

## **Research Matters to the Science Teacher – or Does It?**

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### **VEXTATION**

Since I began my career as a science educator, I have had the privilege of working in school–university partnerships. For the past dozen years, I have been an active participant in the K-6 Professional Development School (PDS) Partnership between Penn State and the local school district (<http://www.ed.psu.edu/pds>). This is a robust community grounded in teacher inquiry as a fundamental principle and a signature practice. The mentor teachers I collaborate with are actively engaged in their own professional development and shaping professional development opportunities for their colleagues. They investigate aspects of their own teaching, students' learning, curriculum, etc. and share what they are learning with the community. Moreover, these mentors support and encourage the attempts of the senior undergraduate preservice teachers that they partner with for an entire year to enact reform-oriented teaching approaches aimed at supporting children's learning and personal growth. Some mentor teachers co-plan and co-teach methods courses taken by preservice teachers in the PDS with university faculty.

Mentors in the PDS are driven by a desire for learning to be meaningful and equitable for the children they teach. Many are willing to explore a variety of resources, including research journals, and thoughtfully apply approaches that differ from their existing practices. In this way, they fit the profile of what Darling-Hammond & Bransford (2005) refer to as adaptive experts (versus routine experts) in that they are willing to become less efficient and emotionally vulnerable for a period of time while they investigate new practices. In some cases, mentor teachers also collaborate on research projects with university faculty. For example, two elementary school teachers have been ongoing collaborators with me on a NSF-funded project. Products of our research and practice have been published in *Science & Children* and *Science Scope*, as well as in research journals.

Given this context (yes, I know I have it incredibly good), I tend to bristle at initiatives that refer to a research–practice divide and the need to bridge it. This is often code for taking what the research community deems to be important and relevant educational research and “translating” it in such a way that teachers can understand and use it – not quite dumbing it down, but close. More recently, research-to-practice initiatives appear to be driven by the need to communicate research findings to the general public and policy-makers. While I am drawn to models where inquiry communities include teachers and university faculty engaged around problems of practice, I recognize that this requires a tremendous investment in the development of relationships and does not scale easily. Nor is it the kind of relationship that all teachers and university faculty find desirable.

So after years of fighting it, and finally realizing that not everyone works in the kind of context I described above, I have decided to try to understand the notion of research-to-practice more broadly. I personally use the language of research AND practice in order to intentionally avoid the perception of a unidirectional relationship (i.e., research should inform practice) and allow for dialogic interactions among research and practice. After all, why would teachers be interested in hearing what the experts have to say, when their own expertise and experience teaching science is not acknowledged or valued. I have examined a number of initiatives that have research and practice as central components – from professional development opportunities that make the underlying research-base explicit to teachers to teacher researcher models to research briefs for teachers published in journals of the National Science Teachers Association. The wide range of existing approaches signals the need to carefully consider purpose and context when pursuing research–practice connections.

*My vexation is centered on finding balance between my commitment to engaging with teachers collaboratively on teaching and research ventures and finding mechanisms for communicating research findings in ways that are respectful and meaningful to teachers, teacher educators, and others.*

### **VENTURE**

I am currently serving the third year of my term on the Executive Board of the National Association for Research in Science Teaching. As a board member, I chair/co-chair the Publications Advisory Committee. The PAC is responsible for editing E-NARST News (a bi-annual publication that documents the activities of the organization), for maintaining the content of the NARST web site, and for overseeing publications of the organization. Recently we were charged with revisiting *Research Matters to the Science Teacher*. These brief articles for teachers (usually two pages) summarize aspects of science education research and outline implications for classroom practice. Currently more than 30 articles, most published in the 1990's, are available through the NARST web site publications archive. Titles include *Encouraging Girls in Science Courses and Careers* by Jane Butler Kahle, *Authentic Science Teaching* by Glen Aikenhead, and *When are Science Projects Learning Opportunities?* by Marcia Linn and Helen Clark.

For whatever reason, *Research Matters* faded away around 2000. The part that is a bit concerning is that few people seem to have noticed – there was no outcry from science teachers or from the science education community. This is what inspired the title and focus of this vexation.

At the 2009 meeting of NARST, the PAC discussed what it would mean to resurrect Research Matters. Committee members were overwhelmingly in favor of having an outlet for communicating research findings to teachers and others. However, serious concerns were raised over the need for such publications to “count” toward promotion and tenure, especially in cases where the authors are junior faculty. A number of diverse ideas were proposed, such as publishing the briefs in the *Journal for Research in Science Teaching* or starting a new electronic journal. While there was lively conversation and lack of agreement on the outlet for *Research Matters*, the group agreed that we should not wait to get started. As a result, we are committed to generating two research briefs within the next year. I have identified the following questions to guide the work of the PAC, and welcome feedback as the process unfolds.

- How do we include teachers’ voices?
- How do we decide which topics are most important/relevant?
- Who do we invite to participate in writing the briefs? Is there any incentive and/or compensation?
- In addition to NSTA, are there other organizations with whom we should partner?
- How can technology tools be used to update the format, enhance dissemination, and facilitate dialogue associated with the briefs?
- What are meaningful models for using the briefs to support inquiry communities in engaging around problems of practice?

On a related point, I am thinking that reviving Research Matters is only one component of a larger effort for the NARST community to connect with science teachers and teaching. At the 2009 conference, the PAC sponsored a session that highlighted members of NARST who are engaged with teachers in research-rich collaborations. NARST provided free registration and a \$500 travel stipend for teacher collaborators to attend the meeting. While the teachers were very excited to participate and share their work with others, they expressed having difficulty finding sessions that were meaningful to them (no surprise). If NARST is to realize its expressed commitment to teachers and teaching, then we must create and/or support meaningful opportunities for teachers and science education researchers to come together around authentic problems of practice in both teaching and research.

### POSTSCRIPT

The feedback I received on this proposal tapped into the little voices I hear in my head – the ones that say, *Does it really make sense to attempt this through NARST? Is this really an organizational commitment or the passion of a small sub-set of the community?*

The relationships among teachers, administrators, and university faculty in the professional development school setting I described early in this paper reflect key aspects of social capital, particularly trusting relationships and common goals that focus on children’s learning, development and well-being.

Coleman proposes that social capital is intangible and has three forms: (a) level of trust, as evidenced by obligations and expectations, (b) information channels, and (c) norms and sanctions that promote the common good over self-interest. Social capital is inherent in the structure of relations between and among actors. It is defined by its function, and it concerns structures and actors across a variety of different entities. (Dika & Singh, 2003, p. 33)

What about applying some of these powerful ideas to mobilizing a research and practice initiative?

I am hoping that the Crossroads community can help me explore the notion of building a professional development network that reaches out to a range of players (teachers and researchers included) who share a commitment to improving children’s experiences with school science through collaborative investigation of problems of practice. Works in progress and dialogic interactions would be welcomed (sound familiar?) and shared openly using new media and Web 2.0 tools. Crazy talk or the start of something special?