Research Poster

Implementation Year Impact of the Morningside College Garden: An Outcomes Framework Approach

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Introduction and Framework

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), positive impacts upon personal and moral development (Hoffman, Knight, & Wallach, 2007), environmental attitude (Blair, 2009), an increased level of food literacy (Nanayakkara, Margerison, & Worsley, 2018), and healthy eating and well-being (Ozer, 2007) have also been reported. Curricular, co-curricular, and outreach activities were designed and implemented using the Morningside College garden as an experiential learning tool to integrate "high-level cognitive activities and a more personal instructional design" (Edgar, Retallick, & Jones, 2016, p. 38). The purpose of this descriptive study was to determine the perceived impact of the [College] garden on participating students' attainment of fourteen research-based outcomes of college gardens. Diaz, Warner, and Webb's (2018) outcome framework for school garden programs served as the conceptual framework for this study. Built upon Wiggins and McTighe's (2005) backward design principles and Rockwell and Bennett' (2004) programmatic assessment principles, Diaz et al.'s (2018) framework was used to "provide a solid foundation for an outcome-driven school garden program" (p. 160).

Methods

A census of students (N=170) who participated in 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 described by George and Mallery (2003). Care should be taken when interpreting the results of this study as it was 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

One hundred percent of respondents' perception mode scores related to the attainment of *immediate* garden outcomes fell between *Somewhat Agree and Strongly Agree* on the six-point, scaled response questionnaire. Highly rated items indicated that students *increased their appreciation of the value of the local food system*, *understood the value of a garden*, *want[ed] to eat more nutritious foods,* and *improved their knowledge of the natural environment.* Table 1

displays the frequency and percentage of responses of the students' perceived level of outcome attainment for each of the fourteen items assessed.

Table 1
Student perceptions of garden outcome attainment by frequency and percentage

	1	2	3	4	5	6
School Garden Immediate Outcome	*f(%)*	*f(%)*	*f(%)*	*f(%)*	*f(%)*	*f(%)*
Increase my appreciation for the value of the local food system	4(4.0)	3(3.0)	3(3.0)	17(16.8)	**34(33.7)**	18(17.8)
Understand the value of a garden	5(5.0)	5(5.0)	2(2.0)	18(17.8)	**30(29.7)**	19(18.8)
Want to eat more nutritious foods	6(5.9)	4(4.0)	5(5.0)	**28(27.7)**	24(23.8)	13(12.9)
Improve my knowledge of the natural environment	5(5.0)	7(6.9)	5(5.0)	23(22.8)	**24(23.8)**	14(13.9)
Increase my knowledge of gardening best practices	6(5.9)	6(5.9)	7(6.9)	20(19.8)	**25(24.8)**	15(14.9)
Connect the garden to other disciplines	5(5.0)	5(5.0)	2(2.0)	22(21.8)	**30(29.7)**	15(14.9)
Increase my interest in growing my own food	6(5.9)	9(8.9)	8(7.9)	19(18.8)	**22(21.8)**	16(15.8)
Increase my knowledge of plant identification	5(5.0)	12(11.9)	1(1.0)	24(23.8)	**25(24.8)**	12(11.9)
Increase my knowledge of healthy eating habits	6(5.9)	10(9.9)	6(5.9)	**27(26.7)**	16(15.8)	15(14.9)
Understand the importance of eating healthy to promote wellness	6(5.9)	10(9.9)	7(6.9)	**25(24.8)**	23(22.8)	9(8.9)
Increase my knowledge of where food comes from	6(5.9)	9(8.9)	5(75.0)	**30(29.7)**	19(11.0)	11(10.9)
Increase my leadership and responsibility	6(5.9)	8(7.9)	4(4.0)	21(20.8)	**26(20.8)**	14(13.9)
Increase knowledge about nutrition	7(6.9)	14(13.9)	6(5.9)	21(20.8)	**22(21.8)**	10(9.9)
Foster a love of gardening	6(5.9)	8(7.9)	6(5.9)	**27(26.7)**	20(19.8)	13(12.9)

Note: 1=Strongly disagree, 2=Disagree, 3=Somewhat disagree, 4=Somewhat agree, 5=Agree, 6=Strongly agree. **Mode** indicated in bold.

Conclusions, Implications, and Recommendations

Evidence provided through initial student perceptions of the outcomes attained supports continued development of and student engagement in curricular, co-curricular, and experiential learning activities related to the Morningside College garden. This conclusion has implications for faculty and staff who develop future garden-based activities. Backwards design principles (Wiggins & McTighe, 2005) focusing upon predefined school garden outcomes (Diaz, et al., 2018) should be used. It is further recommended to consider longer-term outcomes for the [College] garden. Immediate, intermediate, and long-term research-based school garden outcomes should be considered so that program developers "have the potential to inform a comprehensive framework for school garden development and evaluation that…key stakeholders can adopt and implement to consistently demonstrate positive program outcomes" (Diaz, et al., 2018, p. 159-160).

References

Blair, D. (2009). The child in the garden: An evaluative review of the benefits of school gardening. *Journal of Environmental Education, 40*(2), p. 15-38. doi: 10.3200/JOEE.40.2.15-38

Diaz, J. M., Warner, L. A., & Webb, S. T. (2018). Outcome framework for school garden program development and evaluation: A Delphi approach. *Journal of Agricultural Education, 59*(2), p. 143-165. doi: 10.5032/jae.2018.02143

Dillman, D. A., Smyth, J. D., & Christian, L. M. (2014). Internet, phone, mail, and mixed mode surveys: The tailored design method (4th ed.). Hoboken, NJ, US: John Wiley & Sons Inc.

Edgar, D. W., Retallick, M. S., & Jones, D. Research Priority 4: Meaningful, Engaged Learning in All Environments. In Roberts, T. G., Harder, A., & Brashears, M. T. (Eds). (2016). *American Association for Agricultural Education national research agenda: 2016-2020*. Gainesville, FL: Department of Agricultural Education and Communication.

Enns, K., Martin, M., & Spielmaker, D. Research Priority 1: Public and Policy Maker Understanding of Agriculture and Natural Resources. In Roberts, T. G., Harder, A., & Brashears, M. T. (Eds). (2016). *American Association for Agricultural Education national research agenda: 2016-2020*. Gainesville, FL: Department of Agricultural Education and Communication.

George, D. and Mallery, P. (2003) *SPSS for Windows Step by Step: A Simple Guide and Reference.* 11.0 Update. 4th Edition, Allyn & Bacon, Boston.

Hoffman, A. J., Morales Knight, L. F., & Wallach, J. (2007). Gardening activities, education, and self-esteem: Learning outside the classroom. *Journal of Urban Education, 42*(2), p. 403-411. doi: 10.1177/0042085907340909

Kelley, S. S., & Williams, D. R. (2013). Teacher professional learning communities for sustainability: Supporting STEM in learning gardens in low-income schools. *Journal of Sustainability Education*, *10*(3), p. 327-345.

Lindner, J. R., Murphy, T. H., & Briers, G. E. (2001). Handling nonresponse in social science research. *Journal of Agricultural Education 42*(4). p. 43-53. doi: 10.5032/jae.2001.04043

Nanayakkara, J., Margerison, C., & Worsley, A. (2018). Senior secondary school food literacy education: Importance, challenges, and ways of improving. *Nutrients, 10*(1316), p. 1-16. doi: 10.3390/nu10091316

Ozer, E. J. (2007). The effects of school gardens on students and schools: Conceptualization and considerations for maximizing healthy development. *Health Education & Behavior, 34*(6), p. 846-863. doi: 10.1177/1090198106289002