



Elementary Civic Science Education: A Farm-University-Library Partnership

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Introduction

Environmental sustainability education is critical for current and future generations. Ellsmoor (2019) asserts that environmental education is the most effective tool in reducing environmental damage and promoting sustainable development. Although many recognize the need for environmental education, there is little being done to match the need in our society. Moreover, not only is there a need for teaching these concepts, but there is also a need for engaging students as “only about 40% of students reported an interest in topics related to ecosystem services and sustainability” (Merritt, Archambault, & Hale, 2018, p. 18).

Study Purpose

This *community-engaged research (CER)* partners with community stakeholders as rich knowledge sources (Moll, 2019), in developing a locally relevant pedagogical approach for elementary environmental sustainability education. -- and evaluates the impact of this approach implemented in a library story time. This study builds on previous research in elementary environmental sustainability education by implementing and analyzing a *civic science community engaged partnership* across a university teacher preparation course, regional farm, county soil & water conservation district, and public library. Findings here focus on the library event learning outcomes and future community engagement efforts. Implications for teacher education practice, policy, and research are offered, including in community-based settings.

Theoretical Framework

Search Methods

- Searched ERIC EBSCO in Fall 2021 as an expanded search using terms “elementary school or primary school or grade school” AND “environmental sustainability or environmental impact or environmental importance” AND “children’s books or picture books or children’s literature”
- Criteria for inclusion: Article relevancy for review purpose to identify recent best practices for engaging elementary students in environmental sustainability curricula, particularly through curricular use of children’s literature.
- With the above search criteria, there were 10 recent results from 2000-2018, with six to be particularly relevant for the purpose of the literature review.

Promising Practices

- When implementing environmental sustainability lessons across grade levels, teachers should connect learning to academic standards, check for evidence of prior learning, address misconceptions, engage learner interest through inquiry-based exploration of topic, and share learning via presentation.
- Children’s books and media may be supportive resources for engaging K-6 learners in rich discussions about environmental sustainability.
- Student led projects and research informed by instructional strategies -- such as project-based learning and place-based education -- have also produced meaningful discussions and learning around environmental sustainability.

Examples

- Schroth and Heifer (2017): Sample environmental sustainability lessons (K-2, 3-5) with children’s books to engage student interest: *The Lorax, The Giving Tree, The Oxcart Man, A Chair for My Mother, Stone Soup, The Little House, Redwoods, Arthur Turns Green, The Trouble With Dragons, Just a Dream*
- Merritt et al. (2018): Teachers engaged students in environmental sustainability inquiry projects, particularly related to “water systems, ecosystem services, and energy sources” (p. 25).
- Meade (2010): Engages Otaki Kindergarten students in gardening as a place-based study. Te Kōhanga Reo o Mana Tamariki learned traditional approaches for growing vegetables and became more connected to whānau culture.

Positive Learning Outcomes

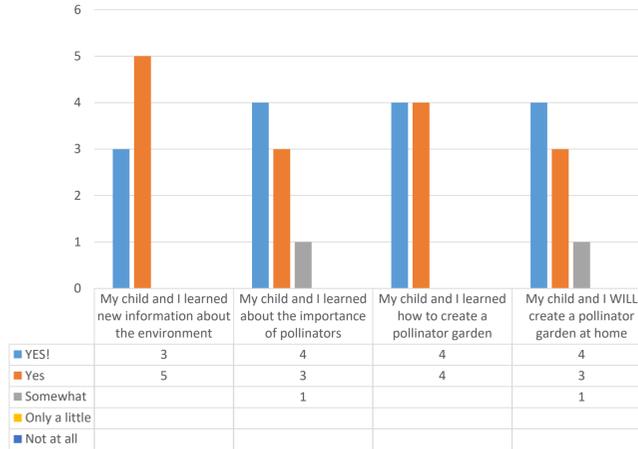
- Napoli (2011): Integrating quality environmental sustainability children’s literature into elementary curricula supported young readers in making positive changes in their world
- Meade (2010): Students introduced to environmental sustainability early in learning created confidence for later inquiry-based science lessons.
- Schroth and Heifer (2017): Students were able to connect their own experiences and knowledge to the environmental sustainability lessons and activities, and decided to “take action” (p. 15) in response to issues.
- Schroth and Heifer (2017): Elementary students with opportunities to learn about environmental sustainability topics demonstrated greater ability to recognize connections across academic disciplines, as a result.
- Jasinski, et al., 2014: Teacher candidates learned from elementary students already engaged in this work! Sixth grade students served as educators for partnering candidates learning how to integrate environmental sustainability education into Project Based Learning curricula. In return, the candidates supported the 6th graders in developing stronger research and writing skills.

Challenges

- Schroth and Heifer (2017): Challenges integrating sustainability education into curricula include identifying a good fit between content and grade levels; state academic standards supporting sustainability education; materials to support meaningful lesson plans; and effective instructional methods.
- Merritt et al. (2018): Environmental sustainability education must be relevant to the region, community and students. Curricula cannot be packaged to fit all school contexts.
- Meade (2010): Difficulty and importance of fostering a sense of agency in young students learning about sustainability issues. Play-based approaches and classroom community tasks, such as gardening, are helpful.
- Plankis et al. (2016): Moderate a play-based atmosphere with a critical, ethical lens in examining environmental justice issues.
- Jasinski et al. (2014): Emphasize that teacher education programs need to be willing to learn from K-12 teachers in environmental sustainability education, just as their program did when partnering with a 6th grade classroom already engaging in environmental sustainability education.

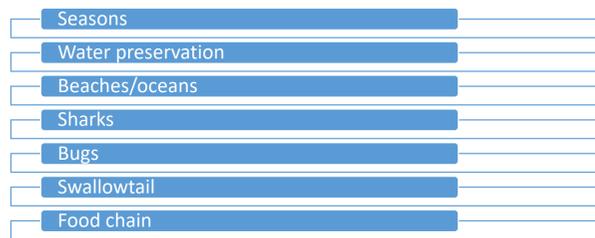
Quantitative Findings

Civic Science Story Time Parent Participant Survey on Child Learning

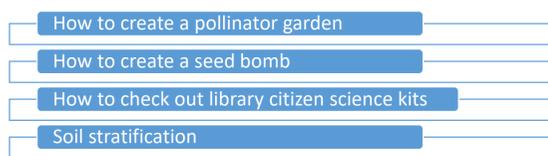


Qualitative Findings

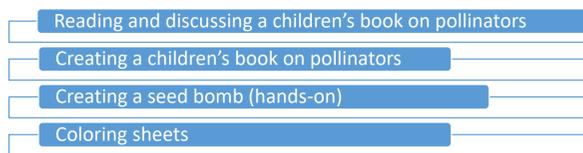
Parents: Future Environmental Topics for Library Story Time



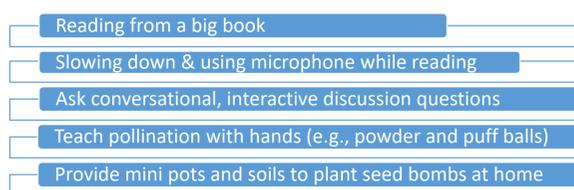
Librarians: What Participants Learned



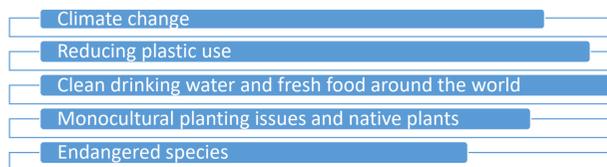
Librarians: Effective Storytime Strategies



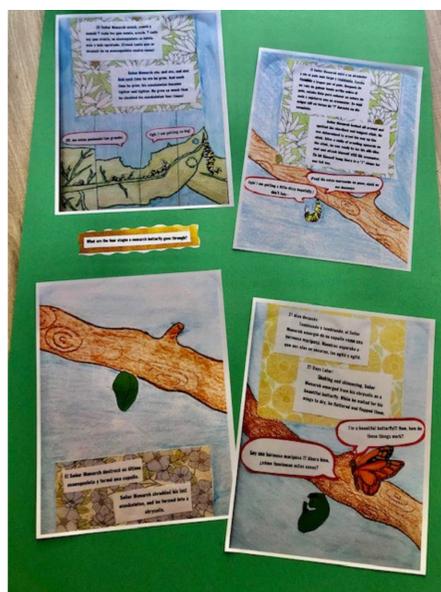
Librarians: Future Suggested Storytime Strategies



Librarians: Future Suggested Storytime Topics



Civic Science Children’s Book, BCSWCD Farm Visit, Library Story Time



Señor Monarch by Chanel Martínez and Lily Thompson



Farm Visit with Bartholomew County Soil & Water Conservation District



Bartholomew County Public Library Civic Science Story Time

Methods

Community Engaged Research

This study practices community engaged research (CER) shaping how data is collected and understood (Bay & Swacha, 2020). Community-engaged research is committed to “local, trans-local, and contextual analysis” leading to “social and institutional transformation” (Berman, 2008, p. 516). This study practices community-engaged research in that a primary focus is agency-building (Berman, 2008), relationship-building (Liu, in review), and “understanding the complexities of the human experience” more mindfully (Bay & Swacha, 2020, p. 136).

Community Engaged Project

Three elementary teacher candidates (candidates) who completed a university teacher preparation course on integrating science and social studies into the classroom, led a public library story time as part of the library’s community outreach for Earth Day. The candidates shared authored civic science children’s books on pollinators and their environmental significance after visiting a regional farm for a related presentation by the county soil and water conservation district. Books were aligned to academic state science standards, packaged as lesson plans with discussion questions BEFORE (check for prior knowledge), DURING (check for comprehension), and AFTER the story (encourage application). During the public library story time, teacher candidates shared their stories, led discussions, and guided family participants in developing their own mini children’s books providing instructions for how to create a pollinator garden at home. Participants left the library with their books and a packet of seeds to initiate this action step.

Data Sources: Surveys & Interviews

Candidates collected anonymous 5-question multiple-choice surveys to all participants after the library story time. In addition, candidates interviewed the supporting librarians in a focus group interview after the story time. The surveys took participants a few minutes to answer by circling choices provided. The surveys and interview invited feedback on the story time’s learning impact, challenges observed, suggestions for future civic science community engagement, including any environmental sustainability education content or engagement strategies for future library civic science community events.

Data Analysis: Mixed Methods

This study engages mixed methods research (Morse, 2003) including participant surveys after the library outreach (QUAN, QUAL), followed by a focus group interview with supporting librarians (QUAL).

Discussion & Implications

Implications for Teaching Practice

Pre-service teachers should learn approaches to environmental sustainability education in elementary classrooms (Merritt, et al, 2018) and learn from in-service teachers (Jasinski, et al, 2014). Teachers should integrate STEM children’s books into content-rich and engaging sustainability curricula and instruction.

Implications for Education Policy

School administrators need to support teachers in implementing sustainability education through fundraisers, grants, professional development, hosting community events on environmental sustainability.

Implications for Education Research

Future research should be conducted on how to integrate environmental sustainability education in elementary curricula and instruction in a meaningful way for diverse locations and interests of learners (Merritt, et al, 2018). Students and teachers are more likely to be interested in both learning and teaching about sustainability education if they see it as relevant to their communities. Thus, this study encourages community engaged research (CER) in teacher education that develops learning communities (Parkson, 2009) involving teachers, teacher candidates, faculty, and community partners in a mutual exchange of shared learning. While CER may be implemented in a variety of ways, the *partnership* must be central.

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