

Schools/Citizen Science

A Response to “The Future of Citizen Science”

Matthew Weinstein

ABSTRACT

This paper builds on Mueller, Tippins, and Bryan’s paper to ask how neoliberal restructuring impacts the form of appropriate and possible democratic science/education. It examines the compatibilities between antidemocratic tendencies of current schooling and common forms of citizen science. It also clarifies several details regarding the street-medic movement. The paper suggests that distinguishing between democracy as participation and democracy as opposition would help clarify the appropriate forms, limits, and possibilities of democratic forms of science in schooling.

This article is a response to:

Mueller, M.P., Tippins, D., & Bryan, L.A. The Future of Citizen Science. *Democracy & Education*, 20(1). Article 2. Available online at <http://democracyeducationjournal.org/home/vol20/iss1/2>.

MUELLER, TIPPINS, AND Bryan (2012) offer up compelling criticisms of extant citizen science and provide hints of alternatives to it. In this response I want to complicate, broaden, and realign their analysis in several ways, ways that at base insist that the key terms and presumptions of their analysis be placed in the larger shifts and practices of neoliberal globalization that are transforming the dominant definitions of science, democracy, and education. I start by noting aspects of their analysis that strike me as critically important and that teachers, science studies scholars, and teacher educators should attend to. Even in noting a few of their many essential points, I try to point to the larger economic and political context that shapes and troubles their inquiry. In the end, I argue that the pairing of citizen science and education should not be read as a failed attempt at democratizing education but as a romantic pairing of institutions that are discomfotingly undemocratic, and I suggest that a radically different attitude is needed to move forward toward our shared goal of democratization of schools and science.

As the paper’s authors note, citizen science is primarily a means of recruiting non-scientists into the labor of generating data. Their role rarely comes close to full participation in the cycles and stages that constitute scientific labor. There is a part of me that wants a full-on Marxist analysis of citizen science as mass exploitation via outsourcing. But my colleagues also capture another side, a side rarely remarked upon but that has been evident to me as well: strong feelings of love and appreciation between many citizen scientists and the enterprise community they are serving

(Weinstein, 2011b). Part of that love is tied up with the exceptional status of science, what the authors call *scientism*. Scientism leads to a romantic conception of what science is, which motivates many to become involved in citizen science projects. Science in scientism is a cosmology apart, not one among many. In the past, science’s higher standing has been enshrined in law: Science has a special status for settling disputes in GATT (General Agreement on Trades and Tariffs), the international treaty that laid the groundwork for economic globalization, for instance. But science here and elsewhere has to be understood as evoked by convenience. The corporate entities behind GATT saw science at least partially as something that would legitimize the corporate power behind the treaty and limit democratic resistance (e.g., in disputes over GMO labeling, or other instances where resistance was pursued through “the precautionary principle” [Winickoff, Jasanoff, Busch, Grove-White, & Wynne, 2005]).

MATTHEW WEINSTEIN is a professor of science education at the University of Washington-Tacoma. He is author of two books: *Robot World: Education, Popular Culture, Science* and *Bodies Out of Control: Rethinking Science Texts*. His work examines science in the public sphere through the lenses of anthropology and cultural studies. Acknowledgements: Thanks to Ken Tobin, Catherine Milne, and the team behind the CSSE Forum, which provided a key forum for research on street medics.

The current acceleration of neoliberal restructuring in the United States, both at national and state levels, has diminished enterprise science's exceptional status. Current moves to limit the Environmental Protection Agency's (EPA) role in protecting air quality, to "drill, baby, drill," as Sarah Palin famously quipped just before the (now) seemingly forgotten Gulf Coast oil disaster, and to force religious dogma in science education curricula mark a real shift, along with the decimation of the public sector's rights and numbers, toward drastic marginalization of democratic space. As Harvey (2005) noted,

Neoliberal theorists are, however, profoundly suspicious of democracy. Governance by majority is seen as a potential threat to individual rights and constitutional liberties . . . Neoliberals therefore tend to favour governance by experts and elites. A strong preference exists for government by executive order and by judicial decision rather than democratic and parliamentary decision-making. (p. 66, emphasis mine)

Expertise for neoliberal reformers, however, has to be understood as highly prescribed. In fact, a lot of expertise is inconvenient to those leading the neoliberal restructuring. Rather, all forces that interfere with raw profit taking seem to be disposed of as ethically and politically inefficient, positioning science itself as often an obstacle (which too frequently raises issues of climate change, environmentalism, etc.), even while profit in key sectors (biotechnology, big pharma, oil) remain heavily dependent upon technoscience.

All of this is prelude to Mueller, Tippins, and Bryan's main argument that citizen science does not go far enough as a vehicle for democratic science (in schools). But are schools (writ unitary) interested in science as a form of democratization? Does democratic practice in one sphere (say, science) lead to transformations in another (say, schools)? In this historic moment, what does democracy look like in the rapidly neoliberalizing Organisation for Economic Co-operation and Development (OECD) countries? When I read their article, I wanted the authors to situate democracy, science, and science education within the larger political economy. Schools here (the United States/North America) are being driven by high-stakes testing and worker production (Achinstein & Ogawa, 2006; Apple, 2010; Bencze, 2010) and disciplined with closure and privatization through No Child Left Behind (NCLB) punitive measures, and Race to the Top funding has created a cyberpunk educational landscape of technocratic control and fear (Giroux, 2009; Weinstein, 2007). Democracy in such a culturescape has to look more like opposition than participation (à la citizen science), I suspect.

Mueller, Tippins, and Bryan turned to my study of street medics (2011a) to suggest one concrete possibility of what a more thoroughly participatory citizen science might look like and, given the medics' enabling of head-on resistance, it seems an appropriate model of oppositional democracy. In the civil disobedience that defined the 1999 WTO meeting in Seattle, which resulted in the second wave of street medicine (the first wave occurred in the civil rights movement of the 1960s), there was a constant chant of, "This is what democracy looks like" (Freidberg & Rowley, 2000). Street medicine is a network of lay and professional medical workers

(doctors, nurses, first responders) organized to support protesters in the heavily militarized protest zones outside meetings of the G20, IMF, and other neoliberal organizations. In my own research I have tried to distinguish the relationship between publics and enterprise science represented by citizen science from the more complex relationship of the street medics by calling the latter relationship *ciencia popular* (people's science), explicitly decoupling it from citizen science—though overlaps exist (Weinstein, 2011b). Four things characterize the *ciencia popular* of the medics: an a priori commitment to social justice, the emergence of the experts from the communities they serve, an easy exchange of roles between the medics and their communities (they will often drop their medical "markings" [crosses, caducei, etc.] and enter the protest fray), and a low bar of access by nonexperts to joining the community of experts. For the medics, science is not about providing a service to an "othered" community (as, for instance, is the case with Doctors Without Borders, which in many ways is a comparable organization) but is about solving a problem internal to the community of which they are part. Contrast this with most citizen science projects and the barriers to democracy become clear: The problems usually are not set from inside of a community that includes both the experts and the nonexperts; the roles of expert and nonexpert are not commutable (in the mathematical sense of exchangeable), and access to joining the role of expertise has a very high bar (credentialism).

Similar problems exist for embedding *ciencia popular* in schools. The networking and training of street medics happen outside and in resistance to the neoliberal sphere in which schools increasingly are integrated. Schools have no a priori commitment to social justice. Schools often do not represent self-identified communities of the type the medics participate in. Teachers and students do not spontaneously switch roles. Schools decreasingly have space for the type of pedagogy of time and place that a more democratic citizen science, or *ciencia popular*, requires.

Thus, the tensions and attractions between schools and citizen science projects are not so much about democracy, as I see them, but about parallel, and genetically related, hierarchical (nondemocratic) models: the first involving the teacher as the expert intermediary between the student and knowledge, and the second offering students direct access to the expert on whom the students are supposed to imprint. More specifically, schools and technoscience are entangled institutions. It is not so much *science and education as science/education*. The slash is borrowed from the conventions of fan fiction, i.e., stories written by fans of television, movie, and print popular culture that extend and bend the stories they love. Such fiction usually begins with a list of characters, and a slash in the list indicates that a given story features gay or at least homoerotic relationships among the characters with whom the fan-author is toying. My slash hints at a story about an uncomfortable relationship of technoscience and modern education systems. It is a discomfort that is connected to too much intimacy: overtones of incest, institutions of the same sex (however one sexes institutions), or other intimate practices that transgress and trouble categorical distinctions (e.g., heteronormality). Modern schooling is an attempt to embody science in the process of learning, though the

meaning of science remains contested within the range of school practices (Weinstein, 2004). Because of this kinship, both science and schools love progress, growth, expertise, and commodified knowledge. Both organize lives through relentlessly defined units of time and motion. Read this way, as problematic as the lack of democracy in all but the margins of citizen science may be for Mueller, Tippins, Bryan, and me, this is not viewed as a problem for neoliberal schools or top-down citizen science projects that find in each other attractive expert-on-top partners in the social construction of learning. This is why I have titled this response “Schools/Citizen Science.” There is love there, but democracy is not the issue. I suggest that the hope of democracy in citizen science and its subsequent incorporation into the classroom is a misrecognition of the nature of both institutions at the present moment—at least it seems so in the space-time I find myself.

If hope is to be found for a conjunction of schools, science, and democracy I think it is better to start with an understanding of the nature of life under neoliberalism. I have found Agamben’s (1998, 2005) work on the state of exception particularly helpful in getting a handle on this. He has tracked the disappearance of the civil state and the assumption of power by the executive or sovereign over time. This relocation of authority is done through various states of emergency or exception (justified through terrorism, war, violence, poverty, etc.). Street medics organized originally because doctors’ licenses were voided in the states of emergency declared around protests. They are creatures of the state of exception. Giroux (2009) has added necessary nuance to this, noting that in the United States the executive is not embodied neatly within government, but also in the corporations that the government ultimately represents. Also, the state of exception is not an all-or-nothing situation. While the United States exists in a technical state of exception since 9/11, for most there is some semblance of a judiciary, even as increasingly aspects of civil society disappear behind the wall of the exception (no-fly lists, national security letters, etc.). For others, the civil state is more or less gone, replaced by prisons and an armed, militarized police presence, particularly for those populations too poor or racially marginalized to be good consumers. Giroux has argued they are designated as disposable populations. I have shown elsewhere that within these zones social practices including technoscience become unstable and thus teaching science as though it universally works to students in these space-times is simply wrong (Weinstein, 2011a). Life is quite desperate in these circumstances, existence is reduced to what Agamben called “bare life” (1998).

In these circumstances schools cannot foster democracy as either participation or as opposition, since schools are appendages of the neoliberal state. I believe they can, however, serve as resources for continued survival. Thus, schools can ultimately enable more explicit opposition off school grounds. More than citizen science, community farming seems like it serves as the paradigm for this kind of curriculum. Albrecht and Upadhyay (2011) have reported on a project in Minnesota in which fifth-grade students on the verge of homelessness demanded that their teachers educate them about the growing of peas (food) rather than the other flowering plants they had originally planned to use, as

their survival depended upon their own food production. Their project clearly embodied a priori characteristics of *ciencia popular* also evidenced by the medics: easy access to expertise and exchange of roles (students provided a lot of the know-how in this project, including experience with germination from farm work). The other two characteristics were imposed by the students: a focus on community concerns, in this case food security and a focus on social justice (though the project started off with themes that were close enough, such as healthy eating and ecology, that when students demanded that the teachers shift focus the project, organizers happily agreed). This may not look like the cutting-edge technoscience of nanotechnologies, but it is a real place where science, schools, and democracy meet, and I would suggest a more relevant example as we try to craft an appropriate pedagogy of both “place” and “time,” i.e., a pedagogy directly addressing the differential zones of possibility in the current state of emergency integral to neoliberalism.

References

- Achinstein, B., & Ogawa, R. T. (2006). (In)Fidelity: What the resistance of new teachers reveals about professional principles and prescriptive educational policies. *Harvard Educational Review*, 76(1), 30–63.
- Agamben, G. (1998). *Homo sacer: Sovereign power and bare life*. Stanford, CA: Stanford University Press.
- Agamben, G. (2005). *State of exception*. Chicago: University of Chicago Press.
- Albrecht, N., & Upadhyay, B. (2011). *Vanilla, strawberries, and school garden: “I can show you how to pollinate the flowers.”* Paper presented at the National Association of Research on Science Teaching, Orlando, FL.
- Apple, M. W. (2010). *Global crises, social justice, and education*. New York: Routledge.
- Bencze, J. L. (2010). Exposing and deposing hyper-economized school science. *Cultural Studies of Science Education*, 5, 293–303.
- Freidberg, J., & Rowley, R. (Writers and Producers). (2000). *This is what democracy looks like* [DVD]. USA: Big Noise Films.
- Giroux, H. A. (2009). *Youth in a suspect society: Democracy or disposability?* (1st ed.). New York: Palgrave Macmillan.
- Harvey, D. (2005). *A brief history of neoliberalism*. Oxford: Oxford University Press.
- Mueller, M. P., Tippins, D., Bryan, L. A. (2012). The future of citizen science. *Democracy & Education*, 20(1). Article 2. Retrieved from <http://democracyeducationjournal.org/home/vol20/iss1/2>
- Weinstein, M. (2004). Science/Education. In J. A. Weaver, K. Anijar, & T. Daspit (Eds.), *Science fiction curriculum, cyborg teachers, & youth culture(s)*. New York: Peter Lang.
- Weinstein, M. (2007). We are already owned: What are the resulting implications if we continue to treat curriculum/teaching theory and practice as separate domains of academic research? *Curriculum and Pedagogy*, 4(1), 53–60.
- Weinstein, M. (2011a). *Invited Address: States of emergency, zones of civil disturbance, and sciences for “badly” behaving subjects*. Paper presented at the CSSE Springer Forum, Orlando, FL.
- Weinstein, M. (2011b). *Street medicine: A case study of articulations of technoscience, education, inquiry, and social justice in non-school settings*. Paper presented at the meeting of the National Association of Research on Science Teaching, Orlando, FL.
- Winickoff, D., Jasanoff, S., Busch, L., Grove-White, R., & Wynne, B. (2005). Adjudicating the GM food wars: Science, risk and democracy in world trade law. *Yale Journal of International Law*, 30, 81–123.