy [6]. The data were collected by passive participation observation and a semi-structured interview. The data analysis is an inductive analysis based on the data which is obtained, then developed into hypotheses. The fourth selected results of observations of each teacher will be triangulated. The triangulation results will be validated back to the interviews result then obtained the temporary results of research which will be member check to the related subjects to improve the validity of the data so that the conclusion in corresponding to the data source

3. Result and Discussion

Data of the kinds of questions will be presented one example of questions asked by teachers in one of the mathematics learning process of four selected observations. This data is described based on the learning process that is on the preliminary activity, main activities and closing activity.

Table 1. The data example of the kinds of question asked by novice teacher based on objective

Learning Process	Subject 1	Subject 2
Preliminary Activity	-	-
Main Activity	<p>1. Compliance Question T : “Another opinion? Same or not? (<i>No answer</i>) How about Dita’s group?” S : “Same sir.”</p> <p>2. Probbing Question T : “Okey, the example, Ani throw the dice one time. How many side of one dice?” S : “six sides.” T : “Please, mention the sample space!” S : “n(s) = {1, 2, 3, 4, 5,6}”</p>	<p>1. Compliance Question T : “$A = 30^\circ$ and $B = 45^\circ$. Then write it based on the formula. Who want to try?” S : (<i>No answer</i>)</p> <p>2. Prompting Question T : “If we write like this, $\frac{1}{4}\sqrt{6} - \sqrt{2}$ what does it means?” S : (<i>No answer</i>) T : “Wait, who have $\frac{1}{4}$? Only $\sqrt{6}$ or also $\sqrt{2}$?” S : “Both of them, sir.” T : “So, how to we write?” S : “Give the brackets.” T : “What’s must be brackets?” S : “The root, sir.” T : “Please, write correctly!” S : (<i>one of the student rewrite $\frac{1}{4}(\sqrt{6} - \sqrt{2})$</i>) “Like this, sir?” T : “Another opinion?” S : “Same, sir.”</p>
Closing Activity	-	-

Table 2. The data example of the kinds of question asked by novice teacher based on Revised Bloom’s Taxonomy

Learning Process	Subject 1	Subject 2
Preliminary Activity	<p>1. Rembering Question T : “Today we are discussing about probability. Any one knows the explanation of intersection?” S : (<i>No answer</i>)</p>	<p>1. Remembering Question T : “Let’s we continue the subject. Today we discuss about addition of cosine. What is the formula of $\text{Cos}(A + B)$? (<i>No answer</i>). Read your book, please! Mention the formula! (<i>No answer</i>). Come on, the formula of $\text{Cos}(A + B)$ is?” S : “$\text{Cos}(A + B) = \text{Cos} A \cdot \text{Cos} B - \text{Sin} A \cdot \text{Sin} B.$”</p>
Main Activity	<p>1. Understanding Question T : “$A \cup B = \{2, 3, 4, 5, 6\}$. $A \cap B = \{2\}$. Then, can you calculate the probability of the dice less than five?? Mention it?” S : “1, 2, 3, 4.”</p> <p>2. Analyzing Question T : “Jesika’s group, why n(s) minus 3?” S : “Because each group is taken one.”</p> <p>3. Evaluating Question T : “Eko’s group, give your opinion please!” S : “It’s same sir.”</p>	<p>1. Remembering Question T : “Who want to try? (<i>No answer</i>). What is the degree of A?” S : “30° .”</p> <p>2. Understanding Question T : “If we write like this, $\frac{1}{4}\sqrt{6} - \sqrt{2}$ what does it means?” S : (<i>no answer</i>)</p> <p>3. Applying Question T : “Okey, lets try dothis question. Given $A = 30^\circ$ and $B = 45^\circ$. Then, $\text{Cos}(30^\circ + 45^\circ)$? Try it, you just use the formula.” S : “yes, sir.”</p> <p>4. Analyzing Question T : “So, the answer is $\frac{1}{4}(\sqrt{6} - \sqrt{2})$. Then, how about the $\text{Cos}(A - B)$. What is the different?”</p>

Learning Process	Subject 1	Subject 2
		S : “The sign sir. Use plus.” 5. Evaluating Question T : “ $\cos(30^\circ + 45^\circ) = \cos 30^\circ \cdot \cos 45^\circ - \sin 30^\circ \cdot \sin 45^\circ$, is it right?” S : “yes, sir.”
Closing Activity	-	-

3.1. The Kinds of Question-Based on Objective

3.1.1. *Preliminary Activity.* The results showed that the kinds of questions based on the objective which is often asked by novice teachers on the preliminary activity is the questions that ask students to do something related to the material to motivate students to be active in learning.

Based on this, it can be interpreted that the intent of the kinds of questions on preliminary activity asked by novice teachers is to ask students active in the learning process. Therefore, it can be seen that in the preliminary activity of questions that are often asked by novice teachers is a compliance question.

3.1.2. *Main Activity.* The results show that the kinds of questions based on the objective which is often asked by the novice teacher on the main activity are the question that asks students to do something related to the material being taught. The teacher also asks questions where the answer of the question is answered by the teacher. Sometimes teachers ask questions that can direct the thinking process of the students toward the material being taught. The motivation for students to learn more about the material is also seen but on very rare occasions.

Based on the explanation, it can be interpreted that the often kinds of questions on the main activities asked by novice teachers are to ask students actively in learning, providing information to students. Guide the thinking process of students and give motivation to the students to learn more the material taught by teachers in certain occasions. Therefore, it can be seen that in the main activity the questions that are often asked by novice teachers are compliance question, rhetorical question. Sometimes the teacher asked prompting question and probing question.

3.1.3. *Closing Activity.* Based on the results of the research note that there is no kind of question-based on the objective which is observed in the closing activity asked by novice teachers since the teacher maximizes the main activity until the end of the learning process.

3.2. The Kinds of Question-Based on Revised Bloom’s Taxonomy

3.2.1. *Preliminary Activity.* Kind of questions based on the cognitive dimension process of Revised Bloom’s Taxonomy which is often asked by a novice teacher in the preliminary activity that is the question that allows the student to use his or her ability to restate the material taught at the previous learning.

Based on the explanation, it can be interpreted that the kinds of questions on preliminary activity asked by novice teachers make students to maximize the ability to recall and revisit the information that has been obtained in previous learning. Therefore it can be seen that the kinds of questions asked by novice teachers based on the cognitive dimensions process of Revised Bloom's Taxonomy in the preliminary activity are remembered question.

3.2.2. Main Activity. Kinds of questions based on the cognitive dimension process of Revised Bloom's Taxonomy which is often asked by a novice teacher in the main activity are the question that allows the student to use his or her ability to remind knowledge appropriate in long-term memory. Teachers also ask questions that make students use their ability to understand the material being taught. In addition, teachers also ask questions that enable students to use their ability to solve problems using their known procedures. Teachers also ask questions that enable students to use their ability to find the interrelationships between statements to become related entities. The questions asked by the teacher in the form of questions that make students use their ability to examine, assess and criticize the opinions or ideas of other students.

Based on the explanation, it can be interpreted that the kinds of question on the main activity asked by the novice teacher makes the students maximize the ability to recover the relevant knowledge from long-term memory, build the meaning of the learning message and be able to communicate it orally and in writing, using the procedure to solve the problem, Solve a unity into sections and discover how the parts are linked to each other and perform judgments based on certain standards. Therefore it can be seen that the kinds of questions asked by novice teachers based on the cognitive dimension process of Revised Bloom's Taxonomy on the main activity are the remembers question, understands questions, applying questions, analyzing questions and also evaluating questions.

3.2.3. Closing Activity. Based on the results of the research note that there are no kinds of question-based on cognitive dimension process of Revised Bloom's Taxonomy which is observed in the closing activity asked by novice teachers since the teacher maximizes the main activity until the end of the learning process.

4. Conclusion

4.1. The Kinds of Question-Based on Objective

In the preliminary activity, the questions asked by novice teacher is compliance question. The rhetorical question, prompting question and probing question is not asked. In the main activity, questions asked by novice teachers are compliance question, rhetorical question, prompting question and probing question. In closing activity no questions which are asked based on the objective.

4.2. The Kinds of Question-Based on Revised Bloom's Taxonomy

In the preliminary activity, the questions asked only remembering question. Understanding question, applying questions, analyzing question, evaluating question and create question are not asked. In the main activity, novice teachers asked the remembering question, understanding question, evaluating question, applying question. The question of analyze is rarely asked by a novice teacher. Create question were not asked by the teachers. Teachers do not ask questions based on cognitive dimension process of Revised Bloom's Taxonomy on closing activity.

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