

Using a Systematic Approach and Theoretical Framework to Design a Curriculum for the *Shaping Healthy Choices Program*

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ABSTRACT

Objective: To examine the use of a systematic approach and theoretical framework to develop an inquiry-based, garden-enhanced nutrition curriculum for the *Shaping Healthy Choices Program*.

Methods: Curriculum development occurred in 3 steps: identification of learning objectives, determination of evidence of learning, and activity development. Curriculum activities were further refined through pilot-testing, which was conducted in 2 phases. Formative data collected during pilot-testing resulted in improvements to activities.

Results: Using a systematic, iterative process resulted in a curriculum called *Discovering Healthy Choices*, which has a strong foundation in Social Cognitive Theory and constructivist learning theory. Furthermore, the Backward Design method provided the design team with a systematic approach to ensure activities addressed targeted learning objectives and overall *Shaping Healthy Choices Program* goals.

Conclusions and Implications: The process by which a nutrition curriculum is developed may have a direct effect on student outcomes. Processes by which nutrition curricula are designed and learning objectives are selected, and how theory and pedagogy are applied should be further investigated so that effective approaches to developing garden-enhanced nutrition interventions can be determined and replicated.

Key Words: nutrition education, curriculum development, garden enhanced, inquiry based, school based (*J Nutr Educ Behav.* 2015; ■:1-10.)

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INTRODUCTION

Dietary behaviors among children in the US represent a major public health concern. Recent data show that a high percentage of children are consuming inadequate amounts of nutrient-rich foods such as fruits and vegetables and many do not meet the recommended amounts of some nutrients, including

calcium, vitamin D, fiber, and potassium.^{1,2} Another area of concern is the continuing high prevalence of obesity among children and adolescents.³

To maximize the potential to improve children's dietary behaviors, experts recommend that school-based nutrition education interventions use multi-component strategies that address several levels of social organization

concomitantly (eg, individual, school, family, community).⁴ Nutrition interventions are thought to be most effective in preventing childhood obesity when they combine classroom education with environmental changes, incorporate nutrition and physical activity, and promote parental and community involvement.⁵ Greater improvements in nutrition- and health-related behaviors are demonstrated in programs that integrate theoretical models of dietary behavior.⁶ In addition, controlled trials in school-based programs using nutrition curricula enhanced by garden activities have demonstrated greater improvements in nutrition knowledge, consumption of vegetables, preferences for vegetables, and willingness to taste vegetables, compared with those without.⁷⁻¹¹

The *Shaping Healthy Choices Program* (SHCP) was developed to investigate the effectiveness of a multicomponent, school-based nutrition intervention. The objectives were to increase upper elementary-aged children's

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nutrition knowledge and use of reasoning skills; promote availability, consumption, and enjoyment of fruits and vegetables; improve dietary patterns; encourage physical activity; foster positive changes in the school environment; and facilitate development of an infrastructure to sustain the program.¹² These objectives were to be accomplished through nutrition education in the classroom, increased access to fresh fruits and vegetables in the school cafeteria, dissemination of family newsletters, expanding community partnerships, and the formation of school-site wellness committees.

A prerequisite to meeting these objectives was the development of a curriculum for upper elementary-aged students that integrated behavior theory and included garden-enhanced activities. Although several publications have cited positive nutrition-related outcomes of garden-enhanced nutrition interventions among upper-elementary children, the specific processes by which curricula used in these programs were developed have not been described in detail.^{7-9,13-15} Illustrative of this, descriptions of the curricula typically include a summary of main topics, duration, frequency and quantity of activities, objectives, behavior theory, gardening activities (ie, maintenance and harvest), and vegetables grown, but there is minimal discussion concerning specific approaches used to develop the curricula; without understanding such processes used, replication is difficult.^{7-9,13-15}

In support of the need for research literature describing specific curriculum development approaches, a review of garden-based nutrition education interventions concluded that future publications should provide more information about the intervention development and implementation to fully understand variations in student outcomes between programs.¹⁶ The purpose of the current article is to address this gap in the literature and describe the systematic, intentional processes used in the development of the curriculum for SHCP.

METHODS

The goal of the curriculum development process for SHCP was to design a sequence of learning experiences

for upper elementary-aged children to gain nutrition knowledge and advance their reasoning skills so they could make evidence-based decisions about their diets. To accomplish this, 4 researchers with expertise in the areas of nutrition science, nutrition education, inquiry-based education, curriculum development, and garden-based learning formed a curriculum design team. In addition, 8 undergraduate students majoring in nutrition science and clinical nutrition were recruited as volunteer interns. Researchers and undergraduate students worked together to develop and pilot-test activities with upper elementary-aged students.

The undergraduate students were each assigned the development of 1 curriculum module. Specifically, they were to develop 2 activities within each module: 1 classroom activity and a second activity designed for implementation in an instructional garden. The role of the researchers was to work closely with the undergraduate students in the development process by providing guidance, recommendations, and edits to curriculum activities. The contributions of the researchers ensured that activities met curriculum objectives, addressed educational standards, supported theoretical constructs, and were sequenced to build knowledge and skills over time.

The curriculum design team met weekly for 9 months. These 1-hour meetings were facilitated by the researcher with expertise in curriculum development and were structured so that team members participated in reflective practice. Specifically, team members presented current iterations of activities and engaged in discussions on challenges and successes experienced during curriculum development, pilot-testing, and revisions of activities.¹⁷

Before the curriculum development process began, researchers identified Social Cognitive Theory (SCT) and constructivism as the theoretical underpinnings for the curriculum activities.^{18,19} The primary SCT constructs chosen for the curriculum were behavioral capability, reciprocal determinism, and self-efficacy.¹⁸ Inquiry-based education and experiential learning, educational approaches rooted in constructivism, were the pedagogical strategies selected.^{20,21}

Curriculum Development Using Backward Design

The approach used to develop the curriculum was Backward Design.²² This 3-step process involves identifying learning objectives, determining acceptable evidence of learning, and designing activities to align directly with learning objectives and selected evidence of learning.

Applying the first step of Backward Design, specific learning objectives for the curriculum were selected within 3 key domains: dietary recommendations, nutrition concepts, and critical thinking skills. In addition, 3 overarching content areas were identified: introducing agricultural practices, supporting health through diet and physical activity, and using reliable resources to make dietary choices. Dietary recommendations identified for inclusion were based on the Dietary Guidelines for Americans 2010 (DGA) and *MyPlate*.^{23,24} Specific nutrition concepts were identified from *Nutrition to Grow On*, an existing evidence-based, garden-enhanced nutrition curriculum that has been used by other researchers when developing nutrition education interventions.^{7,9,25} Specific grade-level standards for the curriculum were identified to integrate relevant standards-based learning objectives. Standards addressed included California Nutrition Education Competencies, Common Core State Standards for Mathematics and English Language Arts, and Next Generation Science Standards.²⁶⁻²⁸

The design team then organized the learning objectives into activity modules based on nutrition concepts identified. Emphasis was placed on vertical organization, sequencing modules to provide opportunities to build knowledge and skills over time, and horizontal organization, connecting activities to real-world situations and the broader goals of SHCP.²⁹

Following the second step of Backward Design, curriculum design team members identified acceptable evidence of learning through the use of authentic assessment strategies. Authentic assessment involves real-world tasks that allow students to exhibit their understanding of knowledge and skills while engaged in an activity (eg, performance of a task; response

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