

***“This is What I Mean by Inquiry...”:
Building Teachers’ Social Capital through Participatory Research***

Scott McDonald

The Pennsylvania State University

VEXATION

Last year for Crossroads I wrote about my group of researcher/practitioners, the Invisible College for Inquiry Science Study (ICISS) and our attempt to understand and characterize classroom inquiry science teaching in practice. Since last year ICISS has expanded to include undergraduates and I have begun professional development work with a group of teachers not (as yet) connected with ICISS. Sparked by last year’s Crossroads, these changes in my work have created a context for the feeling that I need to make positive social change, to move from research to research for advocacy. As a result of this evolution, I have begun reframing my work with preservice and inservice teaches in terms of developing social capital through educational research.

In spring of 2009, I was asked by the Superintendent of Happy Valley (pseudonym) school district to work with her high school science department because, based on the results of the recent Pennsylvania System of School Assessment (PSSA) scores of their students, she felt the department was struggling and the high school was very weak compared to the elementary and middle schools. The superintendent told me there were a few “non-negotiables,” including that inquiry would be the method of instruction in all science classrooms. At my first meeting with the teachers, they indicated they had been using inquiry as their mode of teaching, until pressures from the superintendent forced them to teach more traditionally in response to test scores that were “all that mattered.” In addition, they expressed frustration about being asked to “teach reading and math” and had been told there were specific strategies they would be accountable for teaching in those two “non-science” areas. It was interesting, but not surprising that both the teachers and the superintendent saw inquiry as a critical pedagogical approach and both saw the other as the obstacle to inquiry becoming the norm at the high school. After talking with the teachers during the first morning it was clear that the teachers had done some interesting and innovative teaching in the past, but had abandoned much of their effort due to what they saw as external pressures based on test scores. At the end of the first day I suggested we work to articulate a clear vision of what *they* meant by inquiry science teaching. In the absence of that their superintendent, a person with less expertise in science teaching, but more authority, would define it for them. However, developing a shared, clear articulation of what they meant by inquiry science teaching was a non-trivial task. I began to see an opportunity to think of research as a tool for developing teachers’ social capital.

How can teachers overcome the sense they have that they do not have an area of expertise and that they have the responsibility to define their own best practices? In my experience, high school science teachers seem willing to think of themselves as content area experts, but seem unwilling to own their pedagogical expertise. Perhaps this is a cultural/historical holdover from the time when administrators were largely men and teachers were largely women. Perhaps it is rooted in the on-going struggle teacher in the U.S. face to be recognized as professionals. Whatever the reason, I was struck that a group of science educators whose accumulated experience was close to 150 years were unwilling to advocate for themselves as pedagogical experts to an administration that contained little or no science education experience. How is it that teachers either do not have, or do not feel they have the social capital necessary to take on the mantle of teaching experts? For me this vexation becomes: how can I provide professional development opportunities for teachers (both preservice and inservice) that not only improves their teaching, but also builds their social capital, allowing them to be recognized as pedagogical experts?

VENTURE

My venture, it turns out, was not to attempt something new, but instead to reframe activity that was going on in ICISS already. It also actually began almost two years ago without my knowing it. In the fall of 2007, Scott, a sophomore physics major getting certified to teach, met with me to discuss an undergraduate thesis in science education. He was struggling to decide if he wanted to do his thesis in Physics or in Education. As a Physics major he did not have a clear sense for the nature of educational research, so I suggested he spend the summer doing work with ICISS, as a legitimate peripheral participant in an educational research project. By the end of the summer he had become quite proficient at transcription and coding of classroom video and was beginning to make meaningful contributions to the group’s analytical discussions. He continued to

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work intermittently in my research group and in the fall of 2008 he began work on his own study about the impact of teacher interactions on the quality of student discourse during open-ended practicum laboratories. He presented at NARST 2009 as part of the ICISS group. He is student teaching in fall 2009 and has been an educational researcher for almost two years. I have some evidence that his views of teaching have been profoundly changed through his research experience, as well as his view of himself as a person with expertise in teaching. At NARST he engaged in conversations with educational researchers and discussed not only his study, but his understandings about pedagogy more generally. He was willing to put forward an evidence-based definition of inquiry science teaching, saying things like “in this part of the lesson you can see that the teacher’s conceptual questioning is followed by an increase in the amount of student conceptual talk.” In comparison to my conversations with the in-service high school teachers, Scott seemed willing to accept himself as having pedagogical expertise. It is possible this is the nature of Scott’s personality and that the in-service teachers have been constrained by a system of which Scott is not yet a legitimate member. However, the juxtaposition of these contrasting experiences allowed me to reframe my work with Scott as the kernel of a possible venture to address the perception of powerlessness with the in-service teachers.

What I have begun, and hope to continue, is the empowerment of teachers as experts through engagement in educational research. I am working at engaging teachers with educational research, not for the purposes of making local pedagogical change (action research), or developing an inquiry stance on their own practice, but for making contributions to the broader understanding about classroom inquiry science teaching. I believe that through the in-depth examinations of practice and subsequent articulation of their conceptions about inquiry science teaching, teachers can speak more confidently as experts. I believe they will be able to include evidence in their descriptions of excellent practice and ultimately develop the social capital necessary to convince their respective administrators and mentors that they have pedagogical expertise and can make determinations of quality within their own teaching context. I want to help teachers to make evidence-based arguments for the statement “This is what I mean by inquiry...” to a variety of constituencies.

With the pre-service teachers I am working toward engaging them in educational research earlier in their academic career and more systematically across their teacher education program. I am currently talking with faculty across the courses and field experiences in teacher education about beginning video analysis of classroom practice in students’ freshman and sophomore year education courses. Video analysis would be a central activity across courses and by their junior and senior year, when then enter the science methods course sequence, they would be developing their own research projects. In addition, I have reframed my methods course to have an extensive focus on video analysis and evidence-based discussion of practice. Student analyze video from expert teachers as well as video of themselves and their peers with the goal of building a framework for describing excellent science teaching in real classrooms. Both the video and their coding is stored digitally so that they can bring up sections of video from multiple teachers to create bodies of evidence to support their claims about science teaching. This parallels a long-standing tradition in science that is increasingly common – the engagement of undergraduate students in faculty research. There has been considerable work in science education to help teachers understand the nature of science by engaging in scientific research. I contend those same things can be learned in the context of engagement in educational research.

My work with in-service teachers will follow a similar pattern beginning by working together to develop a definition for inquiry science teaching in the form of an analysis framework for teaching. We will then use that framework to make arguments about the quality of their own practice. It is my hope that by engaging teachers in analytical discussions about practice they will develop a language to articulate their pedagogical expertise and thus provide the building blocks of social capital needed to become their own advocates.