

Research with Classroom Applications and Implications

A Success

As a high school teacher for the past 20 years I believe that the science education community had a very big impact on my teaching. From the beginning of my teaching career I was influenced by Science Education Research. Learning Cycle Project (Utah State University), Operation Physics (San Diego State University), Comprehensive, Conceptual, Curriculum Physics (University of Dallas), Modeling Physics (Arizona State University), TRAC Program (Department of Energy), all molded me as a science teacher using education research. My classroom evolved with me as the programs that I attended became a part of my understanding or how to better reach the students that I teach. I evolved from a lecturer, to a demo lecturer, to a teacher who values science educational research and its use in the classroom.

I believe at about 7-10 years into the process of trying to become a good teacher that I realized that I could entertain my classes, make exciting and enjoyable science lessons, but that my students tests scores were not much if any better than state and national averages. This is the point that I turned to science education research and tried to understand how I could help my students show that they really were internalizing the science concepts that they were being taught. At this point I started to understand that it was the student that needed to be engaged, not the teacher. I will be careful with the previous sentence because it is a little misleading. I was never before more engaged in the learning process of my students than at this time but it was more of a mentor for my students as they carried out explorations and concept development of the topics that were being introduced.

If you visited my classroom, students could be seen solving problems, building labs and apparatus to solve problems, presenting findings to the group and going thru peer review of their work. Students would say we have to understand what we are doing because we are all expected to orally report on the work we have been doing. I now have to know it because I have to be able to explain it. The complete class became a learning community and I for once as a teacher at least felt that my class was involved in the process of developing, constructing, and reconstructing the way they think.

The evolution of my classroom rejuvenated me as a teacher. I would get up excited to go to school and excited to see my students. As the students used the methods I had been taught by Science Education experts I again caught fire as a teacher and was excited to be in the classroom.

My Vexation

Now after 20 years in a science classroom I have changed jobs and am preparing physical science students to become teachers. At Brigham Young University we have a strong physical science teaching program, graduating approximately 15-20 physics, chemistry, earth science teachers a year. My vexation is that as I send my students out into local secondary schools to

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get a flavor for the teaching profession they are coming back to me discouraged. They tell me that they never see classrooms that are using the methods and models that I use with them that are based on science education research. They do not see inquiry; they see lecture, lecture, and lecture!!!

How is it that after nearly 30 years of science education research, best practices, or however we describe our ideal of science education, these methods are not showing up in a majority of science classrooms. What is it about the science education community that makes it so hard for the practicing teacher to put research their classroom and use the research to enhance student learning and understanding? The research is out there. We have methods that will help students learn with understanding and they seem to only have grazed the surface with a minority of teachers. PowerPoint, seems to have replaced overheads and that is about it, (in my opinion the overheads were just as good).

There that's my vexation, why is the research that has been done and validated taking so long to get into our public schools? I want my students at Brigham Young University to be able to go into the public schools and see teaching that is being done based on science education research.