

Impact of Service-Learning Experiences in Culinary Arts and Nutrition Science

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A grant from a regional nonprofit organization for the 2012-2013 academic year facilitated the revision of an existing course learning objective in a Culinary Nutrition lab course—performing effective culinary demonstrations—to include a service-learning experience. This course is a graduation requirement in a research- and science-based Culinary Nutrition program at an area university. A service-learning program consists of three groups: faculty facilitating the experience, students enrolled in the class offering a service-learning experience, and a community partner who hosts the experience. Integration of the service-learning component into this lab course allowed university students to apply skills from their academic and culinary classes in a real-world setting by designing culinary and nutrition education demonstrations for students at an area middle school. This article focuses on the impact of student learning evaluated in spring and fall of 2014. The implementation of this service-learning experience created permanent changes in the course’s curriculum, which now serves as a model for other service-learning programming conducted at the university. This article addresses the reflection strategies, the evaluation process and the impact this experience had on student-learning outcomes.

Keywords: service-learning, nutrition science, culinary arts, curriculum design, demonstrations, experiential education

Introduction

Service-learning incorporated into curriculum instruction allows students to participate in an organized activity that meets a community partner’s needs and achieves the learning goals of the class content (Furco, 1996). Service-learning differs from regular instruction due to course learning objectives aligning with a community need while including a reflection component, provides further insight into the understanding of course content. This process allows students to become a pivotal part of organizing and executing class content and its applications.

This constructivist case study highlights the integration of a service-learning component into a university’s lab course specializing in culinary nutrition. This service-learning experience examines how a new meaning was constructed for the course learning objective, performing effective culinary demonstrations. Prior to inclusion of the service-learning component into this course learning objective, university students would conduct demonstrations for their peers. Within the first two weeks of this five-week course, students were given an ingredient list and instructions on how to perform a culinary demonstration, which provided university students with the resources they would need to conduct their first demonstration. After conducting the first demonstration for their peers, they are evaluated by the instructor and fellow classmates. A second

demonstration with revisions was again presented to the class.

The purpose of this assignment is for university students to demonstrate the ability to perform high-quality culinary demonstrations, articulating a connection between healthful eating and personal health while developing and refining presentation skills. The instructor and peers evaluate fellow classmates on how they conduct themselves during the demonstration, including introduction, time management, and their verbal and non-verbal communication, as well as audience interaction and the inclusion of a nutrition and culinary skills message. University students watch their taped demonstration video and are instructed to critique their demonstration and incorporate feedback from their peers and instructor. Prior to revising the course learning objective, university students would use feedback provided and conduct demonstrations a second time to the same audience. Although this allowed an opportunity to learn from their first demonstration while making modifications for their second demonstration, it did not allow the students to articulate a connection between healthful eating and personal lifestyle choices for a given audience.

By including a community partner, an area middle school, and revising the course learning objective with a service-learning component, the instructor provided an opportunity for university students to perform effective culinary demonstrations for diverse audiences. Data for this case study was collected from 28 university students, including journal writing and narrative descriptions. Data analysis revealed an understanding of how university students apply skills from an academic and culinary curriculum into a real-world setting and how student-learning outcomes are enhanced when using a service-learning approach.

Culinary Nutrition Discipline

Culinary nutrition allows the application of nutrition and food science principles to be combined with a mastery of culinary art skills. The goals of the Culinary Nutrition program at this university is the development of the skills students need to manage the delivery of nutrition services to diverse populations and incorporate nutrition theory into classical cuisine while assuring food service operations meet food and nutrition needs of a varied clientele. The mission of the university is to provide an exceptional education that inspires professional success and lifelong personal and intellectual growth while preserving a unique student-centered culture (Institution Website, 2015). This culture guides a teaching-focused environment that encourages appropriate scholarship, and offers relevant programs for maximizing student potential while enriching academic programs with experiential and work-integrated learning. Culinary nutrition graduates become training table chefs, registered dietitians, research chefs and food scientists, among other potential opportunities. The merging of these two fields allows for the rationalization of appropriate eating behaviors while providing an opportunity for practical hands-on application in the kitchen via tasting demonstrations (Condrasky & Hegler, 2010).

Culinary Nutrition provides a platform for engagement and interaction while combining culinary arts and nutrition science. Geiger and Werner (2004) conducted a study where undergraduate health education majors planned and delivered a health

lesson curriculum to elementary students in the community. These lessons focused on topics of nutrition and physical activity, using activities to teach concepts. Evaluation results showed positive ratings of undergraduate students' preparation of the lesson, along with knowledge of the health concept. The undergraduate students reported enhanced practical application of knowledge and skills (Geiger & Werner, 2004). Educational opportunities, such as this one, provide practical experiences for students studying nutrition to reinforce the relevance of classroom material to a community need. This practice offers the ongoing opportunity to provide curiosity and enthusiasm to a variety of community members. Students have the ability to use fresh ingredients and hands-on nutrition education curriculum focusing on food experiences and culinary applications in support of healthy eating behaviors (Walters & Stacey, 2009).

The Service-Learning Process

Service-learning is an umbrella term under which many activities and programs fall, rather than a narrowly defined practice with associated outcomes (Finley, 2011). Bringle, Hatcher, and McIntosh (2006) offer an operational definition:

Service-learning is a course-based, credit-bearing educational experience in which students (a) participate in an organized service activity that meets identified community needs and (b) reflect on the service activity in such a way as to gain further understanding of course content, a broader appreciation of the discipline, and an enhanced sense of personal values and civic responsibility (p. 12).

A service-learning program includes three groups: faculty facilitating the program, students enrolled in the class offering a service-learning experience, and a community partner who hosts the experience. Critical reflection is a component of service-learning that generates, deepens and documents learning (Felten & Clayton, 2008). During this process, students identify questions that arise from their experiences and link what they are learning in the classroom to their personal lives and long-term career goals (Eyler, 2001).

The quality of the service-learning experience appears to be a key factor for students in whether their participation has an impact on them. The design of a service-learning experience plays a critical role in determining its effectiveness (Astin, 2006). One framework that has been helpful in implementing effective service-learning courses includes a four-stage process: preparation, implementation, reflection, and celebration (Jenkins & Sheehy, 2011).

Preparation. Preparation involves identifying a community need and then establishing the objectives and resources for the service-learning project (Kaye, 2004). Service-learning experiences include developing measurable learning objectives (Phillips et al., 2013) and deepening the understanding of course content. This experience involves reciprocal collaboration among students, faculty and community organizations to fulfill these shared objectives (Phillips et al., 2013). Students develop a sense of ownership, assume more responsibility for a given project and begin to appreciate course content and its application more thoroughly. During this stage, students start to understand the connection of the learning objective to the community partner's needs.

Implementation. Implementation of service-learning includes establishing connections between the project and classroom material (Jenkins & Sheehey, 2011). Service-learning demonstrates the dynamic connections that develop through collaboration, reciprocity and diversity between the institution, the students and the community partner. Each of these areas bring different perspectives, expectations and values to the service-learning experience. Collaboration allows for mutually beneficial relationships between both the student and the community partner as they work towards a shared goal (Jacoby, 1996). Reciprocity allows students an opportunity to learn, creating a strong connection between academics and a community concern (Felten & Clayton, 2008). Diversity allows students to incorporate different perspectives and life stories as a component of their service-learning experience (Jacoby, 1996).

Reflection. Reflection focuses on evaluating the course and the student's practical applications. Reflection methods vary, and include (but are not limited to) journaling, videotaped interactions and focus groups. The reflection component links experience to learning (Bringle & Hatcher, 1999) and is oriented toward specific objectives (Zlotkowski & Clayton, 2005). An example of an approach to critical reflection is the Determine, Examine and Articulate Learning (DEAL) model for Critical Reflection (Ash & Clayton, 2009). The DEAL model consists of three sequential steps: description, examination, and articulation of learning. As students engage in the classroom, it provides the opportunity to create narrative descriptions of the experience from an objective perspective. Learning objectives are examined to enhance the process for a specific class (Ash & Clayton, 2009). Learning is articulated and course objectives are reviewed for future opportunities. Reflection components allow students to ask questions and exchange ideas about the subject matter and relate their service to class content.

Celebration. Kaye (2004) defines the final stage, celebration, as allowing students the opportunity to discuss and exhibit their project through displays, performances, presentations and sharing stories. This provides an opportunity for validation among the students and community partners. The instructor can provide class time to discuss and celebrate accomplishments (Jenkins & Sheehey, 2011) with a variety of stakeholders, administrators, prospective students, fellow faculty and additional community members. This usually occurs at the completion of the course. This four-stage framework used in implementing the current service-learning experience is explained in the discussion and implications section.

Higher Education and Service-Learning

Service-learning has been used in a variety of higher education settings and across several disciplines (Astin, 2006). Research on the influence of service-learning in higher education has predominantly focused on the capacity of service-learning to achieve educational objectives (Wang, 2007). There are several reasons why service-learning should be placed in a particular curriculum, including building and strengthening disciplinary knowledge and skills, supporting student developmental stages and institutionalizing service-learning (Phillips, Bolduc & Gallo, 2013). These reasons promote student enrichment of the given discipline in a capstone course. Students are

allowed an opportunity to explore academic majors via hands-on experiences in order to understand career potential while discovering their sense of purpose (Phillips et al., 2013).

Theoretical Framework

This service-learning experience uses Kolb's theory of experiential learning as a framework to explain the implications of how knowledge creates experience. Kolb (1984) defines learning as "the process whereby knowledge is created through transformation of experience" (p.12). Kolb identifies learning as a four-stage cycle consisting of concrete experience (CE), reflective observation (RO), abstract conceptualization (AC), and active experimentation (AE). Concrete experiences serve as the basis for observations and reflections. These reflections assimilate into abstract concepts from which new implications for action are tested. They serve as guides in creating new experiences (Kolb, Boyatzis, & Mainemelis, 2001). Based on individual preferences for these stages, four learning styles emerge. These include converging, or thinking and doing (AC and AE); diverging, or feeling and watching (CE and RO); assimilating, or thinking and watching (AC and RO); and accommodating, or feeling and doing (CE and AE) (Evans, Forney, Guido, Patton, & Renn, 2010).

Kolb's theory allows an understanding of learning and flexibility at a deeper, yet more comprehensive level. It provides guidance for applications to assist students in designing and improving processes for their education and development. By understanding and challenging students' learning styles, classroom environments and activities are enhanced, allowing students to understand their own learning process (Evans et al., 2010).

Hands-on culinary skills education can cultivate behavior change by enabling students to apply abstract nutrition concepts to concrete experiences with foods. Nutrition knowledge alone is incomplete without the experiential learning that occurs when students have the opportunity to interact with food and culinary ingredients in a practical atmosphere (Nelson, Corbin & Nickols-Richardson, 2013). This service-learning experience allowed participants the chance to challenge their learning styles and apply what they experienced in the classroom to a real-world setting. I will address these learning styles in the discussion and implications section.

Methodology

Using a constructivist epistemology, revision to the course learning objective, performing effective culinary demonstrations, constructed new meanings for university students and the instructor in the university's culinary lab course. Constructivists believe meaningful reality is contingent upon human practices and is constructed during interaction between human beings and their world (Crotty, 1998). This service-learning experience used a bounded system, consisting of students enrolled in the culinary lab course during spring and fall of 2014. This case study focuses on a bounded system and is ideal for exploring complex social units with multiple variables housed in real-life situations (Jones, Torres, & Arminio, 2006).

The culinary lab course is a graduation requirement for the Bachelors of Science in Culinary Nutrition program at this university. This program receives accreditation through the Accreditation Council for Education in Nutrition and Dietetics (ACEND) in a Didactic Program in Dietetics. ACEND is The Academy of Nutrition and Dietetics' accrediting agency for education programs. Knowledge requirements are used to provide a template for on-going assessment of core competencies for accredited programs. This course addresses three knowledge requirements in its course content: the curriculum must include opportunities to develop a variety of communication skills sufficient for entry into pre-professional practice; the curriculum must include the role of environment, food, nutrition and lifestyle choices in health promotion and disease prevention; and the curriculum must include the principles of food preparation and application to development, modification and evaluation of recipes, menus and food products acceptable to diverse audiences.

Additional course objectives during the five-week course include: evaluate and produce high-quality, nutritionally sound foods while demonstrating the ability to control food costs; demonstrate proficiency in basic and advanced cooking techniques; design menus and plate presentations in compliance with the spa cuisine model; apply effective team building and leadership skills in culinary applications and perform effective culinary demonstrations. This last course learning objective was the focus of this service-learning experience.

Participants

A grant from a regional nonprofit organization for the 2012-2013 academic year allowed revision of an existing course learning objective—performing effective culinary demonstrations—to include a service-learning component. Using this grant opportunity as a springboard, collected data focused on the impact on student learning when adding a service learning component to this course. Participants selected were majoring in the Bachelors of Nutrition in the Culinary Nutrition program, and all participants enrolled and received course credit for the culinary lab course during the spring and fall 2014 trimesters. The community partner in this project was an area middle school. This partnership was formed in 2011, and the university has collaborated with this school on past projects. The middle school implements a unique program design, emphasizing project-based learning that includes an environmental and social sustainability focus. This school uses all disciplines to lead the way to a sustainable and green future (Denver Green School, 2015).

University students can enroll in the culinary lab course once they obtain junior or senior status. All participants had completed the requirements for the Associate in Culinary Arts program at the university or an equivalent degree and were between 21 to 31 years of age. Fifteen of the 28 participants had previously worked with children and teenagers in several different capacities, including working or volunteering with Boys and Girls Club, Cooking Matters, tutoring, camp counselors and sports team instructors. Three of the 28 participants had conducted formal demonstrations by themselves for a given audience. None of the participants had completed and executed a comprehensive culinary demonstration that included a lesson plan component.

Each of the 28 university students selected a nutrition topic and then developed a culinary demonstration that included nutrition education and a recipe development activity for seventh grade middle school students. Twenty-eight demonstrations were conducted for ninety middle school students. Before culinary demonstration lesson plans were organized, the university students met with the middle school faculty, who provided information about the school, curriculum, climate in the classroom, and answered any other questions. University students prepared a one-hour lesson that included a pre- and post-test, an introduction to the topic and its application for food preparation, and taste testing. Topics included: *All About Fat-Soluble Vitamins*, *From Farm to Table: Using Local Ingredients*, *Designing Balanced Plates—Focusing on Carbohydrates, Proteins and Fats*, *Vegetarian Diets*, *Colorful Plates: Focusing on Fruits and Veggies*, *Understanding Antioxidants*, and *Choosing the Right Foods Before and After Exercise*, as well as recipe development.

The lesson plan template used by the university students states specific learning objectives: develop an icebreaker activity and introduce the topic; explain materials used; provide a nutrition lesson with the culinary demonstration content; and provide a practical application of the nutrition lesson for the given audience. At the end of the service-learning experience, university students hosted the middle school students and middle school faculty in the university kitchens, highlighting their culinary skills demonstrating their knowledge about nutrition, and sharing thoughts about their experience. This culminating celebration allowed middle school students the opportunity to reflect on their accomplishments and work alongside university students in state-of-the-art culinary kitchens.

Data Collection

Data collection included reflection activities such as journal writing and narrative descriptions. All information, including reflection activities, lesson plan templates and logistics, were provided in a service-learning booklet designed by the instructor and distributed on the first day of class. This booklet provided concise information to guide university students through the service-learning experience. Since additional learning objectives are included in this course, the booklet provided clarity for the course learning objective that included a service-learning component. Reflection activities and evaluation opportunities took place during the course. The DEAL model for Critical Reflection framed the reflection process (Ash & Clayton, 2009).

Data collection occurred three times throughout the course. The first data collection was when the university students reflected on the overall service-learning experience prior to their demonstrations. These reflection questions highlight concrete experiences that serve as a basis for observations and reflections for this service-learning experience (Kolb et al., 2001). The second data collection time was when the students evaluated themselves within 48 hours after their demonstrations and initial interaction with the middle school students. These reflection questions highlight reflective observation, and focus on understanding the meaning of ideas and situations by observing and describing them while engaging in the experience and observing others (Kolb et al., 2001).

The last set of data was the student’s recorded reflections on the overall service-learning experience at the conclusion of the course. These questions highlight abstract conceptualization and active experimentation (Kolb et al., 2001). They emphasize thinking about the experience and reflecting on how individuals can actively influence others by providing information on a given topic. Table 1 illustrates sample questions used for the first, second, and third student reflection opportunities.

Table 1. Reflection Prompts

Sample Reflection Questions	
Reflection #1:	<ul style="list-style-type: none"> • What experiences do you have that may impact your service learning work (personal background, volunteer experience, career goals, etc.)? • What excites you most about being here; what concerns you most about being here? • Describe your initial personal reactions to the site, the staff and the work you will be doing? • How does an individual benefit by being involved in the community? • Do you feel that your service-learning work will benefit you in the future?
Reflection #2:	<ul style="list-style-type: none"> • What was your overall impression of your presentation? • Was your presentation understood by the participants and how could you tell? • Was the body of the lesson sequenced in a logical manner? • Did your physical movements, facial expressions, verbal and non-verbal cues facilitate the presentation? • Do you feel that learner achievement occurred? • What things did you do well that you want to be sure to continue doing and how can you do better next time?
Reflection #3:	<ul style="list-style-type: none"> • What did you learn about the community through this experience? • What did you learn in the community that connected to the content of this course? • Do you think you will do anything differently as a result of your experience in this course? • Did you feel prepared to perform the work required of you? • If not, what would have made you feel more prepared? • What have you learned about yourself through your service-learning experience and what have you learned about others?

Evaluation tools included journal reflection entries and narrative descriptions tracked during the two course sections in the spring and fall of 2014. The instructor evaluated university students during their demonstrations and met with the class at the completion of the experience for additional narrative descriptions that were recorded and transcribed. Each middle school faculty member evaluated the student’s performance and overall service-learning experience after the culminating celebration. University students evaluated middle school students on content learned by giving them pre- and post-tests.

Data Analysis

Data analysis of these documents developed an understanding of how this service-learning experience supported the revised course learning objective and how it impacted student-learning outcomes. Journaling entries were reviewed and a line-by-line open coding format and axial coding was used to analyze data. This approach allowed the instructor and research assistants who contributed to the data analysis to discover relationships between codes and to generate categories and themes (Mertens, 1998). Open coding helped examine data for similarities and differences, and axial coding was used to make connections between categories and sub-categories (Priest, Roberts & Woods, 2002).

Trustworthiness

Establishing trustworthiness requires continuity and congruence among all elements of the qualitative research process (Jones et al., 2006). In addition, qualitative research must adhere to the elements of goodness, which requires alignment of epistemology, theoretical perspective, methodology, methods, participant selection, analysis and interpretation, and presentation. The constancy of data interpretation was intentionally promoted by the instructor and research assistants when they developed uniform coding to use when analyzing the various sets of data. This established and assisted in evenly applied formulating of findings during one-on-one meetings between the instructor and research assistants. This practice assisted in the alignment of qualitative research components, thus meeting the requirements of goodness.

Findings: Impact on Student Learning

After reviewing all documentation, three themes emerged. These included gaining confidence in teaching and leading others, organizational and time management skills, and impact on career goals. The new definition of the course learning objective constructed during this service-learning experience allowed for enhanced student-learning outcomes that will be discussed in this section. The instructor and participants revised the previous course learning objective, performing effective culinary demonstrations. The new learning objective highlights a learning goal: to perform effective cooking demonstrations that allow students to provide nutrition and culinary education to a community partner while including an increased understanding of nutrition and culinary knowledge application. This learning goal anchors learning objectives for this portion of the course, which include: Students will reflect and describe knowledge gained in academic settings and how this information can be applied to a community partner's educational needs; students will develop a lesson plan that can be carried out for the community partner; students will analyze or evaluate each other's lesson plans and provide feedback; and students will execute the lesson plan, reflect on the experience and receive feedback from the community partner. This revision was articulated and developed during class discussion occurring throughout the five-week course. In discussing student reflections in the following sections, pseudonyms have been assigned to protect student's identities.

Confidence in Teaching and Leading Others

Several university students felt this experience created new opportunities for gaining confidence in teaching and leading others. Most university students had been successful with teaching one-on-one, but not when working with different group dynamics. When asked what they learned from this experience, Peyton highlighted, “Every time I go in, I learn a little bit more about my own teaching style ... that only helps me to grow in my ability to teach others.”

University students involved all of the middle school students when it came to taking part in the demonstration and tasting of various ingredients. Anna observed that some middle school students would skip tastings and she used this as an opportunity to teach them something new.

Before I let them add an ingredient, I first made them clearly understand what the ingredient was and why it is good for them. This helped when I quizzed them on the ingredients at the end because as a team they were able to identify each ingredient correctly.

Overall, many university students thought this was a valuable learning experience on many levels, including how to organize curriculum and facilitate a lesson for others. University students also commented they learned from the middle school students they taught. There were wonderful stories from the university students about the excitement the middle school students had in making a food item on their own. Ben provided one such story,

Some of the students were surprised by how much they loved their salsa ... it was there first time ever making one. One group in particular was having a hard time getting the flavors right. I asked them to taste it again and think about what it needed ... they adjusted the seasoning ...one of the girls eyes literally lit up with excitement when it finally all came together. I congratulated them and high fived them.

By teaching others basic nutrition information, university students reinforced what they were learning in the academic setting. Tony stated,

I have learned that I am more confident about my knowledge of nutrition when I work with people who need help with it. I’ve also learned that people want to be more nutritious and healthy, but most times they just don’t know how. This experience has confirmed my passion for nutrition and helping others. I was starting to doubt it.

University students realized that if you can teach a lesson to a child, you could easily adapt it to an adult learner. Most demonstrations were more effective when university students provided additional opportunities for hands-on applications with the middle school students.

Organizational and Time Management Skills

University students who chose to conduct simple demonstrations that fit into the time allotted acknowledged middle school students retained more content from the overall experience when comparing middle school students’ pre- and post-test answers.

They were able to incorporate a topic and show its application via a culinary hands-on demonstration. They were able to have closure, allowing both university students and middle school students an opportunity to reflect on the experience. This allowed university students to gain understanding of time management and organization when conducting demonstrations and education activities, including the practicality of some exercises versus others. Alexis highlighted,

I have decent people managing skills to begin with but managing children is totally different. The one group I worked with was able to follow directions and I mostly just added techniques.

One university student believed the single most important assignment associated with this experience was the lesson plan. With prior planning of the demonstration, university students were more confident when they entered the middle school classrooms. Those who had spent more time organizing their ingredients, equipment and nutrition education material provided demonstration activities that ran smoothly. Many university students believed this assignment made them work outside of their comfort zone. When asked if they felt prepared to perform their demonstration and education activity, William indicated,

I did feel very prepared! I liked the openness of the assignment, as it allowed me to have a vision for what I wanted to teach and bring it into reality. I love having requirements set for me, so having to go and make my own requirements and having to organize myself was an enjoyable challenge.

Career Goal Impact

This experience made several individuals reconsider their career path. These university students hope to become registered dietitians, and anticipate using their knowledge to teach people in their community about proper nutritional guidelines. Sean highlighted,

I learned that the community is in need of programs to educate them on proper eating and nutrition. I learned that although I get nervous, I really enjoy teaching and working with younger generations...I would like to focus on prevention... and believe educating our youth is the key.

Interacting with others in the community and practicing demonstrations helped university students understand how to approach nutrition messages differently so consumers can be excited about food and nutrition. One university student, Mikaela, thought differently about her involvement in the community after this experience.

Being in this course has pushed me to be more proactive about getting involved in the community and doing demonstrations more frequently. I am definitely thinking differently about my career. I would really like to do more with kids and teaching about nutrition and food in the community.

Another university student, Zach, described his experience with the middle school as influencing goals for his future career. This experience reinforced his desire to help

others connect with food in a meaningful way. “This is something I have wanted to do for a long time and now I just have a clearer view of how to do that.”

Discussion & Implications

Prior to revising the course learning objective, university students would use feedback provided from the first demonstration, and then conduct demonstrations for a second time to the same audience. Although this repetitive practice gave students an opportunity to learn from their first demonstration and make modifications for their second demonstration, it did not allow students to meet the knowledge requirements set for this course. The instructor also noted most students were unable to articulate a connection between healthful eating and personal lifestyle choices for a given audience. The instructor provided an opportunity to perform effective culinary demonstrations for diverse audiences by including a community partner for this service-learning experience. This experience allowed many to improve their culinary demonstrations for an audience that they knew little about besides age and grade level as they prepared the second demonstration.

Theoretical Framework Connection

This service-learning experience corresponded with Kolb’s experiential learning theory stages. Revising this course learning objective allowed for concrete experiences that served as the basis for observations and reflections. Learning styles were challenged when university students reflected on observations made during their initial contact with the students. Abstract conceptualization occurred when university students thought about their lesson plan and the material that would be the most appropriate to include when delivering their message. Abstract conceptualization allowed university students the opportunity to discuss with their peers and the instructor what the active experimentation, or the doing stage, would look like. Most university students had not previously developed a lesson plan and executed it for a target audience. By experiencing applications associated with teaching and leading others, the university students created a new way of thinking about this practice.

Service-Learning Process Framework

Based on the framework introduced by Jenkins & Sheehy (2011), this revised course learning objective utilized the four stages of preparation, implementation, reflection and celebration to guide integration of the service-learning experience. University students had the opportunity to prepare themselves for this experience by reviewing the service-learning booklet provided by the instructor. They met with the middle school faculty prior to developing and executing their demonstration to gain understanding of the mission of the school, the climate of the classroom and the learning objectives of the middle school curriculum. The university students had an opportunity to discuss their lesson plan ideas with the middle school faculty to ensure they were congruent with the current class content.

University students were able to implement their lesson plan with both the culinary applications acquired from their Associate in Culinary Arts degree program and the academic content they learned in the additional required courses. By practicing in-class demonstrations for their peers and instructor, students were able to reflect on their nutrition and culinary messaging and effectiveness of communicating this to their peers. This allowed them to prepare for live audiences when conducting their second demonstration. University students had opportunities to reflect on the process of developing a lesson plan and working with a community partner several times throughout the course.

University and middle school students had the opportunity to celebrate their accomplishments at the completion of the course. Middle school faculty and the parents of the middle school students, along with university faculty, administrators and staff, were invited to break bread with both sets of students at the university. This allowed middle school students to work in state-of-the-art culinary kitchens and have an opportunity to visit a university campus. Both sets of students engaged in “speed station” demonstrations. Groups of four middle school students paired with one or two university students and took part in three different demonstrations on topics such as: *Power Packed Smoothies*, *The Wonder of Whole Grains*, *Plant-Based Proteins are Fun*, *All About Veggie Chips*, *Functionality of Ingredients*, and *Basic Knife Skills*. The two sets of students and guests shared the recipes created. A video presentation highlighted the service-learning experience that occurred throughout the course.

Next Steps

Many university students commented they had previously completed community service activities, but the comprehensiveness of this project allowed them to see a more direct link between their classroom material and the application to a real-world setting. One university student’s advice for future students enrolled in this culinary lab course would be to have an activity that is interactive for all middle school students. The presentations he saw that did this seemed to be much more successful and entertaining to their audiences. Another university student suggested creating opportunities to further the existing relationship with the middle school. If a few university students went throughout the school year and conducted evening demonstrations with middle school students and parents, it would make for some interesting discussion back in the university classroom about the overall food knowledge of the local area. This would also connect class material to family nutrition and dietary habits. The class instructor highlighted that lessons could become more progressive and an organized culinary nutrition curriculum could be developed for other area schools.

The university is committed to furthering institutionalization of service-learning across the curriculum through its strategic plan. The university is dedicated to providing service-learning experiences to students and regularly engages with several local nonprofit organizations. The university implements an interdisciplinary approach to service-learning, ensuring opportunities exist in both academic and student affairs. Prior to this service-learning experience, few students had the opportunity to apply these skills directly to a particular course or career option. The instructor’s leadership

in integrating service-learning in a hands-on culinary application helps demonstrate that service-learning is not limited to the 'academic' colleges on campus but can be done in the strict confines of a five week course with a rigid curriculum structure. Culinary arts faculty have explored this in their own classes and the instructor presents service-learning work at local and national conferences, inspiring other faculty to consider including service-learning in their course content. Additional faculty and staff have applied for and received additional grant monies to support service-learning training and projects of their own.

Limitations

The class model for the delivery of this service-learning experience occurs over a five-week period. This model allowed for two exposures between the middle school students and university students. University students just start to develop a connection with the middle school students after two visits and many participants noted they would have appreciated a continued relationship with the community partner. Several participants found this to be a negative aspect of the experience. Some university students felt the service-learning component was rushed and could be organized differently, due to the short timeline of the course and other project requirements included in this course. A larger sample size might have allowed opportunities to identify additional themes from reflections and discussion, or reveal enhanced material to support the current findings.

Future Research

This service-learning program provides insight into future research opportunities. This is an example of the experiences for one university and two sections of one class in the Culinary Nutrition program. Within the Culinary Nutrition program, another required course includes a service-learning component. This class incorporates the comprehension and application of education and behavior change theories and techniques into an education session for a target population. If scheduling permitted, this service-learning opportunity could be a progressive part of these two courses. The development of a service-learning thread through the curriculum would allow students to build and maintain relationships with a variety of audiences, practicing effective oral and written communication while including the role of environment, food, nutrition and lifestyle choices in health promotion and disease prevention. University students could also include additional opportunities for techniques of food preparation and application to the development, modification and evaluation of recipes, menus and food products to diverse audiences.

Classroom delivery models are evolving, and higher education institutions need to consider where service-learning best fits into their curriculum. Culinary and nutrition programs can be an appropriate starting point to provide students with a hands-on experience addressing a community need. Additional avenues for research opportunities can be developed while reviewing the impact of service-learning within the community partner organization, such as food resources available to the middle

school students, cultural attitudes towards family involvement and the role of nutritional instruction in a larger school system.

Conclusion

The Culinary Nutrition program prepares its graduating nutrition educators and professionals to manage the delivery of quality nutrition services to diverse populations and assure that food service operations meet the food and nutrition needs of clients while participating in activities that promote nutrition and the profession of dietetics. This case study allowed the instructor an opportunity to challenge herself and her university students. As a facilitator of this service-learning experience, the instructor began to see the importance of active learning techniques. By providing space for the university students to talk about their experience, write about it, and apply it to their personal and professional growth and development, the revised course learning objective allowed university students to challenge their learning styles. By integrating service-learning into the program, university students can apply their academic skills into real-world settings in the community, ensuring they acquire professional skills that will propel them to personally satisfying careers.

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Acknowledgement

The author would like to thank the research assistants who worked on this project: Andrew Barninger, Katie Rushing, Emily Richardson, Alex Courtney, Meg Couture.

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