Encouraging and Responding to Students' Questions

Rawatee Maharaj-Sharma

I sat in my first physics class as a student about seventeen years ago. Many important things stand out in my mind about that day, but perhaps the most memorable was a statement made by the teacher. He said, "I can tell you more about your understanding of the subject [physics] from the questions you ask than by the questions you answer." At that time I thought that his statement was simply a ploy to get the students in the class to talk, and I totally disregarded his comments.

Several years later, when I became a physics teacher faced with the responsibility of assessing and evaluating students' learning and understandings, I found myself encouraging my students to ask questions about the subject matter presented. The words of my first physics teacher came back to me as I realized that questions reveal not only one's ignorance, but also one's understanding.

In the field of education, this phenomenon of asking (and answering questions) is always a challenge for teachers at all levels of the system and within all disciplines. Teachers are very often on the asking end of the spectrum, firing fast and furious, and are quite pleased with themselves when students respond in kind, but are greatly disappointed with their students when they are unable to furnish the expected answers. Students, on the other hand, are often on the answering end of the spectrum (as most teachers expect them to be) with very little opportunity for them to ask anything of the teacher—which is a welcome situation in most classes as teachers interpret this to mean that students have acquired the required understandings.

With increasing research on the role and importance of students' questions, as well as the increased focus on this learning strategy in teacher training programmes such as the Diploma in Education and the Bachelor in Education at the School of Education, UWI, teachers are gradually becoming more aware of the need to not only verbally encourage students to ask questions, but also to actively provide opportunities and stimuli for students to ask questions in the classroom. However, teachers often say that they are very concerned about their ability to (a) stimulate students' questions, (b) structure/sharpen their classroom techniques to facilitate the question-asking process, and (c) handle the seemingly "dumb" question.

In my relatively short period of experience as a teacher, I have found that teachers' response to students' questions is the determining factor that either catalyses or inhibits student questioning. Given that students generally do not ask many questions because not much opportunity is provided for them to ask questions, I have realised that many students do not ask questions because they may have previously been "blistered by the caustic edge" of the answers teachers give. There is a very narrow line between the flip, ready, and sarcastic answer that brings embarrassment to the questioner and the answer that takes the whole class (including the questioner) along a merry discovery process.

I once taught an introductory physics course and a student in this course who was hearing about Fraunhofer lines [absorption lines from the solar spectrum that characterise the elements (e.g., hydrogen and sodium) in the sun's atmosphere] in the sun's spectrum for the first time bravely asked me "what Fraunhofer lines had to do with vitamins?" I was more than a bit stunned, for to me there seemed to be utterly no connection between vitamins and the solar spectra. I responded with a rather blunt answer which implied that the question was stupid and irrelevant. After that lesson, I could not get the question out of my mind and I remember spending hours trying to decipher what prompted the student to ask the question and what scientific connections and understandings must been established in the student's mind to have formulated the question in the first place.

Two days later when I saw the student, in a reflex action, I bowed my head in shame, for I realised that I had not only failed to provide an acceptable answer for the student, but that I may also have caused significant emotional damage to the student's inquiring mind. Literally overcome with disgust and a bit of shame, I called the student aside and tried to discover what prompted the question. In this case, the student was genuinely trying to correlate knowledge from different fields, and his reasoning was that in biology, Vitamin D is called the sunshine vitamin and that since the D-lines of sodium are prominent in the solar spectra and in the laboratory spectra seen in the physics laboratory there must be a connection between the two.

The realisation of the limits of my own abilities to probe into the student's understandings made me very uneasy as the student spoke to me, but I eventually proceeded to explain that it is only coincidental that the notations of the vitamins in biology and the Fraunhofer lines in physics are the same. That student deserved and received my apology for not seeing that behind his question was a true quest for knowledge. It became apparent to me after that experience that it is often necessary for teachers to do some quick mental gymnastics, to put themselves into the student's frame of reference, and to guess at what lies behind an apparently irrelevant question.

My experiences have taught me that it is extremely important that as teachers we never forget that a truly educated person is a person with more questions than answers, and that we should transmit this philosophy to our students as we continue to strive for a truly enriching and holistic education for our students and ourselves.

School of Education, UWI, St. Augustine