Using a Student Garden as a Learner-Centered Teaching Tool in Higher Education

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Introduction/Connection to the Literature

Student empowerment has been shown to be integral to the learning process (Frymier, Shulman, & Houser, 1996). Specifically, when students feel empowered, they feel more competent in their learning activities, find these activities more meaningful, and feel they have an impact on the learning process (Houser & Frymier, 2009). Conger and Kanungo (1988) suggested that empowerment increases personal initiation, persistence in task completion, and feelings of self-efficacy. Self Determination Theory (SDT) identifies four task assessments individuals use when facing a task—meaningfulness, competence, impact and choice (Thomas & Veldhouse, 1990). When given academic choice related to learning activities that are meaningful, on which they can have an impact, and with which they feel competent, college students' feelings of empowerment have been shown to increase.

One innovative way in which student empowerment can be implemented is through a college garden. Recently, there has been a renewed public interest in food-related programs and initiatives in the United States (Enns, Martin, & Spielmaker, 2016). School gardens and associated educational programs have been shown to exhibit numerous educational benefits (Williams & Dixon, 2013). While recent research supports school gardens' specific connections to Science, Technology, Engineering, and Mathematics (STEM) related content (Kelley & Williams, 2013), other important outcomes have been reported in the literature including increased levels of food literacy (Nanayakkara, Margerison, & Worsley, 2018).

The purpose of this Learner-Centered Teaching presentation is to share how the Morningside College garden was used as an experiential learning tool to integrate "high-level cognitive activities and a more personal instructional design" (Edgar, Retallick, & Jones, 2016, p. 38). Specifically, this presentation describes how student choice led to a student-developed solution to several misperceived agricultural and food-based issues researched in an agriculture and food history course and emerged in the form of a learner-centered, college garden.

Background/Implementation of LCT

As the final project in the core *History of Food and World Agriculture* course, students developed a grant narrative following USDA/AFRI Food Challenge Grant requirements and aligned with the Morningside College's mission statement to solve multiple food-related issues presented in the course. Five of seven student groups independently focused their narrative upon developing a college garden. With this foundation in student choice, the course instructor co-wrote and received a $10,000 match grant from a statewide health insurance foundation, which funded the startup of the Morningside College garden. A one-acre garden with in-ground and raised beds was constructed by students on campus with this funding. Additionally, students established a co-curricular, interdisciplinary club and secured supplementary financial resources through the Morningside College student government. The garden provided additional campus facilities for agricultural laboratory spaces, student-designed outreach activities, and service learning opportunities for students from ten different majors across campus. Students were empowered to make decisions through agricultural course lab activities, independent study research projects, and through paid and unpaid garden-related internships. Students collaborated with the campus food service coordinator and the executive chef to develop food safety protocols and market over 2000 pounds of produce which was served to their peers in the cafeteria.

Methodology

A census of students (N=170) who participated in Morningside College garden-based curriculum or co-curricular activities in its implementation year were surveyed to determine perceptions of their attainment of fourteen school garden outcomes (Diaz, et al., 2018) via an online, electronic questionnaire as part of a larger study. Following recommendations of Dillman, Smyth, and Christian (2014), 80 usable responses were received for a 47% response rate. Non-response error was addressed by comparing early and late respondents (Lindner, Murphy, & Briers, 2001) and no significant differences in responses were found. Diaz, et al.'s (2018) school garden program outcomes were developed through a Delphi approach which used a panel of experts and were recommended for use in garden outcome assessment—indicating instrument validity. Since no literature had yet been published at the time of this study using the outcomes for assessment, a *post hoc* test of instrument reliability was conducted. The immediate outcomes construct of the questionnaire was determined to have excellent reliability (α=0.98) as categorized by George and Mallery (2003). Care should be taken when interpreting the following results as they were implemented at a single institution. However, important information can be gleaned for similar institutions wishing to implement school garden assessment at the college or university level.

Results to Date/Impact

Student mean scores on 16 of the 18 measured immediate garden outcomes ranged between 4.01 and 4.62 on a 6.0 agreement scale. Highest rated items indicated that students increased their appreciation of the value of the local food system, understood the value of a garden, and understood the connection of the garden to other disciplines. When considering the student Self Determination Theory-based task assessments of meaningfulness, competence, impact, and choice (Thomas & Veldhouse, 1990) related to students' curricular and co-curricular involvement in activities of the Morningside College garden, it is evident that students were empowered as learners.

Future Plans

Eighty-two percent of respondents indicated their interest in participating in future garden activities. Most commonly identified activities included designing the garden layout, design and implement a compost structure, develop a risk management assessment, design and install a storage shed, and design and maintain a pollinator bed. Initial student response to the implementation of the Morningside College garden supports continued student empowerment in numerous curricular and co-curricular activities. Continuous use of intermediate and long-term, research-based school garden outcomes is recommended to guide future programming.

Costs/Resources Needed

Although the costs of implementing a campus garden can vary, the Morningside College garden was initiated with two abandoned lots owned by the college and a $10,000 grant from a health insurance foundation. Additional funding from student government of $5000 annually and an annual donation from the campus dining company to fund the cost of summer interns has been quite helpful. Gardens have the potential to use existing space and be quite cost-effective while at the same time providing a learner-centered, experiential learning laboratory for colleges and universities.

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