

Matthew Fahrenbacher
C& I 304

Questioning For Understanding

My first idea, which I have continued to work on to this date, is to study how waiting by questioning teachers effects the learning process. What drove me to this idea was observations of what other teachers I observed had done and what I found myself doing in regards to questioning. For the most part, I saw questioning used and abused - what the student said next was not really important; it was almost more of a break for the teacher (myself included) and a chance for students to catch up on notes. Because I view mathematics as a discipline that requires the ability to ask the right questions, I felt that the questioning that was going on was not adequate.

To deal with this situation, I had to ask myself, "what's the point of questioning?" And of course, this question is an answer to itself and truly ironic. What I was searching for was that right question so that I could come up with the correct answer, and that's exactly how I want questioning to work in the math classroom. Most students understand the ideas, the processes, and the algorithms, but they are unable to see how they all fit together. On tests and quizzes this can lead to disasters as students blank out and cannot recall what they learned. I feel that the real problem is that students do not know, or are unable to come up with, the right questions to ask to help them through those "black out" moments. This thought process has lead me to two conclusions: First, questioning skills are the most important part of a math classroom - they generalize well to all other disciplines in and outside of school, and provide a framework for students to work with to deal with any new situation (more important than the quadratic formula, at least I would say!). Second, because I believe my command of the subject is so strong, I need not waste time edifying myself with the fact that I know math - instead, my goal should be on teaching and modeling to my students how to question.

So how does this fit into waiting? I found that by waiting after a question was asked, either by myself or by a student, I was able to make questioning a larger and more important part of my math classes. In fact, I sometime wait out bad questions for the good questions! For example:

Allisa: How do you do this problem?

Mr. F: (pause) Well, what do you want to do?

Allisa: The problem.

Mr. F: (laughter) (pause) (look of anticipation)

Allisa: ...which is graphing $(x+1)/(x-1)$.

Mr. F: Good. What can we do now?

Allisa: Do we find the vertical asymptotes first?

Mr. F: Could you?

Allisa: Sure.

Mr. F: Okay.

The "bad" question is how, because my student was looking for me to tell her what to do. The good question was a redirection: what do we even want to do? Once a student figures that part out, the rest of the process becomes much easier.

So what is my hypothesis? I hypothesize that by waiting after questions, created by students and by teachers, the importance of questioning can be conveyed and students can better attack mathematical situations. My tests have been completely qualitative, based mainly on observations by myself and other teachers. First of all, I have noticed that most of my students are doing much better than they were last semester! I am not sure if I can directly attribute this fact to the waiting I have been using or to the fact that I may be more lenient than my cooperating teachers. Second of all, I have noticed that the number of students offering up answers has increased and diversified. I found at the beginning of my student teaching experience that there was a core group of students who wanted to be called on every day. But by increasing my wait time after questions, I have been able to tap a whole other level of students who are thinking about the mathematics. Another interesting thing I've noticed is that students seem to stop talking when they want to be called on - waiting an extra couple seconds after a question allows for more of the classroom to focus in on the question, and when a majority of the students quite down, even the minority group of talkers listen in!