

Framing the professional development of members of the science teacher education community

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On office walls, we used to display photos and posters with the aid of yellow gummy stuff or with special squares of poster mounting tape found during raids of the office supply cabinet. The assemblage of pictures and a few clippings on the walls looked okay – for a college dormitory. More recently, we have had the need to remove items from an office wall (either for a new coat of paint or for a move to a new space), and in the process discovered that a more enduring display of materials improves the overall look of an office wall. Specifically, *framing* a photo from the High Sierras or the picture of a loved one not only frees us from the need for that yellow gum, but also gives a new perspective and brings a new importance to the image. The frame improves the image and sets it apart from the background wall, distinguishing it clearly from the pieces on the wall.

This essay is not meant to be a piece about office artwork or how to create an inspiring and productive works space. Nor is it a description of the day-to-day aspects of the work we do as science teacher educators. Rather, this is our entry into the consideration of how we need to couch our actions within an explicit conceptual framework.

We proffer a framework for thinking about professional development that focuses upon the unique needs of science teacher educators. This framework has been made manifest in the context of our efforts to build supports for science teacher educators, including us. While our initial impetus for this work was to create a professional development alternative, these efforts have developed into a trio of guiding principles that accurately represent a process that exhibits true “proof of concept” and some tangible tools that others can consider, revise, and potentially adopt. While our work has a national scope with as many as forty individuals gathered in one location, we acknowledge that others might apply our framework to good effect with different numbers of individuals and from less dispersed origins. Equally as important, we wish to demonstrate the importance of having a guiding framework, and implore others in *all* venues for professional development – from the local inservice workshop to the national conference – to consider what frame defines and guides professional practices.

CARE AND FEEDING OF SCIENCE TEACHER EDUCATORS

Ill-defined mechanisms for supporting the professional development of science teacher educators are a long-standing problem. While some scholars have broached the ambiguities of teacher knowledge bases, career continua, and professional life cycles (e.g., Huberman, 1989; Feiman-Nemser, 2001; Hiebert, Gallimore & Stigler, 2002; Darling-

Hammond & Bransford, 2005), others have labored with the particularities of science teacher development and induction (e.g., Davis, Petish & Smithey; Roehrig & Luft, 2006; Hewson, 2007). A growing body of literature explores the preparation of future educational researchers (Labaree, 2003; Eisenhart & DeHaan, 2005; Walker, Golde, Jones, Bueschel & Hutchings, 2008) and we find these to be informative and useful resources. Nevertheless we are concerned about the ongoing development of expertise for those individuals who reside along the career pathway from newly-hired assistant professors of science teacher education all the way through to those seasoned individuals who are approaching retirement. When it comes to the “care and feeding” of science teacher education faculty, even though others have pointed to the need to attend to preparing the next generation of science teacher educators (Abell, Gagnon, Hanuscin, Lee & Rogers, 2007), it seems the professional development of science education faculty is still largely left to chance.

Nearly 300 universities in the United States offer doctorates in education resulting in 7000 education doctorates issued each academic year (Snyder, Dillow & Hoffman, 2008). Unfortunately, there are very few formal mechanisms supporting professional development of science teacher educators, especially in the crucial years immediately following the completion of a dissertation. The only exception seems to be an occasional post-doctoral appointment. It is probably accurate to portray newly minted PhDs in science education as fledglings who leave the nest and come to rest in territories where they often isolated and exposed. For the most part, doctoral granting institutions only accommodate 1 or 2 other science educators (Jablon, 2002). At smaller institutions, a recent graduate may find him- or herself as the lone science teacher educator and understandably hard-pressed to secure ongoing support for his or her efforts. For many, their doctoral programs surrounded them with others willing to engage in discourse about science teacher education. And so the post-graduation joy of having one’s own office, desk and phone as the accoutrements of holding the title of science teacher educator is tempered by the absence of regular conversations with others who share our passionate interests about science teacher education. In effect, the hooding ceremony is the occasion to unplug each of us from our intellectual lifelines. The metaphor of leaving the comfortable nest of colleagues and testing the wings for solo flight rings uncomfortably true.

There are many ways to frame learning using variants of sociocultural thought: as a cognitive apprenticeship (Rogoff, Paradise, Arauz, Correa-Chavez & Angelillo, 2003), as the development of identities with communities (Nasir & Hand, 2006), or the emergence of authentic practices (Rahm, Miller, Hartley & Moore, 2003). However it is rare to hear of any learning theories being applied to the experiences of post-dissertation science teacher educators. The absence of theory-driven mechanisms for supporting professional development of this population is ironic if not tragic. Aside from reading journal articles and engaging in email correspondence, the default sites of professional development for science education faculty seem to be the annual conferences. Unfortunately, there is weak alignment between the structure of these conferences and the principles of sociocultural learning theory. Many within the field have survived long enough to win tenure despite the benign neglect of atheoretical professional development. We include ourselves among those who reached that benchmark and consider ourselves fortunate because we lucked into learning from veteran science

educators along the way. Nevertheless, our claim is that such accomplishments should not be the happy accident of chance, privilege, or gamesmanship. Instead, we argue that new entrants to the science teacher education community should not have to fend for themselves.

For the balance of this essay, we describe a framework for professional development (particular to science teacher educators) that has unfolded before us as we designed a novel conference format. The reader should know that creating a professional development framework was not our original plan. Much of this emerged as an outgrowth of the conference series we have been hosting, created as an outlet for our despair about traditional educational conferences. More out of frustration than anything else, we invented a conference we call *Science Education at the Crossroads* in which we place learning by science educators at the center rather than as an incidental by-products of annual gatherings.

A THREE-PART FRAMEWORK

In truth, *Crossroads* was a deliberate re-creation of the best conversations we had with peers in the interstitial spaces of annual meetings. We took what worked for us at such conferences and eliminated all the superfluous components. It was through the maturation of this conference that we came to recognize ingredients that sustained ongoing professional growth. Having distilled the *Crossroads* experience into a framework for professional development, we offer that discovery here with the expectation that it can inform others' efforts. We are not promoting our brilliance at developing this conference but wish to convey what we have gained from it. In particular, we've come to realize and appreciate the fact that most successes are not accidental. Rather, there is often guiding framework, philosophically grounded and goal directed, that offers a foundation for coordinating efforts and influencing decisions.

The framework for professional development within *Crossroads* consists of three interrelated factors: *critical review*, *practice community*, and *joint responsibility*. We are not claiming that these are revolutionary or even all that new; every once in awhile, we stumble across other projects that have similar origins. We are similarly unsure whether this framework can be applied in all situations. We can say, however, that these components have proved crucial within *Crossroads* as well as for those with whom we have worked. At the very least, this represents an *example* of a framework that can guide professional development.

1. Critical review

Although this principle was the last to occur to us, we offer it now because it serves as the necessary first step of the professional development process. In order to give the first *Crossroads* the look of a "real" conference, we solicited proposals for eventual presentation. While these papers were not extensive (only 1500 words in length), we required participants to draft the entire piece rather than an abbreviated version or traditional abstract. To guide the proposal author to sculpt a presentation so it was complementary to the broader conversation, we gave detailed feedback to the author so she or he could revise the paper that would eventually appear in the proceedings. Without realizing the role we

were taking, we discovered that we were behaving more like journal editors than as a review panel. Since accepting the paper was not conditional on the author making the changes we suggested, we had the luxury of enabling a conversation between the author and the two reviewers aimed towards stimulating and focusing the work. Instead of being only gatekeepers, we offered an alternative perspective with the goal of the product being more likely to generate conversation among our diverse audience.

What took us somewhat by surprise was how engaging we found the review process to be and how interactive it was for everyone involved. We were, first of all, hosts of a professional development opportunity, completely open about our role and our identities. Each of us read each proposal, generally starting with John's read and commentary on a piece, followed by Adam's. Each of us commented on the strengths of the proposal and offered suggestions about how to make the piece fit into the context of our conference. This created a conversation: The author was drafting and risking ideas by creating this full draft, and the two of us had the privilege of seeing these ideas in a raw form. We commented upon not only the original work, but on each other's comments. John could make a suggestion for how to pitch an idea, and Adam could offer an alternative perspective. The author was then able to re-read his or her own work through the eyes of two others. It then became the individual's responsibility to choose how to proceed with the work, what to focus on, what things to clarify, and so on.

Within educational parlance, the term "critical" denotes a negative reaction wherein being "deconstructive" loses the "con-" from the word. The subsequent conversation (if there is any!) makes the original author feel defensive and confused. For the principle of "critical review" we prefer to think of the art critic or director who points out the strengths of a piece or performance but also offers ways in which it might be improved and directed towards an outcome that the artist may not perceive. Rather than a critical review serving as a power struggle, we treat it as a way to offer different perspectives about someone's ideas and beliefs. The review becomes generative: it encourages the author by noting the strengths, it challenges the author by pointing out gaps and flaws, and it refines the writing by offering advice about strengthening the message. In effect, the feedback that occurs with a critical review gives a chance to jumpstart the presentation by providing an initial audience for the author.

Within the context of *Crossroads*, the attendees report that these pre-conference interactions have significantly contributed to their professional growth. Individuals were encouraged to take a bit of a risk with their writing and they seemed to respond accordingly because of the uncommon investment of care by the reviewers. The resulting work became more useful because the authors found ways to tighten their ideas even as the proceedings were better crafted for conference consumption. Furthermore, because the reviewers took the original author's writing seriously, there was an unspoken standard for clarity of thought within the written word as well as a tacit stipulation for clear central messages during the oral presentation within the scheduled conference session.

From the outside, the utility of critical review might seem obvious. Many of us have been the beneficiaries of careful and conscientious feedback about our writing, likely dating back to the days of a thoughtful mentor reading dissertation drafts. On the other hand, these forms of intellectual input are rare within professional development venues, including the comments received from reviewers on conference proposals. In fact, the writing genre for conference reviews typically serves more of a gatekeeping function (e.g., Villenas, 1996) rather than guiding or mentoring the author's efforts. Perhaps that is part of the reason *Crossroads* participants are pleased to read our responses, and why we are so surprised that they respond so favorably. Perhaps the innovativeness of "critical review" is not so much in its conceptualization but rather in the deliberate embedding of it into the professional development process.

2. Practice Community

At *Crossroads*, the written pieces that enable the critical review are structured as a "Vexation and Venture." A Vexation is posed first, and obliges the author to identify an aspect of the work that is troubling, often in a very personal way. The Venture nominates a blueprint for action with the potential to soothe the Vexation. The combination is verbally revealed during the Incubator sessions that take place around conference tables (for conferring!) that seat eight to twelve individuals. While we've described this elsewhere in greater detail (Settlage et al., 2007; see also www.sciedxroads.org), the sequence of the session is: (1) an individual has a few minutes to tell the polite group about a Vexation and Venture, (2) the group asks the individual some clarifying questions and (3) the group converses about the work while the author sits silent. During this third phase, the group cannot expect nor allow the author to offer any new contributions. Having a facilitator present helps keep track of the time and sometimes provides stern reminders about who can and cannot speak. This tight control over times and voices turns out to be essential. It fosters a unique climate that, because of its restrictiveness, frees individuals to pay attention to the specific tasks at hand, such as clarifying, conferring, and even listening in a mindful fashion.

In a search for a theoretical framework to explain what was taking place, we began playing with the structure of *Communities of Practice* (Wenger, 1999). What we found is that even though this framework seemed to hold promise, in the end it was a poor match for what occurs within *Crossroads* (Settlage & Johnston, 2008). At the same time, the "community" component was shining through as a key feature, despite the lack of a desire for generating shared products by the members of the community. The group conversation is focused on individuals, rather than on group initiatives. But even within these discussions, the idea of scholarly activity (e.g., Lieberman, 1992) seems to unify the underlying intent of the members of the community.

We call this small group gathering a "practice community" for multiple reasons. Yes, it's a clever (in our minds) twist on "communities of practice." More importantly, we're trying to represent how we bring together a temporary community around a table, "practicing" in both senses of the word – a rehearsal of a new possibility in our professional lives and the

regular performance of the best within professional selves. The community around each table is temporary but creates meaning that is received explicitly by the presenter and by other individuals as well.

We have been pleasantly surprised that this community built around a conference table extends beyond the confines of a single room. In fact, as individuals interact with different sets of people at different conference tables, particular conversations begin to bind and define the greater community. Supporting this have been our deliberate efforts to hold keynote addresses, townhall meetings, and even poetry readings to bring cohesive themes to the group. Other group gatherings rely upon panels of “experts” to address the group; these have almost always left us unfulfilled and disappointed. In retrospect this makes sense: The practice community benefited from a unique locale and special moments in which to unite the attendees. Unifying the community, while not something that could occur at the expense of small group conferring, was an important step towards building shared commitments and finding greater overall purpose in our work.

3. Joint Responsibility

The community is not simply something consisting of members, and should not be forced to coalesce for its own sake. Members of the group must exhibit responsibility for one another and their unique individual endeavors. This is something we had intended from the start of the design of *Crossroads*, but still found it remarkable that within the group there is a continual sense of joint responsibility – the responsibility of the group for each individual and that of the individual for the group.

There are clearly two faces of this mirror. First, and perhaps most obvious, the members of the group are responsible to individuals offering their work. This takes several forms. In critical review, the author is responsible to the reviewers and vice versa. In the incubator forums where the work is presented and commented upon, the group at the table needs to respond and offer feedback to the presenter. This is made especially clear when the presenter is sitting there, forced to be silent. The responsibility for discussion is then transferred from the person bringing the work to the table to those who, at least in other contexts, would be viewed as the recipients of the work. In this case, they give back to the presenter. As everyone at *Crossroads* has the duty of presenting work, the community recognizes the responsibility that they each have to one another.

Additionally, the group has taken on a sense of responsibility to something greater than the group or even the conference setting. A defining theme of *Crossroads* has been reaching beyond the group to communities, either local or more widely construed. This is reemphasized in keynote addresses at the conference, at the critical review level, and even around the table. Individuals are presenting work that is only just beginning, and develops importance reaching beyond the production of an interesting paper.

The works of individuals receives beneficent input from the group. Further, there have been subsequent individual efforts (that have began as *Crossroads Ventures*) that indicate that there is a nurturing aspect provided by the collective. This is a facet of the conference and its interactions that we hadn't anticipated in any form. While we always intended for individuals – selfishly including ourselves – to benefit from inputs about solo projects, we hadn't foreseen that the group itself would spark a direction and purpose for new work in real, local contexts. Not only does this manifest itself in our colleagues' works (working on state curricular standards, seeking out new career paths, and crafting new research frameworks, to name a few), but also in our very own. John now is working to craft graduate program partnerships that extend beyond his own university's pastures; Adam has taken on new summer outreach programs that he never would have dared without the bravery instilled upon him from others in the community. It has been exciting to see that our work is still our own, but nurtured and dared to be made real by the cohort.

FOCUSING UPON FRAMES AS ONE MOVES FORWARD

The three guiding principles represent important aspects of our particular practice and development. Again, we don't pretend to know that these are the ultimate and essential pieces to all professional development. They have, however, provided a crucial frame for our professional development initiatives. Along the way, the principles have been helpful in making decisions about adjustments to the *Crossroads* conference. Without these principles, all of our efforts would be analogous to the square yellow notes stuck to a computer monitor. Each contains the nugget of importance and inspiration, but lacks proper placement and permanence.

We have learned that we cannot create a professional development opportunity out of clever tricks, new technologies, or other gimmicks. In fact, the Incubator along with the Vexation and Venture features would be novelties without a more deeply grounded foundation. Looking at the many programs and projects of our colleagues, we recognize other possible frameworks, but also missed opportunities to more clearly understand what we are doing. This is apparent within daily encounters and exchanges at our own institutions and in the work that we undertake in other contexts. We could do much better at relying upon frames as a consistent tool for shaping our work. We also consider broader initiatives in professional development, such as national conferences, workshops, and partnerships and speculate how these larger and wealthier organizations might operate differently. A professional association that grows in numbers and dollars as it becomes more established becomes more likely to neglect important opportunities if they become overly concerned, for example, with how many conference sessions to run concurrently, rather than the central purpose and principles of the organization as it expands. Likewise, we could all do well to consider the more local graduate program, teacher preparation curriculum, or even individual research program to see if these are framed coherently, or just remnants of a once clever idea left sticking to a wall.

This is our point: in all that we do, we must understand what we are trying to accomplish, envision where we would like to be going, and identify the guiding principles we should be using. We have found this to be not only useful in describing and shaping our work, but in helping us find delight and longevity in our efforts. We hope that others can be so fortunate.

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