

## Questions Used By Novice and Experienced Teacher in Intervening Mathematics Class Interactions

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### Abstract

Learning interventions are mostly carried out by teachers in accommodating students' learning needs according to their characteristics because they can help students in improving their thinking. One form of learning intervention carried out by the teacher is through a question submission. Asking is the most common verbal communication behavior used in teaching. This research is a qualitative research with a descriptive approach because it is based on the research objective, finding out the use of questions by novice and experienced teachers in intervening mathematics class interactions. The subjects in the study were two novice teachers and two experienced teachers. The instruments used were observation sheets and interview guides which had been validated by the validator and declared feasible as research instruments. Checking the validity of the data using method triangulation and data source triangulation. The results of the study show that the use of questions by novice teachers and experienced teachers is still limited to uncovering operational knowledge and basic knowledge, not metacognitive knowledge, they are still using questions with the aim of remembering content that has been previously studied and providing calculation results and have not been able to encourage them to think critically, creatively as well as cultivating conceptual understanding and generating ideas and not directing and building student understanding so that there is a need for training to improve the quality of teachers in mastering techniques for asking questions to students in order to develop and strengthen teachers' pedagogical abilities considering the importance of teachers' pedagogical abilities in implementing the learning process and asking questions in intervening in mathematics class interactions can encourage students to think critically and creatively and foster understanding. concepts and generate ideas and can direct and build their understanding well in order to compete in a global scope.

**Keywords:** Questions; novice teacher; experienced teacher, intervention

## Introduction

Teacher competence is the ability of teachers to carry out their obligations in a responsible and proper manner (Mulyasa, 2007). One of the teacher's obligations is to carry out the learning process. Learning interventions are general components from a series of learning materials and procedures that are commonly used by teachers in the learning process both in the form of approaches, methods, and models (Nurhasanah, 2019). Learning interventions are mostly carried out by teachers in accommodating student learning needs according to their characteristics because they can improve student thinking (Conner et al., 2014) and are a form of curriculum implementation in managing student learning behavior according to their needs (Ishartiwi, 2010) because through an active learning process, students can develop the capacity to think, reason and solve mathematical problems (Kadir, 2017). One form of learning intervention carried out by the teacher is through asking questions (Edwards, et al, 2019) in line with Wasserman (1991) that asking questions is the learning tool mostly used by teachers because a good teacher is a teacher who frequently asks good questions to their students (Aizikovitsh-Udi & Star, 2011).

Asking is verbal communication which is commonly used in teaching (Ellis et al., 2019) because it is a form of interaction in learning communication (Dahal et al., 2019) and is seen as the backbone of communication between students and teachers (Dymoke and Harrison , 2008). Each question is used to test student knowledge such as recalling, understanding, applying something, cultivating knowledge such as analyzing, synthesizing or evaluating (Rasyid, 2017: 32). Mason, et al (2020) stated that asking means using questions and other clues offered to students to help them direct their attention in ways that have the potential for them to gain increased understanding. Chikiwa and Schäfer (2018) state that asking is a basic human activity to gather information, use information for learning, help solving problems, assist decision-making processes and to understand one another more clearly. The teacher questioning technique is a major and important instructional method that all teachers use regardless of grade level and subject. The success of effective teaching teachers is related to the use and development of questioning skills and there is a positive correlation between asking good questions and effective teaching (Döş et al., 2016).

Types of questions that teachers can use in the process of asking questions to students in class. (Heinze & Erhard, 2006; McCarthy et al., 2016; Moyer & Milewicz, 2002a) are classified into 4 categories, namely: (1) Probing and follow-up, (2) Leading questions, (3) Checklisting, (4) Student specific questioning, while according to Hienze and Erhard (2006) it consists of reproductive, closed, open, evaluative and rhetorical questions. (Paul & Elder, 2007) classifies questions into (1) questioning goals and purposes, (2) questioning questions, (3) questioning information, data and experience, (4) questioning inferences and conclusions, (5) questioning concepts and ideas, (6) questioning assumptions, (7) questioning implications and consequences, and (8) questioning viewpoints and perspectives. Knowledge, experience and beliefs and preferences are several factors that influence various kinds of questions (McAninch, 2015).

Zarei & Afshari (2012) classifies teachers into two groups based on teaching experience, namely novice teachers and experienced teachers. Novice teachers are teachers who have less than eight years of teaching experience or someone who is teaching something for the first time (Farrell, 2012). Wiebe Berry & Kim, 2008 stated it means teachers who have less than five years of teaching experience. Cakmak (2013) defines it as a teacher who has completed pre-service training but has less than five years of teaching experience. Michel (2013) states that novice teachers are teachers who are in a transition period and they are expected to do and achieve many achievements but have not yet mastered the instructional skills to do so effectively. Meanwhile, experienced teachers are teachers who have professional knowledge, skills and attitudes (Snoek, et al, 2010). Zarei & Afshari (2012) state that experienced teachers are teachers who have teaching experience that is close to eight years or more.

Several previous studies on teacher questioning, such as effective questions used by mathematics teachers based on gender and social class (Shahrill, 2013), compared questions, responses, and the influence of mathematics teachers' instructional decisions regarding questions and responses to students' ideas among novice and experienced teachers Mc Aninch (2015), Teacher questions for feedback (Mahmud, 2021), Questions from prospective teacher students in teaching mathematics practice (Zayyadi, et, al, 2019; As'ari, et, al, 2021) but the use of questions from novice and experienced teachers in intervening in mathematics classes has not been carried out even though there is a positive correlation between asking good questions and effective teaching (Döş et al., 2016). So it needs to be studied in depth in order to obtain new theories or knowledge considering that teachers are the ones in control in improving students' abilities so that they can advance a country (Akbar, 2021) and in the 21st century teachers are required to improve their pedagogical abilities and competencies as a provision in facing challenges increasingly complex (Somantri, 2021) because quality human resources are really needed in this century, and quality teaching staff are needed to be able to produce them (Anggraini & Hudaidah, 2021). Especially for student teacher candidates it can be used to develop their pedagogical competence, especially in asking questions to students in order to improve students' thinking and reasoning abilities. As well as for teachers, it also can be used as study material and guidelines in developing questioning skills, especially for conducting learning interventions through a series of questions to develop students' thinking and reasoning abilities.

## **Methods**

This research is a qualitative research with a descriptive approach in accordance with the research objective, which is to describe the differences in the use of questions delivered by novice and experienced teachers in intervening mathematics class interactions. Qualitative research is contextual research which is specific and does not generalize the research conclusions (Nugrahani, 2014). The subjects in this study were 2 novice teachers and 2 experienced teachers. Subjects were selected purposively according to the research objectives. The instruments used were observation sheets and interview guidelines for subjects and

interview guidelines for school principals who were validated beforehand and had been declared valid by the validator to use a research instrument. The observation sheet is used to see the questions submitted by the subject during the research, while the interview guide is used to obtain in-depth data to support the observations.

To check the validity of the data, method triangulation and data source triangulation were used. Method triangulation is checking the validity of data from the same source but with different methods, while triangulation of data sources is checking the validity of data through several data sources (Sugiyono, 2016). The technique used is by observing the subject when carrying out teaching and learning activities by recording activities and continuing by conducting semi-structured interviews with subjects after teaching and learning activities are completed and conducting interviews with school principals, so that the resulting data are three, namely transcripts learning videos, transcripts of interviews with subjects and transcripts of interviews with school principals. All data provided by the three data sources are then compared, if the data shows a consistency, similarity of views and opinions then the data is said to be valid, but if not then data retrieval will be carried out on the data source until valid research data is obtained. If research data is still invalid, making a change to the validity of the data technique or research method is needed.

The analysis technique used refers to the Miles and Huberman (1984) model in (Sugiyono, 2013), are data reduction, data presentation and drawing conclusions. The results of the learning video transcripts and interview transcripts were selected as needed to answer the problem formulation. Data that is considered not relevant to the research is discarded, while data that is considered relevant to the research is presented in the research results which is then drawing a conclusion. This study uses the question categories grouped by Paul and Elder (2006) as the indicators for asking questions which are as follows:

**Table 1.** Question Submission Indicators

<b>Indicators</b>	<b>Description</b>
<i>questioning goals and purposes</i>	The subject asks questions with a specific purpose to students
<i>questioning question questioning</i>	The subject asks a question to get a response
<i>questioning information, data and experience</i>	The subject asks questions to obtain existing information or data
<i>questioning inferences and conclusions</i>	The subject asks questions to get a conclusion
<i>questioning concepts and ideas</i>	The subject asks questions to find out an idea and concept
<i>Questioning assumptions</i>	The subject asks questions to get an assumption
<i>Questioning implications and consequences</i>	The subject asks questions to dig deeper information
<i>Questioning viewpoints and perspectives</i>	Subjects ask questions to elicit different points of view

## Results and Discussion

In this section, the research results are presented in a clear and detailed manner. Research results can be presented based on research results at each stage of research or research results that answer each problem formulation or others if the results of the research that have been carried out are visible. Research results should be supported by empirical evidence.

This section may be divided into subheadings. It should provide a concise and precise description of the experimental results, their interpretation, and the experimental conclusions that can be drawn.

In this study, the data being analyzed were the results of video transcripts of learning activities and transcripts of interviews with subjects and school principals. All research source activities were recorded, then a transcript was made and coded with the aim of making it easier to analyze the data. Henceforth, beginner teacher 1 is coded S1, beginner teacher 2 is coded S2, experienced teacher 1 is coded S3, experienced teacher 2 is coded S4, school principal is coded K and students are coded Sw. The following is an analysis of all research subjects:

### Use of Questions by Novice Teachers 1

Implementation of observation activities on subjects during the learning process is the initial stage in conducting research with the aim of knowing the use of questions used by teachers in intervening mathematics class interactions. Based on the video transcript of the learning process carried out on novice teachers 1, the results are as shown in table 2 below:

**Table 2.** Questions used by novice teachers 1

Indicators	Description	Subject Implementation	
		Yes	No
<i>questioning goals and purposes</i>	The subject asks questions with a specific purpose to students	✓	
<i>questioning question</i>	The subject asks a question to get a response	✓	
<i>questioning information, data and experience</i>	The subject asks questions to obtain existing information or data	✓	
<i>questioning inferences and conclusions</i>	The subject asks questions to get a conclusion		✓
<i>questioning concepts and ideas</i>	The subject asks questions to find out an idea and concept	✓	
<i>Questioning assumptions</i>	The subject asks questions to get an assumption		✓
<i>Questioning implications and consequences</i>	The subject asks questions to dig deeper information		✓

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<i>Questioning viewpoints and perspectives</i>	Subjects ask questions to elicit different points of view	✓
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Based on table 2 on the indicators of questioning goals and purposes, and questioning questions, the subject asks questions to his students with the aim of obtaining information about mastery of the material that has been studied and to get responses from his students, the following is a transcript of the learning video on the subject:

- S11 : How can a function be said to have a limit?  
 Sw1 : I don't know ma'am.  
 S12 : ok, let's just discuss it up front.

In the transcript, the subject asks questions to students to find out students' understanding of the material that has been studied and he also gets responses from students for their questions. In the indicators of questioning information, data and experience as well as questioning concepts and ideas, the subject asks questions to his students with the aim of obtaining some data or information on the material being discussed, also to find out the ideas and abilities of students' conceptual understanding of the material being discussed. It is shown in the following learning video transcript:

Look at the following table of  $f(x)$  values.

X	f(x)
1	3
1,5	3,5
1,9	3,9
1,99	3,99
1,999	3,999

S13 : What do you understand about limits?

Sw2 : Approaching

S14 : yes true, so the value is only close. So let's look at this table, all of these x values are close to 2 from the left, so for x values that are close to 2 from the left, how close is the value of  $f(x)$ ?

Sw3 : close to 4

In the transcript, the subject asks questions to students about the data or information contained in the material being discussed as well as ideas and conceptual understanding that students have toward the material that has been taught. In the indicators of questioning inferences and conclusions, questioning assumptions, questioning implications and consequences, questioning viewpoints and perspectives during the activities in the mathematics class, the subject did not ask questions to his students which led them to obtain a conclusion on the material being discussed, did not ask questions so as to raise a assumptions by students, not asking questions to dig deeper information about the material being discussed and not asking questions that can stimulate students to give rise to different points of view.

## Questions used by novice teachers 2

Observation Implementation on subjects during the learning process is the initial stage in conducting research with the aim of knowing the use of questions used by teachers in intervening mathematics class interactions. Based on the video transcript of the learning process carried out on novice teachers 2, the results are as shown in table 3 below:

**Table 3.** Questions used by novice teachers 2

Indicators	Description	Subject Implementation	
		Yes	No
<i>questioning goals and purposes</i>	The subject asks questions with a specific purpose to students	✓	
<i>questioning question</i>	The subject asks a question to get a response	✓	
<i>questioning information, data and experience</i>	The subject asks questions to obtain existing information or data	✓	
<i>questioning inferences and conclusions</i>	The subject asks questions to get a conclusion		✓
<i>questioning concepts and ideas</i>	The subject asks questions to find out an idea and concept	✓	
<i>Questioning assumptions</i>	The subject asks questions to get an assumption		✓
<i>Questioning implications and consequences</i>	The subject asks questions to dig deeper information		✓
<i>Questioning viewpoints and perspectives</i>	Subjects ask questions to elicit different points of view		✓

Based on table 3 on the indicators of questioning goals and purposes and questioning questions, the subject asks questions to his students with the aim of obtaining information related to mastery of the material that has been studied and to get responses from his students, along with a video transcript of learning for novice teachers 2.

It is known function  $f(3x + 2) = x\sqrt{x + 1}$ . If  $f'(x)$  is the first derivative of the function  $f(x)$ , what is the value of  $12f'(11) = \dots$

S21 : since the question is  $12f'(11)$ , what should we do?

Sw1 : find  $f'(x)$

S22 : yes good

In the transcript, the subject asks questions to students to find out students' understanding of the material that has been studied and he also gets responses from students for their questions. In the indicators of questioning information, data and experience as well as questioning concepts and ideas, the subject asks questions to his students with the aim of obtaining some

data or information on the material being discussed as well as to find out the ideas and abilities of students' conceptual understanding of the material that has been taught. as shown in the following learning video transcript:

S23: how it should be?

Sw3 : we must use the multiplication rules

S24 : yes good. What is the formula of multiplication rules?

Sw4 :  $f'(x) = u'v + uv'$

S25 : Yes, that's right.

$f'(x) = u'v + uv'$

$$3f'(3x+2) = \int \sqrt{x+1} + x \cdot \frac{1}{2\sqrt{x+1}}$$

because we are going to find the value of  $f'(11)$ , so in order to make  $3x+2$  be 11, what value of  $x$  must be?

Sw5 : 3

S26 : yes right, now try to pay attention to this:

$u = x^2 + 2x - 2$  Then  $u' = 2x$ . is this right or wrong?

Sw6 : wrong, it should be  $u' = 2x + 2$

S27 : yes right, now we see for  $v = 2x - 1$  then  $v' = 2$ , is it right or wrong?

Sw7 : right ma'am

In the transcript, the subject asks questions to students to find out the data or information contained in the material being discussed as well as the students' ideas and conceptual understanding of the material being discussed.

In the indicators of questioning inferences and conclusions, Questioning assumptions, Questioning implications and consequences, Questioning viewpoints and perspectives during the activities in the mathematics class, the subject did not ask questions to his students which led them to obtain a conclusion on the material being discussed, did not ask questions so as to raise a assumptions by students, not asking questions to dig deeper information about the material being discussed and not asking questions that can stimulate students to give rise to different points of view.

## Questions used by experienced teachers 1

Observation Implementation on subjects during the learning process is the initial stage in conducting research with the aim of knowing the use of questions used by teachers in intervening mathematics class interactions. Based on the video transcript of the learning process carried out on subject 3, the results are as shown in table 4 below:

**Table 4.** Questions used by subject 3

Indicators	Description	Subject Implementation	
		Yes	No
<i>questioning goals and purposes</i>	The subject asks questions with a specific purpose to students	✓	



<i>questioning question</i>	The subject asks a question to get a response	✓
<i>questioning information, data and experience</i>	The subject asks questions to obtain existing information or data	✓
<i>questioning inferences and conclusions</i>	The subject asks questions to get a conclusion	✓
<i>questioning concepts and ideas</i>	The subject asks questions to find out an idea and concept	✓
<i>Questioning assumptions</i>	The subject asks questions to get an assumption	✓
<i>Questioning implications and consequences</i>	The subject asks questions to dig deeper information	✓
<i>Questioning viewpoints and perspectives</i>	Subjects ask questions to elicit different points of view	✓

Based on table 4 on the indicators questioning goals and purposes, questioning questions, questioning information, data and experience as well as questioning concepts and ideas the subject asks questions to his students with the aim of obtaining information about mastery of the material that has been studied as well as ideas and conceptual understanding of the material being discussed, as well as to get responses from students, the following is a learning video transcript on the subject:

S31 : first, for example there is  $\frac{3}{4} : \frac{6}{8}$ , before you do the operation, first change the division into multiplication form. So, how to change the  $\frac{3}{4}$  division, you change it to multiplication, then you turn the fraction behind the division or the fraction behind it. Pulls the top to the bottom and pulls the bottom on top. We can say the quantifier becomes the denominator and the denominator becomes the quantifier. So, how much is this?

Sw1 :  $\frac{8}{6}$

S32 : If you have multiplied it, it's the same as yesterday, you just have to multiply it, but as I said before you multiplied it, what you have to first?

Sw : Simplify first

In the transcript, the subject asks questions to students to find out about students' understanding of the material that has been studied and finds ideas and conceptual understanding of the material being discussed and he also gets responses from students for their questions.

In the questioning assumptions indicator, the subject asks questions to his students with the aim that students can bring up an assumption about the material being discussed. as the following learning video transcript:

- S33 : Done? Then please continue. So, you have to match it first, understand? You have to first equate the number of digits behind the comma. After that, you just need to delete the commas.
- Sw3 : How about all are one?
- S34 : How about all are already shown one? If you have the same number of digits after the comma, you don't need to add more. No need to equate again. All you have to do is remove the commas.
- Sw4 : For example,  $3.00 \div 2.0$ ?
- S35 : (write questions asked by students on the blackboard) like this? Just look at this, actually if it's zero, it can be deleted, right? Even if you don't want to delete it, just equate it, this is 2 (pointing 3.00) and this is one (pointing 2.0). how much if it is added?
- Sw5 : zero

In the transcript, the subject asks questions to students so that it raises students' assumptions about the material being discussed. In the indicators of questioning inferences and conclusions, Questioning implications and consequences as well as Questioning viewpoints and perspectives during the activities in the mathematics class, the subject does not ask questions to his students which leads them to obtain a conclusion on the material being discussed, does not ask questions to dig deeper information about the material being discussed and do not ask questions that can stimulate students to give rise to different points of view.

## Questions used by experienced teachers 2

Observation Implementation on subjects during the learning process is the initial stage in conducting research with the aim of knowing the use of questions used by teachers in intervening mathematics class interactions. Based on the video transcript of the learning process carried out on experienced teachers 2, the results are as shown in table 5 below:

**Table 5.** Questions used by experienced teachers 2

Indikator	Deskripsi	Implementasi subjek	
		Ya	Tidak
<i>questioning goals and purposes</i>	The subject asks questions with a specific purpose to students	✓	
<i>questioning question</i>	The subject asks a question to get a response	✓	
<i>questioning information, data and experience</i>	The subject asks questions to obtain existing information or data	✓	
<i>questioning inferences and conclusions</i>	The subject asks questions to get a conclusion		✓
<i>questioning concepts and ideas</i>	The subject asks questions to find out an idea and concept	✓	
<i>Questioning assumptions</i>	The subject asks questions to get an assumption	✓	

<i>Questioning implications and consequences</i>	The subject asks questions to dig deeper information	✓
<i>Questioning viewpoints and perspectives</i>	Subjects ask questions to elicit different points of view	✓

Based on table 5 on the questioning goals and purposes indicators and questioning questions, the subject asks questions to his students with the aim of obtaining information about mastery of the material that has been previously studied and to get responses from his students, the following is a transcript of the learning video on the subject:

S41 : Ok for today I will explain about the composite figure or what is called the area of the combined area. Yesterday, I explained about the area of the circle. Area of circle, area of semicircle, and area of quarter circle. Any question about area of circle and semicircle or quarter circle?

In the transcript, the subject asks questions to students to find out about students' understanding of the material that has been studied before and he also gets responses from students for their questions.

In the indicators of questioning information, data and experience, questioning concepts and ideas, the subject asks questions to his students with the aim of obtaining information or data on the material being discussed and to find out ideas and students' conceptual understanding abilities. It is shown in the following learning video transcript:

S42 : Now, I will ask you, circumference. What is the formula of Circumference circle?

Sw2 :  $\pi \times d$

S43 : Ok. Besides that? If you know the radius?

Sw3 :  $2 \times \pi \times r$ .

S44 : and what is the formula for the area of circle?

Sw4 :  $\pi \times r^2$

In the transcript, the subject asks questions to students so that ideas and students' understanding of the material being discussed can be seen. In the questioning assumptions indicator, the subject asks questions to his students with the aim that students can bring up an assumption about the material being discussed. as the following learning video transcript:

S45 : Math is great, guys. Can you make loops (draw loops). There's a picture like this. You are asked to calculate the area and perimeter. What is known is only this part, which is 15 cm. Now I wants to ask, if we asked to find the circumference, it means this section is added to this section and this (pointing at the picture). What is the forms if these (pointing at the ½ circle) are combined?

Sw5 : circle

In the transcript, the subject asks questions to students so that it raises students' assumptions about the material being discussed.

In the indicators of questioning inferences and conclusions, Questioning implications and consequences as well as Questioning viewpoints and perspectives during the activities in the mathematics class, the subject does not ask questions to his students which leads them to obtain

a conclusion on the material being discussed, does not ask questions to dig deeper information about the material being discussed and do not ask questions that can stimulate students to create different points of view.

## Results of interviews with school principals

After making an observation to observe the use of questions used by teachers in intervening mathematics class interactions, the interviews with experienced teacher principals was conducted. Based on the transcript of the interview with the school principal, it was found that experienced teachers 1 and 2. After conducting interviews with the school principal, it turned out that experienced teachers A and B had different educational backgrounds. Experienced teacher A is a bachelor of mathematics education, while experienced teacher B is a bachelor of mathematics.

Based on the presentation of the results of this study, it can be seen that novice teachers in conducting interventions in mathematics class interactions still ask questions only to find out students' knowledge of the material that has been studied before and provide calculation results, ideas and conceptual understanding of the material that has been studied but have not asked questions that can bring up students' assumptions about the material being discussed, cannot bring up different perspectives from what is taught by the teacher, cannot ask questions whose purpose is to dig deeper about what students know about the material being discussed and cannot ask questions that can direct them to be able to draw a conclusion on the material being discussed. In class interactions, novice teachers tend to provide open-ended questions and have not directed students to think deeply about the learning material. This is in line with research conducted by Farrell (2012); Sezer (2017); Murtafiah (2020); Kim and Roth (2011); Cakmak (2013); Michelle (2013); Muthmainnah (2019); Stanke & Sigred (2021); Ilyas (2013); Addini (2018); and McAninch (2015).

Teachers who are experienced in intervening mathematics class interactions also still ask questions just to find out students' knowledge related to the material that has been previously studied and provide calculation results, ideas and conceptual understanding of the material and raise students' assumptions about the material being discussed, but not yet asking questions that can bring up different perspectives from what is taught by the teacher, have not been able to ask questions whose purpose is to dig deeper about what students know about the material being discussed and have not been able to ask questions that can lead them to be able to draw a conclusion of the material being discussed. This implies that the experience possessed by the teacher is not directly proportional to the pedagogic skills they have, which is the skills to ask questions and the background possessed by the teacher is not directly proportional to the pedagogic competence they have, especially in class interactions. This is contrary to the results of research conducted by Hill, et al. (2008) which states that the teacher's mathematical knowledge is directly proportional to the teacher's pedagogic competence in teaching and König and Pflanzlb (2016) which states that there is a positive correlation between knowledge of the teacher's pedagogic competence and the way the teacher teaches in the classroom.

The results of this study are in line with previous research conducted by (Döş et al., 2016) that the questions that teachers often ask are limited to revealing operational knowledge, not metacognitive knowledge and giving rise to different perspectives and still using probing questions. Even though every teacher's question submission should be used to test student understanding, encourage students to think critically, structure and direct learning and build students' understanding (Borich, 1996). In line with Rasyid (2017) that questions are used to test student knowledge such as recall, understand, apply something, and generate knowledge such as analysis, synthesis or evaluation. The teacher questioning technique is the main and important instructional method that all teachers use regardless of grade level and subject (Yesil & Korkmaz, 2013). The success of effective teaching is related to the use and development of questioning skills (Nielsen, 2009) because asking is the tool mostly used in the learning process (Wasserman, 1991) and it is the backbone of communication between students and teachers (Dymoke and Harrison, 2008). A teacher's questioning skills include preparing important questions beforehand, asking questions clearly and concisely, asking questions to stimulate students' thinking, and giving students enough time to think and prepare answers (Ralph, 1999).

From this discussion it can be seen that both novice teachers and experienced teachers are still not good at asking questions as interventions for mathematics class interactions, they tend not to ask questions that can encourage them to think critically and creatively and foster understanding of concepts and generate ideas and not direct and build student understanding. They still use questions with the aim of remembering previous learned content and providing calculation results, whereas according to Heinze & Erhard (2006) that asking such questions is a low-level cognitive question. There is a need for teachers' quality improvement training in mastering the technique of asking questions to students so that the submission of questions posed in intervening mathematics class interactions can encourage them to think critically and creatively and foster conceptual understanding and generate ideas and can direct and build student understanding, because development appropriate questioning techniques are an important part of the teaching and assessment of mathematics (Moyer & Milewicz, 2002b).

## **Conclusion**

Based on the presentation of the research results, it was concluded that there was no significant difference between novice and experienced teachers in asking questions to intervene in mathematics class interactions. The submission of questions posed by novice and experienced teachers is still in the limited stage of uncovering operational knowledge and basic knowledge, not metacognitive knowledge. Teachers still use questions with the aim of remembering previous studied content and providing calculation results and have not been able to encourage them to think critically, creative and fosters understanding of concepts and generates ideas and does not direct and build student understanding.

There is a need for training to improve the quality of teachers in mastering techniques for asking questions to students in order to develop and strengthen teachers' pedagogical abilities considering the importance of teachers' pedagogical abilities in implementing the learning process and asking questions in intervening in mathematics class interactions can encourage

students to think critically and creatively and foster understanding. concepts and generate ideas and can direct and build their understanding well in order to compete in a global scope.

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## Conflicts of Interest

The authors declare that there is no conflict of interest regarding the publication of this manuscript. In addition, ethical issues, including plagiarism, errors, falsification of data, multiple publications and/or submissions have been fully addressed by the authors.

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