

## *Addressing the Complexity of Teaching Training Teachers Through a Social and Environmental Lens*

This is my first foray into explicitly addressing social and environmental justice issues in my teaching and, I have to admit, I do not have a super high comfort level with the application, theories and perhaps even the terminology in this field. I look towards my participation in the workshop as a learner, to expand my thinking and teaching towards a social and environmental justice lens. I would submit that throughout my teaching I have haphazardly and tangentially encouraged my students (who have been mainly pre- and in-service elementary teachers) to consider the broader implications and perspectives of science learning and teaching. This includes both seeing the wider applications of science practices as well as how science has had beneficial as well as destructive impacts on society, especially for certain groups.

My more direct interest in social and environmental justice in science teaching has been stimulated by a recent move to Oregon State University and participation in the research project [Addressing the Complexity of Teaching \(ACT\)](#). I am collaborating on this project with Drs. SueAnn Bottoms, Kathryn Ciechanowski and Emily van Zee. One of the project's fundamental goals is to inject a social justice perspective to the science training of K-5 pre-service teachers, including environmental issues. The model for ACT is to develop a sequence of science content, science methods and language learning classes that have coordinated content, clear connections

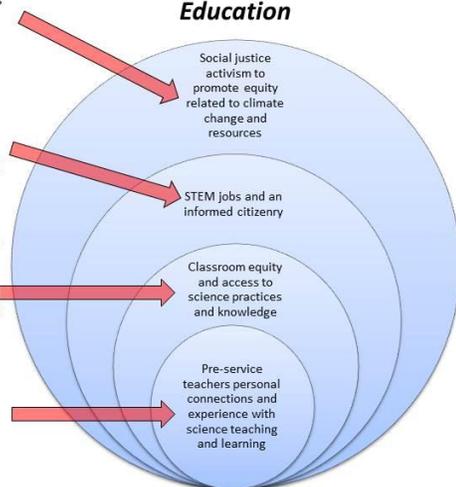
Civilization is confronted by unparalleled change occurring at a rapid rate. Population growth, allocation of resources and global climate change combine to present significant challenges and opportunities. This is a social/environmental justice issue – environmental change will be unevenly distributed adversely affecting poor communities and those with limited political and financial resources.

Citizens require math, technology and science knowledge and skills to flourish in a growing interdependent world where jobs require specialized training, knowledge and skills. This is a social justice issue since minority populations are not provided STEM learning opportunities that are required to adapt to rapidly changing job markets.

With teachers unprepared to teach science content and practices students are denied high quality science instruction. Decrease in time spent teaching outside of math and literacy areas also has decreased time and quality science instruction. This is a social justice issue circling around lack of equity and access to quality science instruction.

Many K-6 teachers are generalists, they teach all content areas. Knowledge of science content and practice is required to teach effectively. Many K-5 teachers have negative or no experience in learning science and therefore may not be effective teachers of science or avoid the topic all together. This is an issue of social justice; teachers are not gaining access to learning experiences consistent with their backgrounds and professional needs.

### **Social and Environmental Justice Impacts for Science Education**



to science practices and a consistent lens of teaching for social and environmental justice. As part of our work we have developed a preliminary model for social and environmental justice impacts for science education (diagram to left). The impetus for development of this model was our reflection on the enormity of the task of not only training pre-service teachers to teach science but provide them experience, tools and background to teach with a broader social and

environmental justice lens. In our model attaining the higher levels of social and environmental justice (the larger circle of activism) require changes at grassroots levels in teacher training. This starts with training teachers through experiential learning experiences that are not based on a deficit model of teaching and learning. More students benefit when K-5 teachers are prepared to confidently and competently teach science that enhances potential entry into science and technology positions, especially for underrepresented populations. With more science knowledge and habits of mind these students have higher science literacy potentially leading to more access science and technology careers as well as citizenry capable of understanding and addressing complex issues, including environmental issues such as climate change and resource

management. The final model level is activism. Within this mode people act through voting, participating in campaigns or acting on local levels to mitigate the inequitable effect of, for example, environmental issues. A strong educational foundation of all disciplines and an awareness of social and environmental justice issues are required to more effectively operate on this level.

I end this essay with some nervousness about the validity of some of the ideas and their application to this workshop. The model and essay are clearly a work in progress and I look forward to sharing some of these ideas with more informed workshop participants. I suspect that some (many, most?) of the ideas in the model and essay have been more fluently and eloquently articulate elsewhere. And perhaps there are gaps and errors in the model. For example, does environmental or social justice activism “require” a strong educational foundation of science taught through a justice lens? This is probably not true for all individuals; but I would submit that high fluency in science content and practices, and strong writing and oratory skills are required to be effective. Although I am a new entrant to both social and environmental justice issues, models, theories and pedagogy I am committed to pursuing some aspect of this path in my future work with teachers.