

If We Believe in ALL, Then What Ought we be Doing

A success... Merging views the ideal science learning community with the reality of life in schools

A common criticism voiced by novice teachers and pre-service teachers during their internship/student teaching experience is that education/science education courses did not prepare them for the realities of life in schools. As educators we often fall into the trap of highlighting and focusing on reform-based teaching pedagogy and curriculum materials. Our new teachers often enter classrooms and school communities that focus on student achievement on standardized tests. This prompts them to look back on their teacher preparation and say things such as, “Those courses were a waste of time, I didn’t learn anything in them. I learned everything I really needed during my student teaching and my first few years of teaching.” This mentality about how one learns to be a teacher is often reinforced by the peers, colleagues and supervising teachers or administrators.

The science education community has made strong strides toward instilling the idea of life-long learning and reflective practitioner. Gone are the days when teacher think that after the first couple of years they will have all of their lesson plans written. Teachers accept that fact that instruction must change and adapt based on the students and changing community needs. As a community we are moving toward a model of mentoring new teachers and providing structures for action research and professional development that support a teacher throughout their career.

The disposition of life-long learning and reflective practitioner is fostered and supported in science methods courses through the use of strategies such as: case studies, lesson presentations and analysis, action plans, action research, field observations and teacher interviews. A brief description of each of these strategies is provided below.

- The addition of case studies, both written and video, have expanded in science methods courses the last 15 years. Case studies allow pre-service teachers to wrestle with classroom situations in a safe and protected environment with a community of learners who can brainstorm a wide variety of approaches. It also allows access to setting that may be very different from what they have experienced in their own schooling, or that are available in the area surrounding their college campus.
- Lesson presentations and analysis either to peers or in the field provide opportunities to practice teaching a lesson, but then also take the time to reflect back on the experience and examine what worked well, and what didn’t work well. This pushes the teacher to think through what shaped the interaction and brainstorm alternative actions. Capturing these lessons on video allows a teacher to revisit the lesson to focus on different aspects of the presentation and class interactions. Having peers role-play various common student attributes during a lesson allows the novice teacher to experience the challenges of a teaching in a diverse setting in a supportive environment. They learn about their tolerance for chaos and get a chance to think through options for the next time they encounter a similar situation.
- Action plans help a novice teacher realize that they will not learn everything during their coursework. It sets them up to plan for the future, for example: How to support students with learning disabilities? How to deal with controversial issues in the classroom? What goals for learning do they have past graduation?
- Action research allows teachers to take a classroom-based question and pursue it with a learning community. It reinforces the idea that teachers are constantly exploring and reforming their practice.

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- Field observations and teacher interviews allow the class to encounter a variety of teaching settings and student populations. By sharing these in the methods course multiple perspectives can be explored.

These strategies represent a few of the ways that as a community science educators are merging theory and practice. We have moved past preaching to our teacher education candidates about how they should teach and what they should teach toward actions that allow us to mentor them and provide support as they become our colleagues.

A vexation... Science for All? I don't think so...

In 1989 the American Association for the Advancement of Science first published “Science for All Americans.” Sixteen years later are we really any closer to our goal of science literacy for all students? We are now approaching a quarter of our way to that magic year of 2061. What has changed since this report? As a community we are forced to ask ourselves a few questions such as: How have schools and our education systems changed? What connections have the science community made with the mathematics community and communities tied to technology? What role has the move toward national standards and legislation such as “No Child Left Behind” played in making science accessible to all students?

As science educators we try to infuse the ideas behind “Science for All Americans” into our methods courses and our work with practicing teachers but this is often limited to a superficial treatment of these issues. What would our methods courses look like if we truly embraced this goal? As a community we have not taken on the task of developing science curriculum materials that teachers and communities could use to promote these ideas. Some individuals have started developing such materials, but these materials have not made it into large numbers of K-12 schools. In general – what should these materials look like and what image of science should they present? For the most part the science education and science community have not built strong bridges – how can we expect to build bridges with other communities and move toward a goal of science literacy by 2061? Few members of our community have tried to work in the political system to make the structural changes needed in schools to move forward on these goals. What are we doing as a community to move toward this goal other than cite the work in our papers and articles as a justification for our research and practice? Is this truly a goal for science education – or is it time to admit that we like the rhetoric but it is not an attainable goal? Is this really a goal that we want and need to all work toward or will it fade away like the science education goals of the past decades?

The questions posed above are theoretical, philosophical and problematic in nature. So in an attempt to break the issue down into manageable “chunks” and to put the larger goal of science literacy for all students by 2061 in place here are some additional questions to consider:

- What are some short-term attainable goals that would move us toward this goal?
- How should we prioritize these goals? Or how should we delegate these goals out to subgroups of our community?
- What other communities need to be courted and included for us to succeed in this goal?
- Can we set a timeline of goals for the next 5 years? 10 year goals? 15 year goals etc.?