

# Engaging Students in Service Learning through Collaboration with Extension: A Recipe for Success with Community Partners



**Tammy J. Stephenson<sup>1</sup>, Laura Stephenson<sup>2</sup> and Lindsey Mayes<sup>3</sup>**  
**University of Kentucky**  
**Lexington, KY**

## Abstract

Service learning (SL) is a well-recognized teaching approach that integrates meaningful community service with classroom learning. Plate It Up! Kentucky Proud is a successful SL activity that connects student and faculty expertise with Family & Consumer Science (FCS) Extension agent programming. Students develop and test quality, nutritionally-sound, recipes using locally grown fruits and vegetables. Student interest in the project and knowledge of FCS Extension were significantly enhanced during the course of the semester. As well, 99% of students would recommend this project to a peer. On a scale of 1-7 (7=incredibly important), students rank the importance of real-life applications in coursework as  $6.31 \pm 0.97$ ; 35% of students would take a section of a course just because it incorporates such applications. Students developed their nutrition knowledge, team building skills and communication skills through the project. Agents also positively reflected on this collaboration with 100% of surveyed agents recommending the project to their colleagues. On a scale of 1-7 (7=incredibly interested), agents ranked their overall interest as  $6.40 \pm 0.52$ . This successful collaboration serves as an example of students, faculty and administrators engaging with well-established community partners to have a significant impact on community health and student learning.

## Introduction

Experiential learning is defined as occurring when students participate in a contrived “real life” activity, reflect upon that activity, use their critical analysis skills to derive useful knowledge, meaning

and insight from the experience and then incorporate their new understandings into their daily lives (Bohn and Schmidt, 2008). The meta-cognitive skills that students utilize while participating in experiential learning activities enable them to assess their true level of understanding and mastery for the subject matter. Service learning is a well-recognized form of experiential learning in higher education that emphasizes relating a community service activity to course or program learning outcomes through a mutually-beneficial activity and student reflection opportunities (Anderson et al., 2011; Querry and Smith, 2004). Service learning activities promote student learning and skill sets, enhance academic curriculum and foster strong relationships between campus and community (McDaniel, 1994; Ross, 2012).

Service learning projects have a long history of being particularly valuable in agricultural programs, including human nutrition and dietetics. There is an increased interest in expanding SL activities for these students as a means to address health disparities within communities (Cene et al., 2009; Marcus et al., 2011). Dietetic students report SL allows for greater learning by integrating classroom knowledge with real-life experiences (Kim et al., 2003). Service learning also promotes critical thinking skills, leadership skills and civic and social responsibility (Bailey et al., 2002). In an analysis of SL impact in a large enrollment introductory nutrition class it was found that students perceived they learned the information better as a result of the experiential learning activities and felt more confident in their ability to apply the knowledge to real-world situations. Senior dietetic students in a

<sup>1</sup>PhD, Senior Lecturer, Department of Nutrition & Food Science

<sup>2</sup>PhD, Assistant Director for Family & Consumer Sciences Field Programs

<sup>3</sup>BS, Graduate Teaching/Research Assistant, Department of Nutrition & Food Science

Medical Nutrition Therapy course worked in groups to develop interactive, educational modules on nutrition-related chronic diseases (e.g. heart disease, obesity) for training of Cooperative Extension Service agents in Louisiana. The majority of students felt the project promoted their professional development through cognitive and personal growth while also having a societal impact (Holston and O'Neil, 2008).

Service learning activities allow students to experience “real-world issues” in an applied classroom setting (Bonnette, 2006). In nursing students, undergraduate SL activities have been found to enhance the students’ academic, social and personal development at the same time as building partnerships with community organizations (Bassi, 2011). Service learning improves human nutrition student’s professional skills and allows them to have a greater appreciation for the role of nutrition professionals in community (Poehlitz et al., 2006). In health professions, integrating community based public health activities into the curriculum enhances student involvement in community service and fosters professional relationships between students, faculty and professional partners (Anderson et al., 2011; Gazsi and Oriel, 2010).

Bosma et al. (2010) determined that communication, shared decision making, shared resources, expertise and credibility, sufficient time to develop and maintain relationships, being present, flexibility and recognition of other partners’ priorities were essential to a successful partnership. Cooperative Extension FCS agents serve as an outreach arm of land-grant universities through community educational programs in consumer economics, food and nutrition and family sciences. While integrated within the land-grant college, programming rarely involves college students. However, by involving college students in community outreach opportunities through Extension a University can be truly engaged. An Extension-centered SL activity exploits the expertise of students, faculty, administrators and Extension professionals. Key reasons to consider Extension in SL activities are (1) agents have practical experience, (2) existing programs exist as models for success and (3) county-level contacts are already in place working with community groups (Morris et al., 2002). Extension faculty and professionals are well-recognized in their communities as trusted sources of research-based information (Mehta et al., 2003). Faculty developing SL activities benefit from the well-established county and state-level Extension infrastructure that is already in place. Extension collaboration with students and faculty on campus allows for innovative and timely

delivery of health education programming. The programming can be developed at little or no cost to local offices with students providing energy and mobilization for the project (Condo and Martin, 2002).

The objective of this project was to assess the student and agent perceived value of an Extension-based SL activity in an upper-level human nutrition and dietetics course at the University of Kentucky. This information will provide university instructors with student and community partner input to develop innovative, collaborative and relevant SL projects.

## Methods

### Course Description

The first author teaches the course “Experimental Foods” to junior and senior level dietetic and human nutrition students at the University of Kentucky (Lexington, Kentucky). Dietetics and Human Nutrition are high-enrollment majors at the University, enrolling over 500 students between the two majors. Experimental Foods is taught both fall and spring semesters with limited enrollment due to laboratory space restrictions. A total of 66 students were enrolled in the course during the Fall 2010 and Spring 2011 semesters. Experimental Foods teaches students about “*chemical and physical properties of food and the changes resulting from processing and preparation with experimental study of variations in ingredients and preparation methods on food quality.*” (UK 2011) The course is taught with a two-day per week lecture and one three-hour laboratory session per week with 20-24 students in each lab section. The pre-requisite for the course is “Principles of Food Preparation”, a course that prepares students in food preparation techniques through both theory and practical laboratory experience. The University of Kentucky houses a state-of-the-art commercial-grade kitchen for all laboratory courses.

### Service-Learning Component: Plate It Up! Kentucky Proud

Plate It Up! Kentucky Proud is a collaborative effort between FCS Extension agents, College of Agriculture administrators and human nutrition students and faculty. The project is fully funded by the Kentucky Department of Agriculture with three primary objectives:

1. Increase consumer purchase and preparation of Kentucky-grown produce.
2. Improve health of Kentuckians by increasing consumption of fruits and vegetables in healthy recipes.

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3. Develop a bank of University of Kentucky copyrighted recipes for FCS agent use in county programming.

Plate It Up! Kentucky Proud is an ongoing project initiated in Fall, 2009. Dietetic and human nutrition students in Experimental Foods were charged with the task of developing healthy recipes using Kentucky-grown commodities, primarily fruits and vegetables. Prior to the semester, FCS Extension agents provided the instructor with a list of over 50 recipes for possible modification. The instructor reviewed the recipes to determine whether they were appropriate for the scope of the class and 3-hour duration of the laboratory session. Those recipes deemed eligible were then collated in a notebook for student selection. Students worked with a lab partner or partners and self-selected one of the approved recipes. They evaluated the recipe for ways in which it could be improved from a nutritional, food preparation, or cost-saving perspective. Students were charged with the task of using locally-grown commodities and ingredients that are readily available in most Kentucky communities, both rural and metro. Course lectures, activities and assignments were designed to support the recipe development process. An FCS Extension agent on the Plate It Up! Kentucky Proud committee was a guest lecturer, reviewing the program goals and process, as well as answering student questions. Students worked in teams to research Kentucky grown commodities for presentation to the class. An initial recipe modification proposal was reviewed by the instructor, suggestions were made and a revised plan with materials requirements was developed. Once finalized, recipes were tested over the course of three weeks with changes made weekly to improve product quality. During each laboratory session the students prepared both the original and modified recipes with subjective and objective testing completed for each. On the final day of recipe testing, FCS Extension agents served as taste-testers. Agents came to the laboratory session early to interact with students and discuss recipe modifications. Then, students presented the original and modified versions of their recipe for agent evaluation. The agents met in the two weeks following the recipe testing period to discuss and rank the student recipes. Recipes that met the taste, cost and quality criteria of the agents were then re-tested by FCS Extension agents. The agents developed professional recipe cards, media scripts, video recordings and teaching materials for each recipe. Following the agent taste-testing session, students completed the nutritional analysis of both their original and modified recipe; modified recipes

with nutrition information were provided to the agents. With their lab partner(s), students developed a scientific paper describing their recipe modification, the theory to support that modification and subjective and objective testing results. The final stage of the project was student self-reflection.

As of the second year of the project, 100 recipes have been developed and tested by students over the course of six semesters. Of these recipes, 34 have been fully developed and printed as recipe cards and 89 have been included in the online searchable recipe database ([www.kyproud.gov](http://www.kyproud.gov)). Over one million recipe cards have been distributed by FCS agents in all 120 counties of Kentucky. The Plate It Up! Kentucky Proud project was selected as the spotlight program at the Kentucky State Fair Commodity Breakfast in August 2011.

## Student and Agent Evaluation

While a successful project in terms of outcomes and community impact, the investigators wanted to assess the project from a student and agent SL and collaboration perspective. This study was deemed exempt by the University of Kentucky Institutional Review Board.

Student perception of the SL project was assessed in a two-page written survey at the end of the Fall 2010 and Spring 2011 semesters. Anonymous surveys were distributed to all students enrolled in the Experimental Foods course. Sixty-six surveys were completed and returned. The instructor-developed survey evaluated students' perceptions of the SL project and FCS Extension collaboration. The quantitative component of the survey assessed student interest in the SL project, importance of interacting with agents, value of SL in coursework, usefulness of working in a group and skill set enhanced through the project. Qualitative questions evaluated knowledge gained from the interaction with FCS Extension and most and least favorite aspects of the SL project.

We assessed the value of this collaborative SL project from an Extension agent perspective in a two-page anonymous written survey presented to the 11 agents active on the Plate It Up! Kentucky Proud organizational committee. The instructor-developed survey sought both qualitative and quantitative agent input. The survey assessed agent years of experience, educational background, interest in the project, interest in collaborating with students and faculty, quality of student recipe development and presentation and project outcomes.

## Results and Discussion

Student and community partner feedback is essential to effective and sustained SL projects. Reflection validates the activity, fosters critical thinking skills and allows for continuous modifications to the project (Holston and O’Neil, 2008). Results from both student and FCS Extension agent assessment are presented.

### Student Assessment

Students provided primarily positive open-ended feedback on this SL project. A majority of students reported that they valued the “real-life” application of this project. They were both inspired and challenged by the realization that their recipes might become a part of the Plate It Up! Kentucky Proud brand. One student stated, *“The project was fun and educational at the same time. I learned how widespread the effects of our projects are on the community and what is important to include in a recipe.”* Another student stated, *“This was a great application of nutrition skills.”* These comments are consistent with those provided by the majority of students surveyed. When asked what the students liked least about the SL project their responses were consistently, “Having to write a scientific report” and “Taste testing recipes for three weeks in a row.” Both of these are a requirement for the course itself and not SL project specific.

Ninety-nine percent of students would recommend this project to a peer (Table 1). These results are similar to other nutrition-related SL projects, including a student-led nutrition education program for children called Kids Eat Healthy. The students reported that the project was a rewarding and beneficial experience that made them feel a sense of community responsibility, allowed them to take responsibility as a healthcare provider and enhanced their ability to provide nutrition education to children (Falter et al., 2011). Similarly, dietetic students at Northern Illinois University reported increased self-confidence in implementing nutrition education and an appreciation that learning extended beyond the text and classroom following a health-promotion class SL activity (Henry and Ozier, 2009).

Using a Likert-like scale of 1-7 (7=incredibly interested), students were asked to rate their overall interest in the project and knowledge of FCS Extension at the beginning and end of the semester

Table 1. Results of student survey (n=66) on service learning collaboration in Plate It Up! Kentucky Proud.

Survey Question	Response
On a scale of 1-7 (7=incredibly interested), how would you rate your overall interest in the recipe project at the <u>beginning</u> of the semester?	Mean ± S.D: 5.11 ± 1.46
On a scale of 1-7 (7=incredibly interested), how would you rate your overall interest in the recipe project at the <u>end</u> of the semester?	Mean ± S.D: 5.51 ± 1.20 *
On a scale of 1-7 (7=incredibly knowledgeable), how would you rate your knowledge of FCS Extension at the <u>beginning</u> of the semester?	Mean ± S.D: 2.32 ± 1.40
On a scale of 1-7 (7=incredibly knowledgeable), how would you rate your knowledge of FCS Extension at the <u>end</u> of the semester?	Mean ± S.D: 5.16 ± 1.11 **
On a scale of 1-7 (7=incredibly important), how important was interacting with FCS Extension agents for this project?	Mean ± S.D: 4.46 ± 1.54
On a scale of 1-7 (7=incredibly important), how important do you think real-life applications are in your college coursework?	Mean ± S.D: 6.31 ± 0.97
On a scale of 1-7 (7=incredibly important), how important was critical thinking in this project?	Mean ± S.D: 5.03 ± 1.04
If given a choice, would you take a section of a course just because it incorporates real-life applications?	Yes: 35%
How many of your other classes have involved real-life service learning activities?	4 or more classes: n= 6 3 classes: n= 8 2 classes: n=17 1 class: n=13 0 classes: n=22
Which of the following skills were enhanced through this project? <i>Check all that apply.</i>	Ingredient substitution knowledge: 95% Food preparation knowledge: 91% Use of taste-testing in product development: 91% Nutrient knowledge: 98% Team building: 84% Interpersonal communication skills: 86% Writing a scientific report: 82%
Would you recommend this project to a peer?	Yes: 99%

<sup>1</sup>Asterisks indicate statistically significant differences (\*\*) for (p<0.001) and \* for (p<0.05) between beginning and end of semester scores using paired t-test.

(Table 1). Both interest in the project and knowledge of FCS Extension were significantly enhanced (p<0.05 and p<0.001 respectively) during the course of the semester. This SL project brought higher visibility of Extension to the campus community. Similar to other’s findings (Condo and Martin, 2002), students who previously had not heard of Extension learned the value of Extension as an educational resource.

On a scale of 1-7 (7=incredibly important) students rated the importance of real-life application in college coursework as a 6.31 ± 0.97 (Table 1). Thirty-five percent of the students would take a section of a course just because it incorporates real-life applications. Two-thirds of the students had taken one or more additional classes that incorporated SL.

From an instructional standpoint, a SL project is only of value in the classroom if it enhances and promotes learning. Key student learning outcomes were evaluated (Table 1) with the majority of students reporting an enhancement in skills through this SL project. Nutrient knowledge, quintessential to dietetic

**Table 2. Student assessment of collaborating with peers and working in small groups (n=66).**

Score (Scale of 1-7 with 1=completely disagree and 7=completely agree)	Mean ± S.D.
The ability to collaborate with my peers will be necessary if I am to be successful as a student.	6.19 ± 1.16
I have a positive attitude about working with my peers.	6.11 ± 1.06
The ability to work with my peers is a valuable skill.	6.37 ± 0.92
In my career, I can be as successful working alone as working with others.	4.94 ± 2.07
Solving problems in a group is an effective way to learn.	6.07 ± 1.11
Group decisions are often better than individual decisions.	5.33 ± 1.48
Solving problems in groups leads to better decisions than solving problems alone.	5.38 ± 1.45

and human nutrition program success, was enhanced in 98% of participants. Ingredient substitution knowledge, food preparation knowledge, use of taste-testing in product development, team building skills, interpersonal communication skills and report writing skills were also developed. These findings support prior research at North Carolina State University where a diverse group of students engaged in a community food security SL experience (Chika et al., 2011). Students were engaged for three hours per week at a local food recovery program, recovering commodities from a farm and community garden program. In a post-project assessment, this multidisciplinary group of students had gained the ability to discuss the challenges of developing and implementing food security programs in the community.

Students worked with a one or two lab partner(s) on their recipe development. Students often resist small group work due to unequal distribution of work, different work styles and conflicting schedules (Hansen, 2006). These barriers to group work can be further exacerbated with large group sizes (Holston and O’Neil, 2008). We assessed student attitudes towards group collaborations (Table 2). On a Likert-scale of 1-7 (7=completely agree) students rated “The ability to work with my peers is a valuable skill” as a 6.37 ± 0.92. “The ability to collaborate with my peers will be necessary if I am to be successful as a student” (6.19 ± 1.16) and “I have a positive attitude about working with my peers” (6.11 ± 1.06) were also highly rated. Students recognized that they will not be as successful working alone as working with others. This realization is important for students who will be entering the healthcare profession where dietitians, physicians, physician assistants, nurses, pharmacists and therapists work together to treat patients as part of a “healthcare team”.

### Agent Assessment

Essential to the student, faculty, administrator and Extension collaboration are communication, project evaluation, sustainability, shared resources and positive climate (Borden and Perkins, 1999). Plate It Up! Kentucky Proud meets all of these criteria, with grant funding essential to the sustainability and development of the project. For a successful SL collaboration, the project experience should be mutually beneficial. Therefore, it is important to assess not only student, but also community partner opinion of the SL project.

Eleven FCS Extension agents on the Plate It Up! Kentucky Proud steering committee were surveyed in Fall 2010 in regards to their involvement in the project. One agent reported, “[The project] is a great experience – wonderful to see the labs and to see the students in action. Great to see interest in newly discovered foods and recipes.” According to a second agent, the project was an “Excellent experience to demonstrate the campus/extension partnership benefits.”

On a 7-point scale (7=incredibly interested), agents had an average interest in the project of 6.40 ± 0.52 with all agents recommending the collaboration to their colleagues (Table 3). Copyrighted recipe development (6.30 ± 0.95) and agent participation in classroom recipe testing (6.00 ± 0.94) were both important to agents. Agents reported participating in the project to: interact with students (67%), engage with faculty and administrators on campus (50%), ensure quality control in recipes (82%), and interact with other FCS agents interested in the project (50%). These findings are comparable to those from a community nutrition SL activity at 14 community agency sites in Colorado. When surveyed at the end of the project, 64% of the community partners were “strongly satisfied” and 27% were “satisfied” with the general quality of the student’s work. As well, 100%

**Table 3. Results of Family & Consumer Science Extension Agent survey (n=11) on service learning collaboration in Plate It Up! Kentucky Proud.**

Survey Question	Response
On a scale of 1-7 (7=incredibly interested), how would you rate your overall interest in the recipe development project?	Mean ± S.D: 6.40 ± 0.52
On a scale of 1-7 (7=incredibly important), how important do you think copyrighted recipe development is to FCS Extension?	Mean ± S.D: 6.30 ± 0.95
On a scale of 1-7 (7=incredibly important), how important is it for agents to participate in the classroom recipe testing?	Mean ± S.D: 6.00 ± 0.94
Why do you participate in the classroom recipe testing? (Check all that apply)	
% selecting each option	
To ensure quality control in recipes:	82%
To interact with students:	67%
To interact with other FCS agents interested in this project:	50%
To engage with faculty and administrators on campus:	50%
To learn more about the recipe testing process:	33%
Do you see a benefit of this recipe project to FCS Extension programming?	Yes: 100%

of the community partners wished to partner with the class again in the future (Sifford and Cunningham-Sabo, 2009).

Family and Consumer Science Extension agents were a valuable resource to guide the students on the needs of their diverse communities as this project introduced many of the students to the needs of a culturally and economically diverse clientele. According to Amerson (2010), there is a need to develop and enhance cultural competence in healthcare workers in the United States. In Kentucky, median family income is \$40,061, but median income by county ranges from \$21,177 to \$79,353 (U.S. Census Bureau, 2010). One-third of children in Kentucky live in single-parent homes. Student recipes had to meet the needs of this diverse clientele; students had to utilize ingredients that would be available in both rural and urban settings. The FCS Extension agents provided guidelines and support in the student efforts to ensure recipes were appropriate for a diverse population.

## **Summary**

This SL activity was guided by a mutually beneficial collaboration between faculty, students, administrators and FCS Extension agents. The academic partners provided project management, oversight of student involvement and research expertise to facilitate project assessment. According to Caspers and Vlasses (2009), academic research partnerships create a culture and system to support community agencies and excellence in programming.

Despite anecdotal evidence of its value in higher education, not all faculty are convinced on the benefits of SL in the classroom. Common criticisms of SL include it is an untested method, waters down the curriculum, takes away valuable time from faculty and students and takes significant funding (Gaster, 2011). Contrary to these common beliefs, this SL project was rewarding and valued by all involved, including faculty and administrators. Course content and materials were enhanced through this SL activity, providing a venue to engage and motivate students. Indeed, securing long-term funding has been instrumental to the success of the project. This funding was secured after a two-year cookbook recipe modification project with a separate community organization. This unfunded project allowed for the instructor to revise the course to incorporate a major recipe modification activity and to develop an effective protocol for community partnerships and SL-centered learning in the classroom.

As the project moves forward, student and community partner input will continue to be integral

to the project design. To further assess the depth of the students' learning and critical thinking, we will enhance the critical reflection component of the project through additional meaningful reflection activities, including weekly group discussions during the recipe testing phase of the project (Molee et al., 2010). Kessler and Burns-Whitmore (2011) recently reported that students benefit from a variety of reflection tools and that some students prefer one tool to reflect on self and another tool to reflect on community. They advise faculty to use creativity when developing reflection tools and that reflection can be drawing a picture, writing a song, scrapbooking, and panel discussion, not necessarily traditional, written journal entries. Future studies should continue to evaluate both student and community partner attitudes towards SL activities through meaningful and innovative reflection activities.

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