

PROVOCATION OR COMPLICITY? A PERSONAL AND PROFESSIONAL NARRATIVE OF REFORM IN SCIENCE EDUCATION

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Vexation

Which is more difficult – envisioning science education reform or reforming science education? This question is not meant to suggest one is more important than the other. Some may argue that the question is not even necessary – that reform does not happen without vision and vision leads to reform. The aims of science education as articulated in Benchmarks for Science Literacy and the National Science Education Standards are generally agreed upon. However, the varying degree to which these aims are manifested in the curriculum, instruction, and assessment of today's schools raises much cause for concern, as well it should. The process of conceptualizing, articulating, and making public the current vision of science education reform took less than five years. The process of actually reforming science education seems to be taking considerably longer. Most of us watch, work within, and/or are subjected to the process of science education reform. For me the process is akin to directing, producing, and watching myself in a home video. Feelings of both pride and disgust alternate like a revolving door, and I continually ask “What does this all mean for my work?”

The Crossroads writing experience has offered me a valuable opportunity for deep reflection on the aims of a socially just science education as articulated in the literature. The pointed feedback from the organizers and conference participants has allowed me to focus with a laserlike intensity on the source of my vexation – the excruciatingly slow pace of science education reform. As I reflect, I surmise that the work of science education reform has not been nearly as well described as the vision and the aims that are associated with the reform agenda. Descriptions of the work that go beyond the neat and tidy retellings of research studies are siloed in the realm of critical science education (CSE) and anyone who has seriously engaged that literature knows that science education “reform” is not a simple repackaging of hands-on activities, is more than neat bag of “instructional” tricks, and must seriously consider the myriad of ways that children, adolescents, and young adults encounter and live at the intersections of science, technology and society. And while research in CSE might tell us more or provide a more accurate retelling, it is clear that the tensions and paradoxes are hard to resolve in ways that address the real desires, needs and challenges of the “subjects” or “participants”. During a moment of clarity (or confusion), I realized that research does not always work, and work is not always research.

Venture(s)

In the midst of cycles of reform, we advance theoretical frameworks, articulate research agendas, and call for grand challenges. However, it has been my experience that the activities that are required to enact research agendas can seem quite disconnected from the activities that that are required for the work of science education reform. My research on the perspectives of science teachers about equity and diversity issues in curriculum and instruction is a case in point. We already know that teacher beliefs are a key factor in how teachers enact curriculum, instruction, and assessment. Despite well-intentioned efforts to circumvent the influence of these beliefs through curriculum design, equity-based instructional strategies, and varied assessment approaches, I know that teachers get the final say. *They are, in fact, the key arbiters of reform.* While I appreciate that we have much work to do in the areas of curricular, instructional, and assessment reform, we have far more work to do in the area of teacher recruitment, retention, and professional development, particularly as it relates to issues of equity and diversity. And this work is incredibly hard, which may explain why we have an institution of schooling that seems to stymie the systemic development of what Henry Giroux describes as teachers as “transformative intellectuals” who might actually do the work of science education reform. The development of “transformative intellectuals” sounds almost glamorous, until you engage in this gut-wrenching, emotionally draining process with another individual or group of individuals. I have never understood the notion of a double-edged sword more profoundly until I talked with a teacher who was ready to leave (or was leaving) the classroom because of perceived and oftentimes very real

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constraints and conflicts he/she had encountered in schools. The reality is the teachers who are best suited for the work of science education reform are the ones we are least likely to retain in the classroom. And the dearth of professional development that focuses on the “deeply held beliefs, knowledge, and habits or practice” science teachers express about “science for all” suggests that we may still not fully appreciate the importance of this work.

How much do we really understand about the work of science education reform – the work that I have come to refer to as the “blood, sweat, and tears” of science education reform? When will we begin to frame socially just science teacher professional development as both a cognitively and emotionally demanding process that challenges the intellect and casts transformation as a necessary outcome for successful learning and teaching? Finally, what will it take for us to demand unequivocally a more socially just science education system? This last question is more personally meaningful to me because I am witnessing firsthand the injustices of 20th century science education reincarnated in 21st century classrooms, leaving me to question my own will and power to act. .

Over the last few years, I have been engaged in the development and implementation of a work agenda that unashamedly dovetails my personal and professional commitments to children I know and do not know. Of course, when the personal becomes professional and vice versa, there are risks – creating conflicts of interests, putting professional advancement in jeopardy, and experiencing the crash and burn of a good idea gone horribly wrong. For a moment, I worry that I have even anticipated these critiques and possible outcomes. But the reality is my work does not get done without the shedding of “blood, sweat, and tears”. Perhaps Crossroads may be the perfect venue for showcasing a kind of social justice work that is more accessible to individuals who may find meaning and a charge of inspiration that they can apply in their own action-driven work. And we may begin to take more seriously the work that makes broader impact possible in the lives of the participants who we “invite” into our studies and research agendas. Last, I submit that the need for conceptualizing, articulating, and making public a science education reform “work agenda” is now! If my assertion causes you to question why this sense of urgency, remember: A new school year has started and the children are waiting...