



teacher in a Northeast Portland middle school and myself, a long-time environmental educator turned doctoral student. Our goal is to empower students to make connections between personal knowledge and environmental learning in ways that promote participation and learning in science class. To be responsive to the students' interests and to facilitate our own continual learning, we use the model of action research - a spiral process of planning, implementation, evaluation and re-planning. The general approach of our plan-as-we-go curriculum is to get students involved in learning about and acting on community environmental issues of their choosing.

Community-based or place-based programs share our emphasis on the local context but few programs that we have read or heard about turn power in the classroom over to the students. In my first years of teaching environmental education I spent a lot of energy trying to get the students to understand and adopt my (enlightened) environmental perspective and absorb my (considerable) scientific expertise. Historically much of the environmental education curriculum and research does the same:

it focuses on either 1) carefully planned and tested activities designed to encourage the adoption of environmentally friendly behaviors that are pre-determined by the teachers and researchers, or 2) packaged units on environmental knowledge designed to be easily fed to the cooperative (but passive) student.

It was working with Native American, poor European American and African American students that helped me to shift towards student-centered learning. Approaching urban and minority students with my standard nature-as-wilderness bag of tricks was simply not working. Slowly, I began to do more listening than talking and to adapt my teaching to the particular needs and interests of the students and their communities. Now I know that to make environmental and scientific fields more diverse and to teach effectively to underserved populations I have to drop my agenda and listen to theirs. Particularly for populations such as urban, low-income African American and Latino students, who historically have not had a voice in scientific and environmental fields, honoring student knowledge and empowering student decision-making in the curriculum is crucial.

Graffiti, Homelessness and Asthma: Facilitating Student-Powered Urban Environmental Education

Giving students the power to design their own method and meaning for studying community-based environmental issues

by Shamu Fenyvesi Sadeh

If students were asked to define "environment" and "community," what would they come up with? What would it look like if students designed their own methods for investigating community environmental issues? What would it mean if the teacher encouraged students to make connections between what they know about their neighborhood and scientific concepts such as diesel particulate pollution and carcinogens?

These are the central questions guiding a collaborative research and teaching project between an eighth-grade science

The Community Environmental Health Project at Columbia Middle School

In our work with low-income African American, Latino, Asian and European American middle school students, the collaborating teacher and I have worked hard to put the students' perspectives at the center of the classroom. For example, when we began this fall by asking students about environmental issues in their community we got a lot of confused looks and blank stares. We decided we needed to take a few steps back and have the students define the concepts we were using. We decided to start using the words like "neighborhood," "community," and "health," rather than just "environment," because we found that those words made sense to the students.

The discussion on "What is Community to You?" was one of several that delved into students' intense curiosity about race and poverty. Why is it as one student, Devon, observed "On this block we got Mexicans, on this block white, on this block black."

Why is the majority of industry located in minority neighborhoods? These were some of the liveliest conversations we have had in class this year. Few off-the-shelf environmental education curricula, even community-based programs, address race or class. Yet we found that culture, race and class are central to the students' experience of community issues and are, of course, central elements in the field of environmental justice.

As a way of generating excitement on an issue close to the student's experience, we read an article on the building that housed our school just four years ago. Many students in the class had older brothers and sisters, cousins or even parents who had attended school in the old building. The article describes how the building was contaminated with high levels of radon and toxic mold for many years. However, most shocking were three facts in the article: 1) radon and toxic mold exposure causes severe headaches and a lowering of cognitive abilities, 2) students at this school had the lowest test scores and among the lowest attendance rates in the entire state, and 3) some school district officials knew for many years about the radon contamination and did nothing, despite repeated complaints by students, parents and teachers.

Many of the students were shocked and some, angry. One student, Sara, wrote in response to the article "If they knew about it for so long, how come they didn't tell nobody or do anything?" The article showed students that there are important environmental issues affecting their community, introduced the concept of environmental justice, and in the words of the teacher, "got them riled up!"

After helping students to find their homes on city maps, we decided to engage in some neighborhood investigations at a scale that makes sense to the students: three block surrounding their house, apartment or trailer. From their observations, and from surveys the students designed and conducted in their neighborhoods, we generated a list of community issues. Homelessness, violence and graffiti were frequently raised together with more traditional environmental justice issues such as air pollution and asthma. Each class of students voted on an issue to investigate further and to take action on. Three classes chose air pollution and asthma and one class chose homelessness. Although homelessness and graffiti do not appear in scientific accounts of environmental problems, nor are they topics usually studied in science class, we decided to include them on the "community issues ballot" because they reflect student and community interest. If we want a science and environmental education that reflects the full diversity of our society, than we must expand the boundaries of "science" and "the environment."

Other activities we have done as part of the community environmental health project include: writing a scientific autobiography, conducting community surveys, dialoguing with guest speakers, taking field trips, watching a video on pollution issues in a San Francisco neighborhood made by middle school students, conducting a lichen (as air quality indicators) survey, and making presentations to 6th and 2nd graders.

Challenges

Accommodating the time demands of this way of teaching and learning is not easy. Since the students design their own assignments and choose projects to work on, the teacher and I cannot plan the curriculum in advance. Additionally, our community investigations involve lots of reading and group work that

demand lots of class time and need to be balanced with other 8th grade science units. Moving from teaching as telling to teaching as finding out requires a huge shift in thinking that posed a challenge to both myself and the teacher. This shift involves letting go of control and expertise and leaving room for mistakes and uncertainty. From my experience in environmental and science education, this is the path that all of us, whether college professors, nature center naturalists, or middle school teachers need to take.

Shamu Fenyvesi is a graduate student at Portland State University, in the Center for Learning and Teaching West (NSF). The co-authored the article on Meeting the Needs of Underrepresented Populations in Clearing #115 (Spring 2004) with Dr. Bonnie Sachatello-Sawyer.

A Little of What Have We Learned

Although we are still deep in data analysis, evaluation and reflection, a few patterns and lessons have emerged from the last year.

- The Community Environmental Health Project is seen by some students as exciting and "real" compared to the usual school work of "sit and listen," "facts" and "books."
- Many students who were typically unmotivated by science class emerged as energetic and vocal participants in the community environmental health project.
- Many students were able to make personal connections to science through observations they made in their daily lives, conversations with neighbors and family, concerns about justice, and feelings of compassion for those suffering from asthma, cancer, lead poisoning, or homelessness.
- Students showed understanding of concepts such as: the health effects of environmental toxins, using lichen as air quality indicators, environmental justice, mapping, community activist resources, and the effects of personal choices on environmental health.
- Students' comments and participation in extracurricular activities related to the project (producing a youth radio show for local community radio) demonstrate the empowerment many students feel being part of the project.

When a normally shy student proclaims "I want to know what it is like to be a homeless person," and another confides to me that she likes studying air pollution because "my friend has asthma and I can cure her," and a third tells me "So now that I see these things around me, all this air pollution, I know what to name it cause before I didn't really pay attention to it," we feel good about the work we have done.