

Seeds for STEM: Participant Perspectives of Parent-Daughter, Garden-Based Learning Programs

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In the middle school years, students, particularly girls, might experience a decline in their enthusiasm or self-assurance when it comes to science-related courses, possibly influenced by stereotype threat stemming from societal expectations. (Britner & Pajares, 2006; National Science Board, 2016; Good, Aronson, & Inzlicht, 2003). Research suggests that by age 11 or 12, children may already be affected by stereotype threat, leading to poor performance (Aronson & Good, 2002; Steele & Aronson, 1995). Women and Latiné students are known to be underrepresented in STEM fields (NSF, National Center for Science and Engineering Statistics, 2015; Habig et al., 2020). This paper discusses the perspectives of participants in our intersectional-identity (pre- adolescent Latinas in science) programs, which bridge formal and informal science education settings, such as school district-based Saturday programs.

Yosso's (2005) Community Cultural Wealth (CCW) framework challenges deficit perspectives and emphasizes the assets that students possess. CCW identifies six types of capital that students have: aspirational, linguistic, social, navigational, familial, and resistant (Yosso, 2005). Over the past ten years, the concept of science capital has emerged as a unifying framework that encompasses various capitals, with the potential to generate value for individuals or groups to support their engagement, participation, and attainment in science (Archer, DeWitt, & Willis, 2014, p. 5).

Based upon our conception of Family Problem-Based Learning, the curriculum, “Our Plot of Sunshine,” challenges families to plan, plant, care for, measure and then harvest foods in seven weeks for the culminating tostada party. Separate parent and daughter Conversation Groups were a part of the programs, held in two different Western US states (Arizona and California).

Data sources for the project include pre, mid, post, and delayed post-surveys, demographic survey, parent-daughter interactions analysis, researcher observations, and focus groups. This paper reports on demographic data and participant perspectives from mid and post- surveys, which

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used a five-point Likert scale. Mid-surveys were administered at the four-week mark, and post-tests at the end of the seven-week program. Retrospective items were used to reduce response-shift bias. Paired items with "Before the program..." and "After the program..." were analyzed for statistical significance using paired t-tests (Klatt & Taylor-Powell, 2005).

The results of the program survey items suggest overall positive perspectives with each mean above 3. For parents, the item with the highest mean was about recommending the program to a friend, while for daughters it was the use of both Spanish and English in the program. For the retrospective daughter items, all differences in pairs were statistically significant ($p < 0.05$). The largest mean difference between the pairs was observed in liking the idea of doing science activities with parents and liking science. Overall data indicate positive views of the six pilot implementations by parents and daughters. They felt comfortable, supported, enjoyed working together, and would recommend the program. Participants noted that the activities promoted interaction and valued observing other families. This is supported by open-ended statements from participants.

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