Interdisciplinary Study of the Local Power Plant: Cultivating Ecological Citizens

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People rely on power plants to generate the electricity needed to run much of their lives. Power plants, though, are typically not the domain of the average citizen. Even if they stand near homes, schools, and other important places, the operations inside, not to mention the many social and environmental impacts outside, largely lack the scrutiny of most citizens. Is this a problem, especially when some governmental oversight already regulates the plants’ operations? The National Council for the Social Studies (NCSS) defines the main purpose of social studies education as creating effective citizens. This article describes an interdisciplinary unit of study by middle-grades youth about a proposed power plant in their city of Lansing, Michigan. It shows students scrutinizing the complex power plant issue through a variety of experiences and from different angles. While supporting NCSS’ stance on the teaching of citizenship, we call for a conception of citizenship extending beyond human communities and structures to the community of the earth and all living beings. We also encourage social studies teachers to take up the work of teaching for ecological citizenship.

*Key Words*: Citizenship, Ecology, Ecological Citizenship, Interdisciplinary Education, Social Studies Education, Socioscientific Inquiry

**Introduction**

Ten-year-old Jana sat back in her chair and thought about the question she had been asked: should her city—Lansing, Michigan—build the proposed 70% coal-burning, 30% biomass-burning power plant? A member of the Lansing Boys & Girls Club and a participant in an interdisciplinary afterschool program there called GET City, Jana had been studying energy production when Lansing made public a plan to build a new power plant. “It could be good because the plant could give people jobs,” she offered. After all, the percent of unemployed workers locally and across the state had been hovering in double digits for some time. Then she quickly added, “but it could still pollute the air. How come it can’t be 70% [biomass-burning] and 30% [coal-burning]? Or how come we can’t just burn biomass instead of coal?”

We think Jana’s questions—as they implicate multiple, diverse perspectives and reflect an awareness of the importance of the health and sustainability of all life—signal her developing sense and skills of a form of citizenship that we call ecological citizenship. Here, focusing on Jana and her peers’ exploration of Lansing’s proposed power plant, we argue for the teaching of ecological citizenship in social studies education. We begin by exploring some of the citizenship education literature and calling for a reformulated conception of citizenship that extends beyond human communities and structures to the community of the earth and all living beings. We then discuss energy production while arguing that we, as a society, need to expand the purview of
power plant decisions from experts to include citizens, locating expertise in each citizen. From there we tell a story of the interdisciplinary unit of study in GET City about Lansing’s proposed power plant. We conclude by encouraging all teachers, and particularly social studies teachers, to take up the interdisciplinary, cross-curricular work of teaching for ecological citizenship.

**Citizenship Education**

The history of American schooling is a history of citizenship education (Cremin, 1980, 1988). Indeed, one of the central purposes of formal education in the USA, even prior to the Common School Movement of the mid-nineteenth century, was to shape new waves of the nation’s citizens (e.g., Webster, 1790/1965). If the country was to be a vibrant democracy, it needed a citizen base that could adeptly participate in the required activities of a democracy. Education was viewed by many citizens as a means toward that end, and whether educators embraced the aim of preparing citizens or not, they did just that. As Nel Noddings (2003) argues, “Educational aims always reflect the aims—explicit or implicit—of the political society in which they are developed” (p. 88). Citizens were (and are) schooled, explicitly and implicitly.

As suggested by the question in the title of Joel Westheimer and Joseph Kahne’s study (2004a; see also Westheimer & Kahne, 2004b) of citizenship education (“What Kind of Citizen? The Politics of Educating for Democracy”), there is significant debate about what it means to be, and educate, a citizen. What is a citizen? How does one become that citizen? What is the teacher’s role in teaching for good citizenship? These and related questions are taken up by numerous scholars (e.g., Kahne & Middaugh, 2008; Knight Abowitz & Harnish, 2006; Parker, 1996; Rubin, 2010), often in relation to the work of social studies education. These scholars have put forth helpful citizenship constructs (e.g., Parker’s traditional, progressive, and advanced citizens; Westheimer and Kahne’s personally responsible, participatory, and justice-oriented citizens). These constructs and the answers to the complicated questions above seldom, if at all, approach any semblance of ecological citizenship.

In the introduction of *National Curriculum Standards for Social Studies* (2010), the National Council for the Social Studies (NCSS) states “the primary purpose of social studies is to help young people make informed and reasoned decisions for the public good as citizens of a culturally diverse, democratic society in an interdependent world” (p. 9). Students, it advises, should study the social sciences and humanities in order to become effective citizens who work for the betterment of the communities that they inhabit. To us, this is an argument for ecological citizenship. Even though something akin to what David Orr (1992) calls “reading the vital signs of the earth,” which we argue below is part of ecological citizenship, is omitted from these words, it is surely implied. After all, the public good is tied to clean air, uncontaminated water, and healthy food; and the borderless reality of pollution (like other ecological harms) makes clear the need for understanding an interdependent world.

Although citizenship education is typically (and historically; Evans, 2004) seen as the domain of social studies education, as is supported by NCSS, it is the work of all school personnel, not just social studies teachers (Grant & VanSledright, 1996). For example, NCSS’ sibling organization in science education, the National Science Teachers Association (NSTA), emphasizes one of the purposes of environmental education as informed citizenship. In a position statement, NSTA “strongly supports environmental education…because student knowledge of environmental concepts establishes a foundation for their future understandings
and actions as citizens” (2003, introduction paragraph). Students learn science, as well as every other subject, with implications for citizenship.

While it is important for teachers of science and other subject areas to recognize their roles in teaching students to be effective citizens, social studies teachers must convey in their direct focus on citizenship education that civic action cannot exist separate from stewardship of the earth. Such sentiment, though, is often marginal, at best, in the literature of social studies education. Neil Houser (2009) notes how the field of social studies teaching and research often fails to contextualize humans and their society within their larger environment.

In spite of important curricular and pedagogical advances, the field remains decidedly anthropocentric in nature. Of course, the problem is not simply that social studies focuses on society. This makes perfect sense. Rather, the problem is that most of the work in the field has tended to conceive of society as if humanity were separate from the world in which we live. The vast majority of the scholarship precludes serious attention to the reciprocal relationships between humans and the earth… (p. 205)

Thus, following Houser, we need to reexamine what we mean by social when we talk of, teach, and learn the subject of social studies.

Over a decade ago, Bill Bigelow (1996) wrote that “It’s about time the entire curriculum began to ask: What about the earth?” (p. 17). This idea still rings true. How often, for example, is the perspective (or perspectives) of the earth one (or more) of the multiple perspectives taught in a lesson about the U.S. Civil War or the concept of supply and demand? And yet, centering the earth in the curriculum is a tall order as social studies is quickly evaporating from schools, particularly in the elementary grades, and having to compete with the curricular creep of standardized testing preparation in middle and high school grades (Barton & Levstik, 2004; Bolick, Adams, & Willox, 2010). Teaching for ecological citizenship not only brings into focus and values the earth and its oft-overlooked human and non-human communities, it implicates all subjects and disciplines of the schooling curriculum; it is inherently interdisciplinary and cross-curricular.

**Ecological Citizenship**

There is no deep field of work on teaching students to be ecological citizens. Thus, we build our view on ecological citizenship primarily by drawing upon David Orr’s work in ecological literacy and the broad themes of citizenship developed in the social studies literature (as highlighted above). Generally defined, ecology is the relationship between organisms and their environment; and, citizenship is active participation in a community. An ecological citizen recognizes the importance and interconnectivity of all living beings, human and non-human. This citizen understands that she or he is responsible to all beings and actively seeks sustainable futures for them. In this sense, sustainable future means that the quality of a living being’s life improves over time. However, it also means that a living being’s descendants will have a higher quality of living because of the responsible actions of that being at the present time. This notion, has root in the communal law of the Iroquois Constitution (see Web-Based References below), and is sometimes referred to as “seventh generation sustainability.” That is, a living being’s actions should do no harm to the lives of living beings seven generations into the future. One being is connected to all other beings, across all places and all times. Although life is lived locally and in the present, it is contextualized far beyond our immediate bodies.
Following David Jardine (1998), thinking about the “life” of a piece of paper can quickly concretize this abstract point about the connection of all living beings across places and times. Consider a sheet of paper once in a student’s hand. From what materials, and where, did the paper come? Perhaps its primary source was a tree. How was it made? The tree was cut down, reshaped, and sent to a factory in order to undergo a manufacturing process that, ultimately, makes sheets of paper. How was it obtained? The paper was transported from the factory to a store, where it was purchased. After use, what happened to the remains of the paper? It was thrown in the trash, and after moving through a series of refuse-collection steps it eventually wound up in a landfill. Over the course of its life, this paper traveled many miles. Along the way, it impacted many other lives: those of the birds that lived in the original tree; those of the loggers who sent the tree to the factory; those of the workers in the factory who made and packaged the paper; those of the workers at the store who shelved and sold the paper; those of the refuse collectors and movers; those of the people who live (and will live) near the landfill; and those of so many other living beings directly and indirectly related to that one sheet of paper’s life. All of these connections indicate a sustainable future is not just about individuals being responsible to their immediate biological descendants. Rather, it is about communities of individuals being responsible to all future communities, which is why caring about a sustainable future is an act of ecological citizenship.

The author and scholar David Orr, in his book *Ecological Literacy* (1992), explains that a person who is ecologically literate is not just able to read letters and numbers but also the vital signs of the earth. Having a strong sense of one’s interconnected relationship to all that surrounds, including from the non-human world, is essential. This requires awareness, perception, critical thinking, and a host of other skills. It requires an appreciation for justice. The key, Orr offers, is to constantly ask, “what then?” When oil flows unabated from the floor of the Gulf of Mexico for months, what then? When fires burn, rivers flood, and tornadoes spin beyond previous patterns, what then? When asthma disproportionately impacts youth of color, what then? Such questions can be asked on a smaller scale too. When classroom windows do not fully close, what then? When a friend does not have food to eat, what then? When an electronic device is plugged in, what then?

These types of questions offer important learning opportunities and can breed action for all people, particularly students. While ecological citizenship requires ecological literacy, it is the product of a lifetime of education, extending well beyond school walls and years. Schools certainly have a role to play in the cultivation of such citizenship. In *Earth In Mind* (1994), Orr directly connects ecology, citizenship, and education to an “ecological emergency” marked by climate instability, human abuse of natural systems, challenges to biological diversity, and other matters that challenge sustainable living on earth. This emergency, he writes, “can be resolved only if enough people come to hold a bigger idea of what it means to be a citizen. This will have to be carefully taught at all levels of education” (1994, p. 32). With these words, Orr gives educators a powerful charge to teach for ecological citizenship. General beliefs about what it means to be a citizen, however, have to be challenged in the process.

**Danger: Authorized Personnel Only**

In the USA, there is a growing national conversation about the country’s energy dependence considering such questions as: What are the nation’s energy sources? From where
do they come? How are they retrieved? The 2012 governmental elections featured frequent talk about energy, from local elections—like in Pennsylvania, where Mark (first author) lives and where considerable coal and natural gas is underfoot—all the way up to the federal level and the presidential election. In each of the three October presidential debates, Candidates Obama and Romney emphasized their plans for the country’s “energy future” and drew connections to issues like national security, jobs, and healthy living. And yet, much of the campaign talk hardly did justice to the complexity of energy issues (e.g., Zeller, 2012).

There is growing awareness about energy consumption as these and other questions are asked: How much energy do Americans consume? How can Americans limit consumption and conserve energy? The massive earthquake and tsunami that struck Japan in March of 2011 contributed additional questions about energy production to this mix, and specifically about nuclear power plants. Most power plants in the USA, however, are not of the nuclear variety. According to the United States Energy Information Administration (2012), 42% of the nation’s electricity is derived from coal, 25% from natural gas, 19% from nuclear power, less than 1% from petroleum, and the remaining 13% from various renewable sources including energies like hydroelectric, biomass, wind, geothermal, and solar. For many of us, this power-production is not too far from where we live, work, and go to school.

Despite our proximity to power plants, we generally pay them little attention. They are off-putting: huge and scary, often noisy and smelly. We see them from far away but they are off limits at close range, sitting behind chain-link fences and other barriers. Since the scale of the work inside a plant is enormous, providing electricity for thousands of homes, businesses, and other facilities, we deem it beyond our purview. We know we use energy when we plug in our electronic devices, and thus implicitly we know that it must come from some place and some process, but this knowledge is hidden behind the plant’s boundary fences. There is no visible link between the plant and our outlets. Following the electricity flow requires some imagination to see a link, especially when the reliable operation of any electricity-requiring gizmo is usually a tacit declaration that we should think about other things. The adage, “if it ain’t broke, don’t fix it,” morphs into, “if it ain’t broke, don’t consider it.” Unless we receive an exorbitant bill for electricity consumed, matters energy-related are likely off the radar. All of these aspects of a power plant seem to scream the same implicit message: “Danger: Authorized Personnel Only.”

We cannot be responsible citizens without paying some attention to our local power plants. We must declare ourselves authorized personnel. Or, we at least need to ask: who are the authorized personnel and what decisions do they make on our behalf? A power plant is a personal matter; almost no one is disconnected from a plant. Anyone who plugs something in, or turns something on, is implicated in the workings of the plant. More importantly, a plant is a public matter. Communities hinge on power consumption. Far greater than just private residences, a power plant serves all electricity-dependent aspects of the community: an art gallery, a baseball stadium, city hall, a hospital, and each and every school. Imagine how electricity makes possible your daily living. Now, imagine how electricity impacts your community’s daily living. The impact of electricity does not just involve our dependence on it. The power plant provides a variety of jobs for local workers, both inside and out of the facility’s walls. It influences the non-living abiotic factors of the community (e.g., air, soil, water) that shape the quality of the community’s health, especially for all who live, work, and go to school near the plant. Regardless of the amount of one’s personal electricity consumption, the plant
impacts every member of the community. Thus, when a new plant is considered, the many
questions—like where the plant will be located, what kinds of operations will be conducted
inside, how these operations will impact the surrounding environment, and who will make the
decisions about these operations—are public in nature, needing the scrutiny and deliberation of
all people in the community. Additionally, those members of the community who do not have a
deliberative voice (like living non-humans and abiotic factors) need to be spoken for.

If our personal and public links to the power plant are not felt and understood, we are
well removed from these questions. Students, furthermore, are often further removed from them.
When we, Mark and Angie, think back to our days as elementary and secondary students, the
topic of power plants does not come to mind. We do not recall studying how electricity lit our
schools and from where that electricity came. We suspect this is true today for many students.
As students—living, breathing, eating, running, growing—are members of our communities
alongside of us adults (and not to mention that they are the ones who will live longest in the
shadow of a newly-built plant), they need to be question-deliberators as well:

- What does it mean to be implicated in the workings of the plant?
- Do we who use electricity involve ourselves in the stories behind that usage?
- How can we connect our individual electricity actions to others’, seeing a community of
electricity action?
- How can we link this collective action to the well being of our community, including
humans and non-humans?

With the community’s youth welcomed and engaged in the plant decision by educators and
policymakers, citizenship can be taught and experienced (i.e., learned) as active, collaborative,
and, importantly, ecological.

Interdisciplinary Study Of Lansing’s Power Plant Proposal

Lansing, Michigan’s Boys & Girls Club is an important community place for youth,
particularly those of color and/or from low-income families. During the school year and in the
summer, the Club provides spaces and resources for various activities like working on
homework, playing basketball, reading, and joining youth organizations. One program in which
many Club youth participate is GET City, a collaboration between the Club and Michigan State
University (MSU). GET City meets at the Club weekly throughout the school year (and in the
summer it meets daily for a three-week stretch). Participants are 5th-8th grade students at a
number of elementary and middle schools across Lansing. The teachers, including Angie and
formerly Mark, are a combination of professors, graduate students, and undergraduate students
from MSU. Past graduates of the program serve as teaching assistants. The program’s main
goal is for urban youth to learn about science and engineering related to energy sustainability and
information technologies while working within and for their surrounding community. Students
become “community science experts” (Calabrese Barton & Tan, 2010a, 2010b), which means
they actively participate as citizens, with their developing foundation of scientific knowledge and
literacy, in local community issues. While GET City is a program unique to its time and place,
there are a number of examples of classroom teachers and outside-of-school programs
undertaking similar socioscientific, community-based initiatives (e.g., Broda, 2007; Danaher,
Biggs, & Mark, 2007; Lousley, 1999; Roth, 2007), as well as teacher resources about schooling
for sustainable futures (e.g., Stone, 2009; Stone & Barlow, 2005).
GET City is a science education program. However, and importantly, it is also a social studies education program. There is a considerable amount of most of the school subject areas in GET City (e.g., students do quite a bit of math, write in many different forms in each unit, and learn a host of computer skills). After all, any compelling social issue is fundamentally interdisciplinary. By learning from multiple angles, we think students better grasp the integrity of the issue, whatever that issue is, including its inherent complexity. The power plant issue in Lansing is not one-dimensional. It involves finances, health, labor, ethics, politics, and a host of other concerns. Rich and complex, it is far from straightforward and exactly what we want our students to dig into.

The GET City classroom probably does not look like most social studies (or other subject area) classrooms. It is unique in that it is after school and at the Club (even though the Club, in physical and social respects, is very much like a school), and it has a low teacher to student ratio. But these features do not afford interdisciplinary work; they just enhance it. Any classroom, we feel, can integrate different disciplinary lenses in its course of study. Thus, we describe below the interdisciplinary unit about Lansing’s proposed power plant that sought to build students’ ecological citizenship. We hope that its story will provide inspiration for teaching social studies (and other subjects) for ecological citizenship.

**What’s going on? Lansing’s Energy Situation.**

Like in many places across the USA, the residents of Lansing faced a decision about the future of their energy supply, which is overseen by the publically owned Board of Water & Light (BWL). In the winter of 2009, BWL sent a letter to its customers explaining that Lansing “has an aging power plant that is increasingly costly to operate and which faces mounting environmental challenges.” The letter proposed a threefold energy plan, the most significant part of which was building a new hybrid power plant that would generate electricity from 70% coal and 30% biomass sources. Unlike coal, biomass, which is organic material made from plants and animals, is a renewable energy source. There is controversy about whether biomass is a clean energy source, since carbon dioxide (CO$_2$) is released when it is burned but it is derived from plants that consume CO$_2$. Justifying the new plant, the letter explained that there were two choices: “either build a more efficient, greener power plant, or buy electricity on the volatile open market.” While both of these choices would mean increased energy bills in the future, the envisioned hike associated with the new plant would cost one third that of the hike from the “volatile open market.” The letter concluded by inviting public input as a panel of citizens reviewed the plan and made recommendations over the coming months.

Although BWL’s letter was meant to inform the public, it did not address a number of questions. Why so much coal, especially when the old, 100% coal-burning plant had “mounting environmental challenges?” What about alternative energy sources that are both renewable and clean, that is, *green*? What would the new plant mean for local environmental health ten, thirty, fifty years into the future? Where would the plant be located? What other options existed? The letter appeared to frame the issue in narrow terms, and there was important context surrounding these unasked questions. Green refers to energy sources that are both clean and renewable. Sunshine and wind are green energy sources. Coal is not since it is neither clean (i.e., the burning of it releases CO$_2$ into the atmosphere) nor renewable (i.e., there is a limited supply of coal). Further, the location of a power plant is a major environmental justice issue. A large body of research has shown that power plants overwhelmingly are located near human communities.
made up primarily of people of color and/or poor people with minimal political clout (Brodkin, 2009; Bullard, 2005).

At the same time that BWL called for a new plant, the city and its state were mired in economic struggle. Local and state budgets were annually being reexamined and slimmed. A large number of Lansing residents faced foreclosure on their homes and lost jobs or endured demotions to part-time status at work. Even if not directly impacted by one of these life-altering happenings, many in the community felt the side effects: a local school or a favorite eatery shuttered; media headlines offered solely depressing news; and, family and friends moved away in search of employment and better prospects. Economic hope for many was fleeting, but talk of any projects that might create jobs—like the construction of a new power plant—held promise.

**What Does this Mean? Getting Smarter About the Power Plant Proposal**

With the power plant proposal as the crux of BWL’s energy plan, GET City entered a unit focused on the question, “should my city build the proposed hybrid plant?” This question was framed in fairly stark terms—yes it should or no it should not—but, our main point was to engage students in serious study and informed dialogue about why the issue is much more complex than simply a yes-or-no response. Given BWL’s own stark framing of the issue, we wanted students to gain the knowledge and skills they needed to turn the narrowly framed problem into a nuanced inquiry.

Table 1
**Brief Overview of Power Plant Unit**

<table>
<thead>
<tr>
<th>Unit Aspect</th>
<th>Power Plant Unit Example(s)</th>
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</thead>
<tbody>
<tr>
<td>Organizing question</td>
<td>Should Lansing build the proposed hybrid power plant?</td>
</tr>
<tr>
<td>Pre-assessing current knowledge</td>
<td>Students completed an online survey about Lansing’s power plant proposal</td>
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<tr>
<td>Building on prior knowledge</td>
<td>Students, in a previous unit on coal:</td>
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<tr>
<td></td>
<td>● Studied mountaintop removal, including personal stories related to it</td>
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<td></td>
<td>● Mapped coal’s extraction and travel to a local power plant</td>
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<td></td>
<td>● Critically viewed “clean coal” advertisements</td>
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<td></td>
<td>● Conducted a coal-burning simulation</td>
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<td></td>
<td>● Wrote and performed raps about the effects of burning coal</td>
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<tr>
<td>Gathering information</td>
<td>Students:</td>
</tr>
<tr>
<td></td>
<td>● Annotated and discussed BWL power plant proposal letter</td>
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<tr>
<td></td>
<td>● Surveyed peer and community knowledge about proposal</td>
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<tr>
<td></td>
<td>● Interviewed via email local energy experts about Lansing’s energy possibilities</td>
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<tr>
<td></td>
<td>● Conducted renewable energy experiments</td>
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<tr>
<td></td>
<td>● Visited two community sites where renewable energy is used to generate electricity</td>
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<tr>
<td>Taking action</td>
<td>Students:</td>
</tr>
<tr>
<td></td>
<td>● Created a variety of informative products that could be used to educate the community</td>
</tr>
</tbody>
</table>
• Presented their products at a community forum of peers, parents, and community members
• Revisited and responded to the unit question

Prior to taking on this unit question, the students had spent three months investigating how local coal-fired power plants worked. We recall the day personal narratives of mountaintop removal’s impact on local ecology were explored. As youth read about and listened to stories of families in Appalachia, and used Geographic Information Systems to track how MSU’s power plant receives coal directly from mountaintop removal sources, they expressed both awe and concern for how the simple action of turning on a light bulb can affect a family hundreds of miles away. In a related activity, while looking through magazines and on the Internet at “clean coal” advertisements, Aisha was dismayed that advertisers “hid the truth.” Felton asked if we could get some of our own coal to show how it makes smog and to see if we could somehow see or capture the CO$_2$. We then brought in soda bottles, charcoal briquettes, ice, and matches in order to simulate how coal burning produces smog and contributes to acid rain. From this activity, students discovered that coal burning has other by-products such as nitrogen oxide and sulfur dioxide.

In this prior unit, the youth came across some stark numbers that resonated close to home. Coal-fired power plants make up about one third of the nation’s CO$_2$ emissions each year. Lansing’s Eckert Plant releases over 2 million tons of CO$_2$ per year. Connecting the dots between greenhouse gas emissions and climate change, one group of students linked coal and global warming in a rap that they wrote and performed:

Today was a bad day
We are burning coal
Too much greenhouse gases
Heating up the earth
And that releases carbon dioxide
And that causes global warming
The sun is renewable energy
And that helps global warming
Today was good day.
Word.
Yeah.
Word.

The power plant unit was designed to build on students’ prior knowledge of coal (from the previous unit) and extend into learning about different forms of renewable energy and the possibility of meeting demand through alternative sources. (See Web-Based References below for a detailed mapping of the unit.) We began with an online survey and learned that none of the students were aware that a new plant was being considered. We then examined information provided by BWL, including its letter to customers about the proposed plant. We told the students that all of their parents, the Club, and we (i.e., all of the teachers) had received this letter in the mail. Each student received a copy of the letter, and while one of the teachers read the letter, students highlighted aspects that raised questions or concerns for them. When they were
done highlighting, we asked the students to underline one sentence that they thought was most important or interesting and write about why they chose that sentence.

The class discussion that followed was frantic. “Is this plant going to be green?” “Isn’t 70% coal still too much coal?” “What is biomass and how does it become electricity?” “Is biomass a good replacement for coal?” Some students were surprised that the new plant would raise electricity costs. Timona, commenting that her mother “doesn’t really care about global warming but she always says every dollar counts,” speculated that her mother would be concerned about how building the new plant would affect electricity costs. Several students asked, “What is a volatile open market?” Jeremy, whose father was a construction worker struggling to find steady employment, asked, “will the plant create more jobs?”

With a wealth of important questions raised, we dug into the context surrounding the plant proposal with several information-gathering projects. The students surveyed their peers and adults in the community about the plant proposal, investigating whether people were aware of it and how they felt about it. Students wrote emails to local energy experts, asking them to assess the renewable and clean qualities of energy sources such as coal, wind, solar, and biomass. (While we narrowed our focus to these sources, others could be looked at, particularly nuclear and natural gas, which have emerged as publicly prominent in the time since this unit.) Students also asked about the practicality of these sources for Lansing. Having heard that Michigan ranks as the second best state for potential wind energy production, for example, one group of students wrote to a wind energy expert about the viability of harnessing wind in Lansing. The group learned that despite ample wind along the shores of the Great Lakes, Lansing’s location in the center of the state drastically limits its wind energy potential. Wind could be a small, complementary solution but likely not a predominant source for the community’s energy needs.

Then, the students conducted small-scale wind and solar power experiments in order to simulate electrical production. These experiments helped them understand the science behind how wind and solar power generate electricity. Additionally, GET City took two field trips to local places that generate electricity from alternative sources. On one of the trips, we were surprised to see that on a cold and snowy winter day, Lansing’s main solar array actually used—rather than produced—electricity. It was clear that current technologies in use in Michigan did not necessarily make solar a viable stand-alone option. Students, however, were surprised to learn that countries like Germany, with similarly gray winter skies, rely extensively on solar technology. With this knowledge, Celia exclaimed to her group, “if Germany can do it, we can too.” From these investigations, the students learned that solving “America’s energy needs” is not simple or straightforward, it requires a commitment to reducing consumption and searching for real alternatives.

**What Can We Do? Taking Action as the Unit Takes a Turn**

Getting smarter by itself is not enough, especially as it relates to important community issues. Youth need scaffolded opportunities to transform what they know into actions that are salient to them and their communities. As the GET City students continued to work on their projects, a BWL announcement shifted the trajectory of the power plant unit. The plant proposal was pulled back in order to allow for more study and planning on the issue. A local newspaper ran an article titled, “Push to go green may undo BWL plans,” and it explained that the possibility of changing federal policies on power plant emissions was the impetus to revise the
plan. The proposed plant—what BWL had been referring to as “Lansing’s energy future”—was slated to undergo further deliberation.

The unit question (“Should my city build the proposed hybrid power plant?”) was still on the table, but the context surrounding it had become more dramatic in ways that we felt opened up the question to a greater level of community significance. The news was an exciting development, confirming that what we were studying was a live issue and not a meaningless abstraction. With the introduction of new governmental standards for power plant construction, more factors could be considered in the mix. The students’ knowledge from exploration into wind and solar did not seem far-fetched or irrelevant. Their ideas could actually inform the broader debate without having to simply side yes or no.

A community forum at the Club was organized and took place near the end of the unit. Students showcased their work to an audience of peers, Club staff, families and friends, other Lansing area residents, and a collection of local energy experts. In small groups, students created information booths that they ran as visitors circulated. Some booths featured short digital stories in the form of public service announcements focused on the dangers of coal. Some presentations focused on forms of alternative energy, such as solar, wind, and biomass. Each student group was charged with explaining its topic and identifying four or five key points important in taking action on Lansing’s power plant issue. Other booths operated alternative energy experiments and shared data collected from community surveys about the power plant proposal. All of the booths featured posters about the science involved in energy production and encouraged visitors to ask questions of the presenters.

A panel discussion of experts followed with people from local groups who held differing perspectives about what was best for Lansing’s energy future. The panel provided GET City students and community members an opportunity to hear divergent ideas about Lansing’s energy needs and ask questions of the panelists. At the conclusion of the forum, one of the panelists, BWL’s executive director of strategic planning and development, remarked that the forum had provided him an opportunity to hear community voices and concerns he might not have heard otherwise. Indeed, it was the first time that a representative from BWL came face-to-face with a local environmental coalition firmly against coal-based energy production.

**What Do I Think Now? Responses Across the Spectrum**

We finished the unit by returning to the central question. Even though BWL’s plan had been pulled back, we asked the students if they could justify answering the question with a “yes” or “no.” While some students could arrive at a clear answer, it wasn’t easy. For Zeus, Lansing needed to move ahead with building the plant according to the proposal. “It is healthier and better than the old one,” he concluded. Although he conceded that the design could be greener, the proposal signified progress. Nadia expressed views opposite to those of Zeus. For her, an acceptable proposal would have to use less coal. Jana was torn. On the one hand she opposed the plant “because it can still cause CO₂ and pollution.” On the other hand, she supported the proposal and its dependence on coal because “in Lansing we cannot use wind [to generate electricity] because we don’t have enough and we can’t use solar because we have [too many] cloudy days.”
Learning and Teaching for Ecological Citizenship

Ecological citizenship, as Jana’s words indicate, is not easy. It requires wading into the complexity of relevant social issues, feeling out the boundaries, hearing the different perspectives and learning about the struggle between them, making sense of the stakes for all living beings and their surrounding communities, and taking action. Even though Jana and her peers had taken these steps, there wasn’t necessarily a clear path forward on the issue. More work needed to be done, by them and by the entire community. Whatever the future outcome on the issue, it could result from informed deliberation (see Hess, 2009). Now, three years later, a new BWL plant proposal that does not involve coal has been approved. The new plant will rely on natural gas, a topic also in need of study, especially with the rise of the controversial practice of hydraulic fracturing that extracts the gas from the earth.

If ecological citizenship is tough, so is teaching for ecological citizenship. This does not mean, though, that tough equates with impossible or unnecessary. It means that lessons and units might end, even despite substantive learning and action, with more questions. Such questions are born out of a cyclical process of thought and action that can provide the context for students to gain experience as democratic workers on important social issues (Hess, 2009). At the same time, complexity and uncertainty can be conduits for the development in students of critical thinking, a commitment to, and caring for, others, and community action. We think the GET City unit detailed above demonstrates these developments. Importantly, the unit also demonstrates that students are emerging as active citizens who are committed to the sustainability of the earth and its living beings. As future issues arise, we hope that they will read the vital signs of the earth and ask what then?

Conclusion

Social studies education is foremost the work of citizenship education. The conceptions of citizenship put forth in classrooms, as well in the research literature, however, often frame citizenship as a political affiliation solely, and not an ecological affiliation (Houser, 2009). While citizenship frameworks such as Westheimer and Kahne’s (2004a) allow room for ecological considerations (particularly in the visions of citizenship that they call “participatory” and “justice-oriented”), the affiliation is explicitly political. Ecological considerations are silent and silenced. Social studies teachers can do much to end this educational silence about the earth. While this can be done explicitly, placing an ecological focus overtly at the center of the curriculum, it also can be done implicitly, as in the case of GET City. In our units, we don’t tell our students that we are helping them develop their ecological citizenship. Rather, we tackle compelling local issues, a by-product of which, with detailed and responsible study, is that students develop the critical capacities of ecological citizenship. We don’t tell students to care about the power plant’s emissions; rather, they care about the power plant’s emissions because they see a connection between the quality of the air and water and their health.

Regardless of the topic area taught, social studies teachers can frame citizenship in ecological terms, and do so without omitting other, more traditional elements of citizenship education. (See Appendix for a few examples of ideas for teaching ecological citizenship in social studies classrooms.) We recommend that teachers approach lessons and units as askers of questions, and that they position students to ask and grapple with those same difficult questions. Not only does such learning place students as investigators at the heart of issues authentic to
them, the disciplinary boundaries that are often so rigid in schools can be crossed in meaningful ways. Teaching for ecological citizenship is a cross-curricular invitation to integrate student learning from all corners of the school and beyond. In such a setup, citizenship is no longer just a social studies theme but an educational one.

References


Web-Based References


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Appendix

Here are a few of many possibilities for re-framing citizenship in social studies classes in terms of ecological citizenship. (It’s important to note that GET City’s unit studying the local power plant proposal is one of many different topics that can be studied ecologically; one does not need a local power plant debate to engage rich study and foster authentic learning.)

- What are some environmental issues that impact you, your students, and your school? Do you have a nearby river that is polluted? Is there heavy smog above? Is the surrounding earth being drilled for natural gas? Any of these topics, and so many more, are deeply connected to the health and well-being of your local community—and, the health of your local community influences the health of other interdependent communities. How might you and your students investigate these issues and contribute to the community dealing with them?

- Might you take an existing unit that you teach and add an ecological lens? While teaching about multiple perspectives related to any historical or social event, could you also consider the perspective (or multiple perspectives) of the earth? For example, what might be the earth’s perspective(s) about the U.S. Gold Rush of the mid-Nineteenth Century?

- Sustainability is a central idea to ecological citizenship. When teaching students about any form of decision-making, could you share with them the idea of seventh generation sustainability? Based on ideas from the Iroquois Constitution, the concept of seventh generation sustainability demands that decision-makers consider the next seven generations of living beings (humans and non-humans) when determining how to act on a particular issue. Therefore, when students decide to plant a tree or draw a picture of their future home, they would need to take into account the tree or home’s impact on life many years from the present.

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