

AN ESSENTIAL COMPONENT OF ALL CLASSES: QUESTIONING

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**Abstract**

Questioning took a big place in mathematics classes. I experienced that in BLIS with 8<sup>th</sup> grade students and expressed my observations in this paper. The whole lesson was conducted by a variety of questions about surds. Additionally the teacher, Ms. Muna Kaya, used classroom management techniques effectively during the questioning answering part. I observed and noted all the questions that Ms. Kaya asked to her students. Furthermore I expressed the numbers of the answered and asked questions by the students within their seating plan.

*Key Words:* questioning sequence, preparing appropriate questions, the aim of the questioning.

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### Introduction

The purpose of this article was to express my experience about observing questioning in BLIS. The class that I observed was an 8<sup>th</sup> grade class with 17 students and the teacher's name was Muna Kaya. The topic was *surds* and it began such a review class, and then continued with drill exercises by using an effective questioning-answering period. Additionally the students learned new concepts of the topic within small explanation parts of the teacher.

### A Classroom Full of Mathematics Questions

Questioning is an essential part of all classes, particularly in mathematics. A good questioning provides students to be aware of their own learning process, therefore students could catch the missed points of the topic. It also helps the teacher to evaluate the students' understanding level both individually and as a whole of the class. However it is not very easy thing to ask effective questions which are appropriate to the students' level. It requires well-prepared open and closed ended questions and the teacher re-evaluates the lesson running by considering both the questions and responses of the students.

It is a very interactive period to conduct a lesson by using questioning-answering. Here, I added a table which shows the seating plan of the class with the number of answered questions for each student and the number of questions that the students asked to the teacher. As it is seen in Table 1, every student answered at least one question during the lesson.

Table 1

*The seating plan of the class with the number of answered/asked questions*

Girl (3) / (0)	Boy (2) / (0)	Girl (5) / (1)	Boy (8) / (1)	Girl (1) / (0)
Girl (1) / (1)	Boy (7) / (0)	Girl (2) / (0)	Girl (2) / (0)	Boy (5) / (0)
Girl (4) / (0)	Boy (3) / (0)	Boy (3) / (0)	Boy (4) / (1)	Girl (2) / (0)
Boy (3) / (0)	Boy (2) / (0)			

Table 2

*Total asked/answered questions and average per girl and boy*

Class 8C	Ask	Answer	Total	Average
Girls	2	20	22	2.75
Boys	2	37	39	4.33

Asking appropriate questions is harder than answering the questions for the students. It could be seen in Table 2. While students were answering to 57 questions, they were able to ask just four questions. It is also the answer of why the teacher asked so many questions in the lesson. When we –trainee teachers- asked about the lesson running after the lesson, Ms. Kaya explained one of her aims in addition to the lesson objectives. It was that she tried to realize the students how they could ask right questions during the process of when they were doing the exercises on their own. Since the class began as a review class about surds, the teacher had a chance to ask many questions and then by linking those questions to *conjugates of surds* and *rationalizing the surds* she asked much more questions, too. Here are the questions that Ms. Kaya asked:

1- Is there anyone who wants to try to do this example? ( $5\sqrt{18} + \sqrt{72} - \sqrt{75} = ?$ )

What must we do here? (Knowledge)

You realized about  $\sqrt{9}$  for  $\sqrt{18}$  ; then what does  $\sqrt{9}$  become to? (Knowledge)

Similarly, do you realize any other things for  $\sqrt{72}$  and  $\sqrt{75}$  ? (Comprehension)

Can you combine all the roots together? (Knowledge)

2- How are we going to combine these surds? (Knowledge)

3- How do you simplify this? (Comprehension)

4- What do you need to expand an expression? (Knowledge)

- 5- How do you extend this expression? (Application)
- 6- Will  $2\sqrt{3} + 2\sqrt{3}$  give you zero? (Application)
- 7- Will  $-12\sqrt{2} - 12\sqrt{2}$  give you zero? (Application)
- 8- How do you move on from here? Isn't it a square? (Evaluation)
- 9- Are there any differences between  $\sqrt{35} - \sqrt{14} - \sqrt{10} + 2$  and  $\sqrt{35} - \sqrt{10} - \sqrt{14} + 2$ ?  
(Analysis)
- 10- Can you remove the first bracket of the expression? (Knowledge)
- 11- Can I move on for  $\sqrt{100} - \sqrt{64}$  more? Or, is this the final answer? (Evaluation)
- 12- What do you notice about the answer of  $(\sqrt{10} - \sqrt{8}) \times (\sqrt{10} + \sqrt{8})$ ? Why do you think it is an integer? (By the way, the teacher explained the concept of *conjugates*.) (Synthesis)
- 13- What is the difference between  $\sqrt{100} - \sqrt{64}$  and  $(\sqrt{10} - \sqrt{8}) \times (\sqrt{10} + \sqrt{8})$ ? (Analysis)
- 14- When the answer is a surd or not? (Evaluation)
- 15- What will happen when I multiply conjugates? (Application)
- 16- Can you write me its conjugate? (Application)
- 17- What happens if we expand the binomials? (Application)
- 18- How does she get the  $a^2 - b^2$  from  $(a - b) \times (a + b)$ ? (Analysis)
- 19- You can only use this expression if...? (The teacher is expecting students to fill in the blank with their own words.) (Synthesis)
- 20- Rational reminds me...? So, what could *rationalizing* mean? (Synthesis)
- 21- What do you think we can do with  $\sqrt{3}$  for this example  $(10/2\sqrt{3})$ ? (Comprehension)
- 22- If I multiply the denominator with  $\sqrt{3}$ , then what will happen on the numerator?  
(Knowledge)
- 23- Can someone make me a prediction? Why do we need to do rationalizing? (Evaluation)

24- What if I have things like this,  $5/\sqrt{2} + 4/\sqrt{11}$  ? (Synthesis)

25- What do you think about, why did Ms. Kaya do this and get that? (Evaluation)

During the whole lesson, classroom management techniques accompanied to questioning-answering part. First of all, the teacher was very energetic in front of the board and she was very enthusiastic. In this way, Ms. Kaya managed to keep the students' attention on. Her questions were clear and understandable. Most of the times, the teacher asked the questions to the whole class without saying the names of any students, waited for a while and then wanted one of them to answer the question. But sometimes Ms. Kaya asked directly to one student by calling the students' name. He/she was usually dreamy or talking to another student. When the student heard his/her own name, then he/she tidied himself/herself up. The teacher also made her volume up when there was an increasing noise. It helped her to control the class, too.

Moreover, I observed that Ms. Kaya tried to have an eye-contact with each of the students and I think it helped her to understand who was diffident about the topic/questions. So, sometimes Ms. Kaya differentiated her questions or gave some examples/clues to make sense of the main idea of the question for the students. Additionally she asked her questions step by step to different students to clarify the process. I think it facilitated to catch the main ideas of the topic for the students. And this increased the participation of the students to the class.

The teacher monitored the students effectively. Sometimes students got different answers on their notebooks and the teacher gathered different approaches on the board. Ms. Kaya wanted students to write their own solutions on the board and express why they preferred this solution. Some of them were incorrect, but she did not reject them directly. Instead, Ms. Kaya asked for the other students' ideas about which one(s) they agreed and why. Furthermore, Ms. Kaya encouraged the students without giving the right answer. Such as saying "Keep going. Go on, trust yourself, Dağlar. She might be wrong or right, we do not know it yet" or "Do not be scared

Zeynep. I am just making comment”. And she used praises such as “Well done!” “Bravo!” “That is it!”

One other thing was that the teacher used *group alerting* technique to gain the students’ attention to make each of them involve to the class. For example she said “I wonder who can simplify this expression?” or “Is there anyone who wants to do this exercise?” etc. After gaining the students’ attention, Ms. Kaya gave time to students to think and by the way she monitored each student. The teacher tried to give a right to speak, ask or answer to each student in the class.

### **Conclusion**

The purpose of this article was to explain my observations of the questioning techniques and sequences in an 8<sup>th</sup> grade mathematics class. I learned that it is very essential to ask appropriate questions in the right place and right time. Also it is very important to choose your words correctly by considering what you expect students how to answer. To be able to do this, a good preparation would be necessary. A variety of questions which is related to the aims/objectives of the lesson must be prepared in advance such as open ended, close ended, basic, challenging and so on. I think questioning is one of the most effective ways both for students and teachers to be able to follow the learning/teaching process. Also it provides an entire understanding of the topic with its key points.

"A Bilkent student does not lie, cheat, or steal or tolerate those who do. On my honor, as a Bilkent student, I have neither given nor received unauthorized aid on this academic work."

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