Research Interest

Ruyu and Emilie implemented an evaluation of the Illinois Junior Chefs Program, assessing participant outcomes using surveys and testing the feasibility of a hands-on cooking skill assessment as an evaluation method.

Abstract

Illinois Junior Chefs (IJC) is a nutrition education program focusing on hands-on cooking skills. The program targets youth aged 7-14 years that are from low-resource communities. In addition to pre- and post-program surveys, a skill testing evaluation method was implemented this summer. Overall results show positive changes in participant survey scores and cooking skills. Information gathered through this grant will be used to make further curriculum modifications.

Introduction

Children’s participation in cooking and food preparation is connected to stronger preferences for fruits and vegetables as well as healthier dietary intake (Chu et al., 2012; Chu et al., 2014). Because a large number of American children follow unhealthy diets and research indicates that children who cook develop healthier eating habits, hands-on cooking education programs can have a major impact on the health of American children. The Illinois Junior Chefs Program is designed to teach children how to cook and to also encourage healthy diets. After administering pre- and post-surveys to Illinois Junior Chefs participants and analyzing data collected during the summer of 2016, it was evidenced that the children in the program were
improving their attitudes and also increasing cooking time at home at the conclusion of the program, however, the change in eating habits was not significant. Using this data from the previous summer’s research on the Illinois Junior Chefs Program, we planned to modify the curriculum to incorporate a greater focus on the practice of hands-on cooking skills. We hypothesized based on the evidence that this addition could be the missing link to give kids the necessary skills to begin cooking healthier options at home, and thus changing their eating habits. To implement this change, we decided to address assessment of culinary skill development through hands-on testing in addition to through surveys which only generate perceptual self-efficacy. We also shortened the survey in order to encourage higher completion rates and to decrease survey fatigue.

**Our Tasks and Responsibilities**

We were actively involved in testing and curriculum modification, pilot testing, administering tests (collecting data), as well as data entry and analysis for this project. We pilot tested the survey with 27 participants locally and conducted cognitive interviews to ensure they understood the survey questions. The modified survey was administered immediately before and after the program to 217 participants.

We pilot tested the skills assessment protocol with 12 participants (aged 9-16) locally in Champaign. Before the pilot test, Emilie, Ruyu, their mentor Jessica Metcalfe and two other research assistants have tested the proposed recipes multiple times, aiming to find the most appropriate ratio that will be sufficient in testing corresponding skill sets. For example, ⅓ cup of flour might be enough to test one’s measuring skills, instead of 1 cup; 1 cup of water might cause the mixture to be excessively liquidy and place unnecessary and irrelevant challenges in the mixing step. We were able to develop a recipe using small amounts of very inexpensive
ingredients, which allowed us to shift a considerable amount of our funding toward mileage and gathering data from more classes and participants. Skill tests were administered twice, once on the first day of a program, immediately after the participants completed the pre-surveys. The second time of testing was at the conclusion of the program, after completing the post-surveys. The two tests were identical and 42 participants (aged 7-14) completed the skills assessment. Ingredients provided to participants included eggs, carrots, all-purpose flour, table sugar, and water. Kitchen tools displayed included silverwares, two types of peelers, measuring cups for dry ingredients, measuring cups for liquid, measuring spoons, bowls, spatulas, and graters. A recipe was also presented to participants. Participants were instructed to use any tools or ingredients at the stations. They also had the option to withdraw from the testing at any point. During testing, minimal instructions were given to the participants, except for the recipe, in order to prevent any potential learning and teaching effects. A checklist was used to assess performance, based on set criteria for each skill. Skills were worth a range of 2 to 6 points based on the number of criteria for the skill. Tested skills included cracking eggs, stirring, beating, folding, measuring liquids, measuring flour (using measuring cups and measuring spoons), peeling (using a peeler), and grating (using a grater). 0, 1, or 2 points were given for each skill tested. Pre- and post-test scores for specific skills please see Figure 1. Along with the administration of skill testing, also stayed to observe the full lessons to gather data on fidelity and any feedback the instructors might have.

Results

We have added questions pertaining to new cooking skills, and deleted survey questions that were no longer applicable or relevant. Shortened surveys have shown to take less time to complete. On average, the completion time was shortened from 11 minutes to 9 minutes. Some questions were adjusted based on the updated curriculum. Questions about grating, peeling and
citrus fruit juicing were added since those skills were integrated into the curriculum. This curriculum modification is based on the participants’ responses in the surveys in the previous years, which demonstrated outstanding self-efficacy for most of the skills in the old curriculum. Thus, new and more advanced skills were added to provide more appropriate and relevant education.

The cooking skills assessment protocol was determined to be feasible based on the successful data collection from 42 participants. Paired t-tests with cooking skills data indicated that participants experienced significant pre- to post-intervention changes in beating ($t(41) = 2.10, p = .047$), measuring flour ($t(41) = 4.76, p < .001$), measuring sugar ($t(41) = 1.46, p = .039$), grating ($t(41) = 3.52, p = .002$), and folding ($t(41) = 4.862, p < .001$) and non-significant positive changes in cracking eggs ($t(41) = 2.00, p = .057$), measuring water ($t(41) = .267, p = .792$), and peeling ($t(41) = 1.22, p = .236$). There were no changes in children’s stirring abilities because all participants were able to perform this skill at both pre- and post-tests.

![Pre- and Post-Test Cooking Skills Scores](image)

Figure 1: Cooking Skill Testing
Paired t-tests with survey data indicated that participants experienced significant pre- to post-intervention changes in cooking self-efficacy ($t(214) = 10.57, p < .001$), cooking attitudes ($t(211) = 5.17, p < .001$), cooking behaviors ($t(206) = 2.44, p = .015$), and self-efficacy for selecting and eating healthy foods ($t(205) = 4.37, p < .001$), and non-significant positive changes in fruit and vegetable preferences ($t(208) = 1.15, p = .253$).

![Pre- and Post-Program Survey Scores](image)

**Figure 2: Survey Testing**

**Future Research**

The Illinois Junior Chefs Program continues this year and the following year and we will continue to refine the curriculum based on information gathered this summer with the help of this grant. By working with this project through the assistance of the grant, we have gained experience in data collection and analysis as well as scientific writing for abstracts, posters, and
manuscript contributions. In April 2017 we both presented posters at the Experimental Biology Conference in Chicago IL and were selected as finalists in the American Society for Nutrition Emerging Leaders Poster Competition. We both plan to continue working on this project through data collection and analysis, abstract submissions, and manuscript contributions. We are currently preparing abstracts to send to American Society of Nutrition Conference as well as a session proposal submission for the Society for Nutrition Education and Behavior about hands-on cooking programs. Additionally, we are also working to develop a manuscript with collected data.