

## TAKING ACTION IN SCIENCE EDUCATION

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### Vexation

Well here I am again, one year later with the same question I proposed during the 2007 Crossroad's Conference in Amherst. At the risk of sounding like a broken record (and this tells my age), I am still asking, "now what?" However, this year, I have a better direction as I ask that question. That direction involves taking action in science education. The vexation, however, is how I can take action, to also motivate others to take action, and create a shared urgency within the science education community.

Decision-making and action-taking within the community are not necessarily encouraged or promoted in grades pre-K – 16 and beyond. Action-based strategies such as **service-learning, civic involvement, and community stewardship** offer opportunities to apply science content and scientific skills in order to make a difference with people, within the community, or within the world.

**Service learning** involves a learning process where students contribute and provide a service to the community while the community in turn provides a service back to students and schools. This type of project results in reciprocal learning and partnerships. Specifically, service-learning assignments are ones in which students provide a community service outside the four walls of the classroom and address a community need. Kaye (2004), known for her expertise in service-learning outlined essential elements of service learning projects. These elements include:

- Integrated Learning
- Meeting Genuine Needs
- Youth Voice and Choice
- Collaborative Efforts
- Reciprocity
- Civic Responsibility
- Systematic Reflection

The KIDS (Kids Involved Doing Service) has described three basic components of service learning:

1. **Academic Integrity** – Service-learning projects are linked to state content standards.
2. **Apprentice Citizenship** – Students take roles as valuable members of the community and partner with community groups to take action and make a difference.
3. **Student Ownership** - Students are encouraged to make decisions during the learning and problem solving process. Teachers and community members facilitate the process, but the students actually guide decisions being made.

**Stewardship** is closely linked to service learning and includes the call for responsibility to ensure welfare of the world and in the world. This can include environmental conservation, human rights, economic welfare, education, health care, disaster relief, and animal welfare. Stewardship can include individuals or groups working together to obtain greater peace and sustainability throughout communities everywhere. Stewardship is closely related to place-based education that involves students and teachers with nature-based learning that connects them with their community. With place-based education, teachers are encouraged to leave the four walls of the classroom and help students investigate the world around them. Stewardship and place-based learning include cumulative efforts of individuals or groups that results in positive outcomes for the environment. Stewardship, therefore, is the moral obligation to care for the Earth, its people, animals, and resources so that it may be preserved for future generations.

**Civic Involvement** is a part of service learning and stewardship but is organized specifically to encourage active community members. Ketter, Zukin, Andolina, and Jenkins (2002) describe civic involvement at incorporating three different areas: Civic Activities, Electoral Activities, and Having a Political Voice. Civic activities improve the community or help local individuals. Such activities include volunteering time or a service, joining a civic organization, or supporting fundraising efforts for a particular cause. Electoral activities include voting, persuading others to vote, and volunteering for a government initiative or candidate. Having a political voice includes writing or meeting with decision-makers, creating or supporting petitions, and protesting.

Westheimer and Kahne (2002) provide a framework that distinguishes between three different types of participatory citizenship projects:

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Personally Responsible	Participatory	Justice Oriented
<ul style="list-style-type: none"> <li>■ Acts responsibly in community</li> <li>■ Works and pays taxes</li> <li>■ Obeys laws</li> <li>■ Recycles</li> <li>■ Volunteers</li> </ul>	<ul style="list-style-type: none"> <li>■ Active member of community organizations</li> <li>■ Organizes community efforts to care for those in need</li> <li>■ Knows how government agencies work</li> <li>■ Knows strategies for accomplishing collective tasks</li> </ul>	<ul style="list-style-type: none"> <li>■ Critically assesses social, political, and economic structures to see beyond surface causes.</li> <li>■ Seeks out and addresses areas of injustice</li> <li>■ Knows about democratic social movements and how to effect systemic change.</li> </ul>
Contribute to a recycling bin at home, work, school	Work with the community to create and organize recycling bins at home, work, and school; monitor the progress of the project	Gather info about why people do not recycle, create a plan to encourage recycling, make public announcement about recycling, and report on the progress of the project
<b>Traditional classroom projects</b>	<b>Service-learning and Stewardship projects</b>	<b>Civic Involvement projects</b>

So, by now you're probably thinking that these ideas might sound a bit like a, uh, a broken record—the one that Joni Mitchell sang, *Big Yellow Taxi*? Or, maybe it's a more current version from Melissa Etheridge's *I Need to Wake Up* from the Oscar winning documentary, *An Inconvenient Truth*. Yes, the connotations are the same, "Save the people, save the animals, save the plants, and save the world." When I gave a presentation at a local university to encourage more action-based projects in science methods courses, one of my colleagues, in his most endearing voice, asked me, "Amy, isn't this a little like the 1970s and haven't we been here before?" My response was, "Of course, but what is the purpose of teaching science and learning science if students are not applying it in some way?" The reality is that most of our students will not be scientists or even enter STEM careers. So, why are we teaching science (besides the fact that the curriculum requires it K-10 and universities have specific science prerequisites) if not to make a difference within our communities and the world we live in?

## Venture

My venture, therefore, is to encourage more action-based strategies within science methods courses and within the pre-K-12 science curriculum. During the conference, I would like to discuss these ideas and gain valuable feedback from my colleagues related to ways that I can encourage and enact more service-learning, stewardship, and civic involvement. Maybe it will be, dare I say, a grassroots venture?

So how does all of this fit with the conference theme, *Situation Recognition*? Well, first of all, this is personal, not driven by the institution or by the curriculum. And secondly, this is a topic that I am passionate about and committed to working on for many years. I am eager to have conversations with colleagues at the Crossroads Conference about how I might proceed in enacting my passion.

Jean Lave and Etienne Wenger (1991) are known for their work, ***Situated Learning: Legitimate peripheral participation*** where they view learning and community as a social activity that develops from multiple experiences and different types of participation. We all partake in activities based on our home, community, and school. However, we have varying roles within each of these areas. At times we are at the core of the activity, and at other times we are on the peripheral. During science instruction, many students stay on the peripheral because they feel that they cannot "do" science or they feel that they have difficulty applying science content and skills in their world. For this reason, it is important to connect science content with action-based initiatives so that all students can view themselves as part of the scientific world.

## A final note

During the 2007 conference, I wrote, "At the end of my career as a professor, I want to look back and see myself as a person who has made a real difference in creating equitable access for students, their families, and education." I think that taking action within science education and encouraging more service-learning, stewardship, and civic involvement, may be at least one way that I can accomplish this. But, I need your help. So, I am looking forward to discussing how I might accomplish this venture based on the words of Melissa Etheridge: "I am not alone, I am my intentions."