

Start Local, Go Global: Community Partnerships Empower Children as Scientists and Citizens

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Holding up a plastic shopping bag, an adult volunteer (a guest reader who visits each week) in a third grade classroom in rural southeastern Ohio asked, “How do you use these?” Children replied enthusiastically:

“To carry our groceries.”

“To pick up my dog’s poop!”

“To pack my clothes for dance class.”

The guest reader then asked, “What happens to the bags when you’re done with them?”

“I throw them away.”

“Some might end up in the river or the ocean.”

“We recycle them.”

One student elaborated, “I think they are around forever. Like, in a hundred years, they would still be the same.” Using their silent connection sign, several children motion in agreement. Another child offered, “My mom told me we might have to pay for plastic bags at the grocery store now, but a lot of people don’t have enough money for that.”

The guest reader acknowledged, “Yes, city officials are considering asking people to pay to use plastic bags like these at our local grocery stores. Let’s read a book together, *One Plastic Bag: Isatou Ceesay and the Recycling Women of Gambia*, so we can continue our conversation about plastic bags.”¹

Recent research indicates that young learners are both capable of and eager to engage in discussions about relevant social studies issues with local and global significance.² Social studies as a school subject offers a diverse curriculum that may be meaningfully integrated with other content areas. Despite this, research reports that time for social studies in early childhood classrooms is decreasing.³ Similarly, science instructional time has also declined over the last two decades in large part due to greater emphasis on standardized test preparation in math and language arts.⁴ Many teachers are finding that adopting an integrative model of social studies and science teaching can be

a meaningful way to increase children’s engagement with both subject areas, while addressing content and teaching social studies standards and Next Generation Science Standards (NGSS), particularly in the areas of resource allocation and science, human consumption, technology, and society.⁵ Connecting with community partners like museums and libraries may help teachers increase their students’ awareness of and engagement with societal issues, both locally and globally. In this article, we describe three mini-units involving community partnerships in rural southeastern Ohio that allow K-3 children to become informed citizens, scientists, and activists by fostering a strong sense of civic engagement and agency. We then suggest ideas for extending these projects and connecting to children’s literature to make them applicable for teachers of young learners in many different settings.

Developing Citizens and Scientists

Young children need authentic learning experiences that help them feel connected to their communities through hands-on and first-hand experiences.⁶ Engaging students in real-world issues within their communities allows students to not simply study citizenship, but to practice it. Informal learning settings such as parks, libraries, and museums often have educational goals that overlap with schools. Their staff welcome opportunities for connecting informal (out-of-school) learning to formal (in-school) learning in accessible and developmentally appropriate ways.⁷ Informal learning settings encourage both independent and group exploration, foster a high level of active engagement, and are hands-on and play-based, making them appropriate places for meeting the developmental needs of young learners. Additionally, as a significant amount of learning happens outside school settings, finding ways to bridge the gap between school and informal learning is important for creating authentic experiences for children.⁸ To truly bridge

the formal-informal learning divide, collaboration between stakeholders is essential.

In order to integrate social studies with science, we relied on a framework known as Socioscientific Issues.⁹ SSI uses societal issues as they are related to science to promote agency and empowerment while advancing scientific literacy. Examples of SSI range from large-scale issues such as climate change, deforestation, animal research, and the use of nuclear energy to generate electrical power, to more local concerns such as bicycle helmet regulations, beach restoration, and even personal health decisions such as the safe use of cell phones (which give off low amounts of radiation and cause distraction) and healthy food choices.

Such issues are not settled easily by science alone, either because the scientific evidence is tentative, or the issues touch on ethical concerns such as government regulation/paternalism (“Is this the government’s business?”), autonomy/personal freedoms (“It’s my body, my choice”), human v. non-human interests (e.g. animal rights, stewardship) and local v. global interests (“Why should we care about them?”).

When SSI is implemented in the classroom, students engage in evidence-based arguments through debates and discourse as they grapple with the personal and societal consequences of their actions (or inactions). For example, students might grapple with the question, “Should speed limits be lowered to reduce traffic fatalities?” by examining related science lessons (about forces and motion) along with the effect of such legislation on various constituencies (e.g., business owners, truck drivers, police, environmentalists, and ordinary travelers) and their concerns (about safety, cost, profit, environmental impact, and public expenditure).

These activities prepare students for informed, participatory citizenship and empower them to be thoughtful decision makers who can evaluate “messy” decisions that often do not have clear answers. A wide body of research also suggests that SSI promotes moral development as students exercise empathy, reflective judgment, and a desire to “do what’s right” in the world. When this framework is coupled with out-of-school experiences with community partners, students have the opportunity to put all of their newly-developed citizenship

and scientific skills to work—as seen in the following examples.

I. Bee-ing There for Bees

Early childhood teacher candidates from Ohio University work closely within local schools to create opportunities for children and schools to explore integrative societal issues with community experts. For example, as part of a mini-unit, second grade children engaged in an exploration of bees within

the southeastern Ohio region. Children observed bees’ behavior in their school’s native species flower garden, read a book about bees (**Sidebar**, p. 6), created replicas of honeycombs in math, and talked to a local beekeeper.

The beekeeper described the importance of bees as pollinators for local crops, as well as various threats to bees both locally and around the world—habitat loss, reductions of native plant species, and use of pesticides. Students explored issues such as, “How do bees help our community?”, “What is hurting bees in our community?” and “What can we do to create safe environments for bees in our community?” Class discussions emphasized the ways in which humans and bees share limited resources (habitats) and that human use of the resource has had profound impacts on the bees, which in turn impact humans. These discussions reinforced important concepts surrounding resource allocation that are relevant to both social studies and science standards. Additionally, students explored the impact that new technologies (such as pesticides) have had on bees, which in turn impact our crops.

Teachers can create an “Agree-Disagree Spectrum Line” by posting the words “Agree” and “Disagree” (or “Yes” and “No”) on opposite ends of a long line. Masking tape can be placed on the floor to create an actual line for younger students, while older students can be asked to envision an imaginary line. We posed a question for students, “Should it be illegal to kill bees?” and instructed them to show their opinions by where they stand along the line (i.e., those who feel strongly one way or the other move to the pro or con end; those who don’t feel as strongly stand closer to the midpoint; and those who are “on the fence” stand at the midpoint). We encourage students to discuss their chosen placement, reminding them



“Eyana, the bee” by Sydney Franklin, 2012 (StreetSense.org/Flickr)

to use evidence that they learned about bees to support their arguments.

Another strategy is to challenge students to develop a policy for local bee protection while role-playing different stakeholders in the community: a beekeeper, an orchard owner, a citizen who is afraid of bees, and the owner of a company that makes pesticides. Examining maps showing current and past land can illustrate the concept of habitat fragmentation, which also impacts bees and humans. The activity also provides a historical context for the issue. By engaging in these activities, students learn some steps that can help bees, including: 1) Planting native plant species in your garden; 2) Reducing pesticide use; and 3) Helping scientists who study bees to spot them. Students can then develop group plans for educating the community about native species and pesticide use. They can develop a native plant garden, and take photos of bees that can be uploaded on The Bumblebee Watch's website (www.bumblebeewatch.org), which assists scientists in their research.

These activities emphasize perspective taking, use of evidence in argumentation, and finding common needs and concerns among people as public policies are developed. We assessed student learning with reflective journals in which students responded to questions about the relationships between bees and people, as well as recording their emerging views on this issue. Key in this approach, however, was identifying a strong community connection through engaging with local beekeepers and studying locally focused news stories about bees. After local connections are made, global issues related to declining bee populations are explored, and questions such as, "Are bees in other parts of the world facing the same threats as the bees in my community?" and "What are people in other places doing to help bees?" may be posed. Making the topic relatable to children makes social activism more likely.

II. Bright Ideas about Energy

A second partnership involved the Ohio Valley Museum of Discovery's Green Revolution exhibit, where preschool to sixth grade children engaged in multiple activities that prompted discussions related to energy usage. During school field trips

to the museum, children experimented with "Pedal Power" to electrify light bulbs, played a game about energy conservation with oversized game pieces, and used solar power to help grow seeds. As part of the museum's "Tinkering Station," children created energy-efficient dollhouse components inspired by the U.S. Department of Energy's "Easy Energy Action Plan Checklist."¹⁰ Activities at the museum inspired students to talk about which appliances used the most electricity, how electric-



Katrina Koger/Flickr.com

ity gets to their home, and which type of light bulb requires the most energy to light. Students reflected, "I wonder what kind of holiday lights we use?" "We could save a lot of money by not using incandescent lights." Children were fascinated by energy "vampires," appliances that consumed energy even when they were not being used (e.g. many toasters & cell phone chargers) and wondered how many of them were in their own homes. Museum educators and teachers were able to help children brainstorm ways that they could be energy conservationists in their own homes. Ideas included "Use LED light bulbs," "Unplug chargers when they aren't being used," and "Unplug the toaster after using it."

Back at school, teachers encouraged students to brainstorm additional energy saving tips that could be used at home and school, and to be energy ambassadors who shared their new knowledge with other

children and community members. Inspiring picture books (**Sidebar**) describe people around the globe, including children, making a difference in their communities through energy conservation.

An extension activity is a mock congressional hearing on national energy policy. In this activity, students role-play congressional sub-committee members charged with investigating and making recommendations about a particular energy source (e.g., solar, wind, geothermal, nuclear, hydro, and various fossil fuels).¹¹ Through readings and guided questions, groups of students learn about the pros and cons of each source and are then provided time to present their expert findings to the other committees. The teacher can scaffold such an activity for younger learners by providing students with age-appropriate research sources, including leveled books and videos about energy, graphic organizers for recording pros and cons, and

sentence/argument frames such as, “I think that [source of energy] is the best energy source for the United States because [reason it is the best]” After discussion and debate, students vote on a plan to put forward to the entire Congress on a national energy plan. Students are then assessed on their own response to, “Which energy source(s) do you recommend the U.S. invest in and why?” which students can respond to by writing a letter, videotaping a short public service announcement (PSA), building a simple webpage, or engaging in another creative option. Assess such an assignment primarily on students’ use of accurate and appropriate evidence to support their arguments.

III. Food for Thought

A third example describes a partnership between an elementary school and two organizations with healthy eating and sustainable food growth as their missions. Community Food Initiatives (CFI) is an organization that works to address food insecurity in the region. Live Healthy Kids (LHK) is a program committed to promoting healthy child nutrition. Once a week during the school year, LHK staff led cooking workshops with second grade children. They took a “culinary trip around the



world,” making food from each continent and learning food preparation skills at the same time. When possible, ingredients were locally sourced. Students felt empowered to encourage their caregivers and friends to try new recipes and foods.

Working with children and their families, CFI and the school’s teachers also collaborated in the creation of a school garden with several raised flower and vegetable beds. Third graders worked with CFI to learn how to take care of the garden

Picture Books that Inspire Empowerment and Agency in Young Citizen Scientists

McGuiness, Elle J., and Heather Brown (illus.). *Bee and Me*. Riverside, NJ: Accord/Andrews McMeel, 2008.

In this fanciful book, a boy who is afraid of bees meets a friendly and informative bee who illuminates the many ways that bees contribute to a healthy planet.

Drummond, Allan. *Energy Island: How One Community Harnessed the Wind and Changed their World*. New York: Farrar, Strauss, and Giroux, 2015.

The Danish island of Samsø harnessed wind energy, reduced carbon emissions by 140%, and become almost energy independent in a very short time due to the commitment and collaboration of its citizens.

Brandt, Louis; Vin Vogel (illus.). *Maddi’s Fridge*. New York: Flashlight Press, 2014.

Best friends Sofia and Maddi love to play at the park together. After a play session, Sofia discovers that Maddi’s refrigerator is nearly empty. Spark discussions about food insecurity and how one child can make a difference in another child’s life.

Cole, Henry. *On Meadowview Street*. New York: Greenwillow Books, 2007.

Caroline lives in a suburb on “Meadowview Street,” but wonders what happened to the meadow itself. Through observation and ingenuity, she creates a natural habitat that neighbors observe and then allow to spread .

Paul, Miranda, and Elizabeth Zunon. *One Plastic Bag: Isatou Ceesay and the Recycling Women of Gambia*. Minneapolis, MN: Milbrook Press, 2015.

In Gambia, plastic bags polluted the village environment, even clogging farm fields. Five women, led by Isatou Ceesay, turned the problem into an economic opportunity.

Kamkwamba, William, and Bryan Mealer; Elizabeth Zunon (illus.). *The Boy Who Harnessed the Wind*. New York: Dial Books for Young Readers, 2012.

A picture book version of the *New York Times* bestseller. As a child, the author and his fellow villagers in Malawi built a functioning windmill out of junk, bringing electricity in a time of drought and hardship.

Winter, Jeanette. *The Watcher: Jane Goodall’s Life with the Chimps*, New York: Schwartz and Wade Books, 2011.

A biography of a scientist, author, conservationist, animal right’s activist, and humanitarian. Goodall’s life is an outstanding portrayal of agency and empowerment for everyone, especially girls.

Messner, Kate; Christopher Silas Neal (illus.). *Up in the Garden, Down in the Dirt*. San Francisco: Chronicle Books, 2015.

What amazing things happen in a garden that helps fruits and vegetables grow? Learn about the network of creatures in the soil, roots, stem, and leaves of food plants – and how to keep that ecosystem healthy.

by catching water in a rain barrel and identifying and removing weeds. Students eventually became the primary caretakers of the garden, discovering that they were capable of growing some of their own fruits and vegetables. Children’s literature was used to initiate thoughtful discussions about food insecurity and growing food (**Sidebar**, p. 6). The partnership culminated in an informal learning event in which a preservice teacher and CFI representative helped children plant lettuce seeds in the school garden.¹¹

Thirty percent of children in southeastern Ohio are food insecure. Giving our students the opportunity to explore issues related to the local food movement (e.g. bustling Farmer’s Market) and regional food insecurity, as well as to examine how humans get food around the world, created an empowering partnership for all involved. Many children attended the out-of-school celebration of this event and encouraged their families to plant gardens and try the recipes they’d used at school.

Listening to the Voices of Change Agents

As the guest reader finishes the book about Isatou Ceesay, the third graders are full of wonderings:

“I wonder how many plastic bags are thrown away in our town.”

“I wonder if anyone in our town knows how to make things with plastic bags?”

“I wonder if people would use reusable bags if they had to pay for them?”

“I wonder if we could find a way to not use as many plastic bags?”

Excited by the children’s questions, the guest reader worked with the classroom teacher to brainstorm ways to continue encouraging the children to explore their connection to the use of plastic bags. The organization Rural Action was suggested as a possible partner. Perhaps students could write to a city council member with questions about the proposed fee for bags.

Community partnerships such as the ones described above can create place-based experiential opportunities for young children that localize issues of equity and collaborative civic agency. By pursuing partnerships with local entities with overlapping educational missions, teachers may help students feel empowered as “citizen scientists”¹² and change agents. Identifying and pursuing local connections provides a developmentally accessible way to help children place themselves within a global context and provides attainable ways for them to engage as scientific advocates within their communities. By pursuing collaborations with community members and organizations, teachers may help to bridge the gap between informal-formal learning while also empowering their students to engage in local issues with global consequences. ●

Notes

1. Miranda Paul, *One Plastic Bag: Isatou Ceesay and the Recycling Women of Gambia* (New York: Millbrook Press, 2016).

2. Terry Husband, Jr., “He’s Too Young to Learn About that Stuff: Anti-Racist Pedagogy and Early Childhood Social Studies,” *Social Studies Research and Practice* 5, no. 2 (2010): 61–75.
3. Paul G. Fitchett and Tina L. Heafner, “A National Perspective on the Effects of High-Stakes Testing and Standardization on Elementary Social Studies Marginalization,” *Theory and Research in Social Studies Education* 38, no. 2 (2010): 114–130.
4. Rolf K. Blank, “Science Instructional Time Is Declining in Elementary Schools: What Are the Implications for Student Achievement and Closing the Gap?” *Science Education* 97, no. 6 (2013): 830–847.
5. NCSS, *National Curriculum Standards for Social Studies: A Framework for Teaching, Learning and Assessment* (Silver Spring, MD: National Council for the Social Studies, 2010); NGSS Lead States, *Next Generation Science Standards: For States, By States* (Washington, DC: National Academies Press, 2013).
6. Marilyn Boyle-Baise and Jack Zevin, *Young Citizens of the World: Teaching Elementary Social Studies Through Civic Engagement* (New York: Routledge, 2014).
7. Jennifer Lin Russell, Karen Knutson, and Kevin Crowley, “Informal Learning Organizations as Part of an Educational Ecology: Lessons from Collaboration Across the Formal-Informal Divide,” *Journal of Educational Change* 14, no. 3 (2013): 259–281.
8. Marc Behrendt and Teresa Franklin, “A Review of Research on School Field Trips and Their Value in Education,” *International Journal of Environmental & Science Education* 6, no. 3 (2014): 235–245.
9. Dana L. Zeidler and Sami Kahn, *It’s Debatable: Using Socioscientific Issues to Develop Scientific Literacy, K-12* (Alexandria, VA: NSTA Press, 2014).
10. U.S. Department of Energy, “Easy Energy Action Plan’s Checklist,” http://energy.gov/sites/prod/files/2015/04/f21/EnergyActionChecklist_English.pdf.
11. National Energy Education Development Project, “Elementary Energy Infobook” (2016–2017), www.need.org/elementary
12. Citizen Science Association, citizenscience.org.

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