

Learning, Teaching and Teacher Quality

Success

A major success in science education is the implementation of inquiry and guided inquiry based instruction, as well as a heightened emphasis on critical thinking skills. As a product of the “omniscient teacher and cookbook laboratory” philosophy of science education, I can not begin to express my delight in the general acceptance of the value of inquiry and guided inquiry based instruction. In high school, I took notes, read the text, and studied (memorized is perhaps the better word). I knew, even as a student, that I could study for an exam, pass it with flying colors, and still not really understand the content. My teachers were teaching the way they had been taught. If it was good enough for them, it seems it was good enough for us.

My teaching experience has been decidedly different from my learning experience. My philosophy, I am certain, is similar to others submitting papers for this conference. In addition to covering basic concepts and issues, I continually ask students questions with no “real” answer – just to get them thinking, debating and discussing issues. I tell students at the onset of a course that one of my goals is when they step into a voting booth to make decisions regarding issues that are pertinent to their lives, they can think critically about the issues and, more importantly, think for themselves.

Although the breakthrough to a more learner centered format of instruction focuses on understanding the way students learn, I don’t think the same philosophy has extended through all teaching and learning. It is “trickling up” through pre-service teacher education, but does not seem prevalent for in-service teacher and administrator continuing education. Perhaps if it did, more high quality teachers and administrators would make education a life long career.

Vexation

Although there is currently an intense focus on student achievement and equity, another significant issue has come to the forefront which could considerably impact all student-based issues. In recent years, there has been a renewed focus on the importance of teachers, most notably with new federal standards and definitions. While the attention redirected on teachers is commendable, I am quite irritated by the several of the results. I am also appalled by recent comments made by leaders in the education community, which again reflects the importance of high quality of teachers and administrators.

Paul Brandwein emphasized the importance of the teacher as a key component in student success in science. We recognize that merely because a person knows and understands science, the result is not necessarily a good science teacher. We also recognize that a good teacher in another subject may not make a good science teacher. Somehow, this knowledge is not reflected in the statutes now dictating what it means to be a highly qualified teacher. My key issues with elements of the renewed attention on teachers are as follows:

A “highly qualified” teacher is NOT the same as a high quality teacher. The federal definition of a highly qualified teacher concerns obtaining degrees and passing exams. Is a good or adequate performance on a test a true indication of one’s knowledge and understanding of science and the teaching of science? I think the answer is a resounding NO....for students of all ages. The accumulation of degrees and the passing of exams may make a teacher highly qualified, but it may not result in a high quality teacher. This, in my opinion, is a much more important issue. A high quality teacher links great teaching with

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knowledge in one or more content areas, passion with a discipline, and a love for children (Bassett 2003). A high quality teacher also encourages students to think critically and independently.

Even if high quality curriculum exists, there is no guarantee that it will be implemented properly. Proper implementation rests with the skill, passion and creativity of the teacher. Conversely, a high quality teacher can take a sub par curriculum and turn it into an exemplary curriculum.

Teachers are some of the most important life influences – for better or worse. Teachers are extremely influential in the lives of their students. If a teacher has misconceptions about science or worse yet, which of his / her students can or cannot learn science, this may have a significant impact on all the students this teacher instructs. This tenet also rings true at the administrative level. The higher education community experienced this as recently as last year in some of the highest ivy-covered walls of academia. Just consider for a moment the array of lost human potential from all walks of life, including women and underserved populations, based on the actions and attitudes of such teachers and administrators.

There are additional dilemmas resulting from teacher actions and attitudes. Imagine a teacher who is afraid of or uncomfortable with science, trying to teach science to a class (been there, seen that). All but the students already interested in science will likely recall this experience with the same fear and discomfort displayed by the teacher. The scene is common in all subjects, but has particularly been noted in elementary science classrooms. The lack of understanding and acceptance of science by students and the general public often results distrust, and in students being turned off to science before they've even been properly exposed to it.

Teacher and administrator quality is an overarching education issue, but is particularly important in a global society dominated by science and technology. How do we ensure that our educational systems, at all levels, are comprised of high quality educators??? Perhaps part of the key is to focus on how our teachers and administrators learn, particularly the in-service teachers. Once beyond the hallowed halls of our college and university systems, many science teachers spend their professional development time in district mandated seminars, often sitting in large rooms listening to lectures. Could this part of the reason we cannot attract or retain high quality teachers? And how can we attract potential high quality teachers to the profession (and keep them)?

Bassett, P.F. (2003). Searching for great teachers. *Education Week*, 22 (24), pp. 26,28.