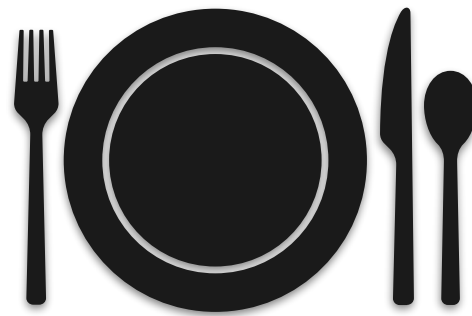


Cooking on Campus: A Comprehensive Proposal to Combating Obesity in College Students

Presented to the Faculty of the Department of Health Studies of the College
of Arts and Sciences

American University



Presented By:

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INDEPENDENT STUDY

INTRODUCTION / LETTER FROM THE AUTHOR

Hi. My name is Alexandra Epstein and I am a senior at American University in Washington, DC studying Public Health. Through my studies, I have learned about a multitude of diseases, how public health workers fought against the tobacco and sugar industries, and how the social determinants of health are so important in this line of work. At American University, I found a passion in defeating the obesity epidemic. I have started my career with internships with American University Dining (Aramark), The Partnership for a Healthier America, the United States Senate, and the Washington Redskins' Charitable Foundation.

This school year I started taking graduate level classes to count towards a Masters in Nutrition Education. I will graduate with my Bachelor's of Science in Public Health in May 2018, and with my MS in Nutrition Education in May 2019.

American University's Department of Health Studies taught me that we are the leaders of tomorrow and gave me all of the tools to become an effective and strong public health worker. Here, I have fostered my own Public Health service philosophy. My philosophy is that people need to have a passion for whatever they are working on or doing in their life. This philosophy will grow with me as I advance in my career. It is also how the idea of an independent study on decreasing obesity in college students through cooking sprouted. The idea for the independent study came from a mix of three different class assignments from spring and fall 2017 courses: Designing Health Games, Behavior Change in Health Promotion, and Lifecycle Nutrition.

For my independent study I created a curriculum for a six week cooking course for American University college students. The purpose of the cooking class was to go over basic cooking skills and techniques, how to manage a food budget in college and still cook nutritious meals, how to cook in a dorm, how to cook in general, and include guest speakers. The purpose of the cooking class was to empower students in the kitchen and their ability to cook healthy and nutritious meals for themselves.

From the idea conception, to the funding, operations, and the logistics of the entire course, this became my most fruitful experience in college. I utilized my education from the past four years in creating a pilot program that will hopefully offer proof of feasibility and interest to the American University administration to add a health and budget oriented cooking class to the University's curriculum catalog.

Communication with The Eagle, American University's award-winning student-run newspaper has commenced. A feature piece, by The Eagle staff, on the independent study and proposal is to be published in the Summer 2018 issue.

BACKGROUND INFORMATION & RATIONAL

Obesity is classified as a Body Mass Index (BMI) of 30 or higher. This refers to people who weigh 20% or more than their ideal weight based on their height. BMI is calculated by weight in kilograms divided by meters squared (American Heart Association, 2014). According to the Center for Disease Control and Prevention (CDC), more than one-third of the adults in the United States are obese. This is triple the obesity rate in the 1960s.

Obesity is a noncommunicable disease that is a leading risk factor for a number of other health issues, including many of the leading causes of the death in the United States. These diseases include heart disease, cancer, stroke, diabetes (type II), hypertension, sleep apnea, osteoarthritis, kidney disease, and high risk pregnancy (National Center for Health Statistics, 2017, National Institute of Diabetes and Digestive and Kidney Diseases, 2015). There are also social and cultural ramifications associated with being overweight/obese that could lead to mental health issues such as anxiety and depression in these patients (Caprio, 2008). Obesity does not only affects all areas of one's health, but also can decrease one's productivity levels, sense of well being, and overall quality of life. Obesity as a medical issue costs the nation more than \$150 billion in healthcare costs annually, and ranging from \$279-\$768 per person a year (State of Obesity, 2017).

There are many risk factors that lead towards weight gain and later on to obesity, such as lifestyle behavioral habits, age, family history, and sex. Examples of behavioral risk factors that affect weight gain are sedentary lifestyle, lack of physical activity, heightened stress, nutrition and diet, and lack of sleep. These habits are also are major protective factors in preventing the onset of becoming overweight or obese. For the purpose of this rational, this paper will focus on how diet and nutrition can effectively reduce the incidence rate of obesity.

The diet that one consumes can both negatively and positively affect one's risk for developing obesity. Not only is the amount of calories one consumes a factor, but also the type of nutrients and the nutrient-density of those foods. Fast food and portion sizes have contributed to an increased risk of obesity in American college students. Today's portion sizes are much larger than the calories one needs in an average meal, which cause people to eat more than what they need in a day. A person uneducated in nutritional needs is at risk of over-consumption of the macronutrients, and increased body fat. High fat and protein diets that are not fully utilized by the end of the day are stored as fat in the body (Galgani, 2010).

Types of foods are also important. Chips and other "junk food" do not offer nutrition to the body unlike fruits and vegetables (Harvard University, 2016). Not having a multidimensional and complete diet is a huge risk factor for obesity. Diet can also protect one against obesity through eating fruits and vegetables. The current USDA food guide, MyPlate, explains a healthy and round diet as halving half one's plate being fruits and vegetables, a fourth protein, and a fourth whole grains. This description allows for one to add in a variety of food that will build bones, muscles, maintain energy, and fight against diseases (USDA, 2017).

Obesity is an issue not just across the country, but especially in college students. College students are a growing demographic in America. According to the National Center for Education Statistics (2017), there was a 5.1 million student increase from fall 2000 to fall 2017. In the fall 2017 semester there were approximately 20.4 million college students in America. The percentage of 18-to-24-year-olds enrolled in college and university also was higher in 2015 (40.5 percent) than in 2000 (35.5 percent). (For the purpose of this paper the term “college students” will refer to those attending any 2-year or 4-year college or university.)

Obesity in America has been rising over the years, especially in college students. According to the American College of Health Association’s National College Health Assessment (ACHA-NCHA), the percentage of overweight and obese students rose from 21.9% and 9.5%, respectively, in spring 2006, to 22.9% and 13.9% in spring 2016. Currently, the Affordable Care Act allows the majority of college students to remain on their parents' medical insurance. Specifics of costs of obesity/obesity-related diseases in the college student population are unknown because the majority of students are on their parents' insurance until they turn 26.

College students are not currently seeing the economic burden of obesity in their pockets, but they will when they turn 30-50 years old and have a one of the diagnoses listed above, which point towards causes of rapid health decline. The morbidity of college students with obesity becomes a domino effect when they enter the workforce and continue to neglect their obesity (Sahoo, 2015).

It is important to focus on avoiding being overweight and obese early on in life because it can follow one throughout life and lead in an increased risk of chronic diseases in older adulthood. The American College of Cardiology (2015) reported that women in a 32 year cohort study that had a BMI of overweight/obese (25-30+) early in life (18 years old) were at 1.5-2 times greater risk for sudden cardiac death than women who had healthy BMI (21-23). Identifying the risk and protective factors of obesity within college students is imperative in understanding what is causing the massive increased prevalence rate within the population.

PROGRAM & PLANNING PROCESS

The creation of this independent study was supported by the department chair of the Department of Health Studies, the director of the Public Health Program, and the health education coordinator of the Wellness Center. The program of the six-week cooking class was created with supervision from the American University Wellness Center. During the six weeks, students learned how to cook different meals, how to plan a meal, meal prep, budget food shopping, and basic culinary skills.

The first order of business was to secure a time and location for the cooking class to occur. After researching locations with easy access kitchens with space to fit twelve participants, I reached

out to Kay Spiritual Life Center. A three and a half hour block of time was secured, every Wednesday from January 31 through March 7, 2018, at the Kay basement. The class would be held from 2:30-5:00 pm, so it would align with American University's scheduled class times. Wednesday was chosen since most freshman students do not have classes on the university's unofficially labeled "lab day." Starting the class after the first two weeks of the spring semester offered students the opportunity to become familiarized with their academic schedule and work load before committing to adding a two and a half hour block of time to their schedule. The class also ended the week before spring break. This was set up as a precaution against students deciding not to show up after spring break, and to not interfere with students' preparation time for final exams.

To fund the cooking class, I reached out to local grocery stores: Giant Foods, Whole Foods, and Trader Joe's, for in-kind and momentary donations. Within the University, I reached out to the Department for Health Studies, the Wellness Center, and American University Dining. I was awarded \$250 from the Department of Health Studies, \$500 from the Wellness Center, and in-kind donations from Giant Foods at Cathedral Commons, American University's One Card Office, and American University Dining.

BUDGET	WELLNESS CENTER	DEPARTMENT OF HEALTH STUDIES
WEEK	AMOUNT USED	
1	\$57.00	\$22.80
2	\$72.16	\$0.00
3	\$0.00	\$46.33
4	\$50.80	\$59.09
5	\$75.00	7.49
6	\$123.23	\$0.00
	\$378.19	135.71
TOTAL LEFT	121.81	114.29
TOTAL HAVE	\$750	

Table 1: Budget for Independent Study

Table 1 shows how I used the budget given to me from the Wellness Center and the Department of Health Studies (DHS). Since I tested the recipes before utilizing them in class, I purchased smaller batches of the ingredients with the money from DHS. I then utilized the budget from the Wellness Center to purchase the ingredients for the entire cooking class. If a smaller amount of an ingredient was needed than the volume of the ingredient purchased, I would utilize the same product item. For instance cocoa powder can in a 10oz can. However, I needed less than 10oz of cocoa powder for both the test and in-class recipes. Therefore, I only purchased one 10oz can. This is how the DHS budget total used is a smaller amount than the Wellness Center budget total used.

Thankfully, the Kay basement kitchen was already filled with the majority of the cooking utensils and supplies, including two ovens with four stove top burners each, and plates. Measuring spoons and cups, mixing bowls, paper goods (mainly eating utensils), frying pans, and spatulas were donated by the One Card Office. For cooking utensils that the Kay basement was short on and were not in the budget to purchase, I brought from home to class each week. These items included a blender, knives (with blade covers), and a can opener.

Over winter break 2017, I sent out a Google survey to American University students through class-specific Facebook pages. The survey allowed me to gain more information about AU students' views on dining options on campus, and their personal cooking skills. I also utilized the survey to gain insight on what students would want to learn in the six-week pilot course. At the bottom of the survey, participants were asked if they would be interested in taking a 0 credit, 2.5 hour pilot cooking course; if so, students gave their email addresses. This survey can be found in the appendix. After the first week of the spring semester, another Google form was sent out to university students. This form was to enroll in the cooking class, and was originally sent to those that expressed interest. The following week, the class started.

Each class was to be based on a different topic: vegetarian food, desserts, meal prep, healthy snacks, and how to remake take-out favorites. The specifics of each recipe were not determined after I met the students, so I would be able to tailor this pilot class towards their interests. I also organized a grocery store tour with the Giant Cathedral Commons in-store registered dietitian, and a tour and information session of AU dining options with AU's dietitian. I wanted to give the student participants the opportunity to apply the skills they learned in the first five weeks of the course to recipes of their own creation. The last class session (week 6) was scheduled to be a *Chopped* style cooking competition. The food would be judged by representatives of the main donors to the program.

INITIAL RESEARCH SURVEY

An initial research survey was sent out to American University students through Facebook to discover their current eating habits, cooking habits, and thoughts on on-campus cooking options. There were 100 respondents to the survey, with a grade demographic of 38% Freshmen, 15% Sophomores, 16% Juniors, and 31% Seniors. Of these respondents, 60% of them currently live on campus. Sixty-four respondents currently have a campus meal plan, with 34.4% having a 175-meal block (the lowest block a freshman student is allowed to have); 17% of respondents with meal plans have a 200-meal block, and 31.1% of respondents with meal plans have a 100-meal block.

Students were asked about their cooking habits. When asked where they learned how to cook, the three largest answers (in a "click all that apply" question), were at home (85%), self-taught (69%), and by social media (45%). Of respondents, 48% said they enjoy cooking, and 44% said they only sometimes enjoy cooking. Seventy percent of respondents said they cook because it is cheaper than buying food. There were multiple reasons students gave for not cooking, the largest

was “time,” with 53%. When asked if they like the on campus food options, 31% of students said, “No,” and 66% said they “like some places but not others.” This corresponds with the following question of students perception of the on campus food options being nutritious. Thirty-four percent of survey respondents believed that on campus food options were not nutritious, while 63% believed that some locations are, but not all locations have healthy options. It is important to know that of the survey respondents, 25% of them perceive that they know a lot about nutrition, and 45% of respondents know some information about nutrition.

Out of the 100 American University students that responded to the survey: 24% believe that college should teach students life skills, and it should be mandatory; 69% of respondents believe that life skill classes should be an option for college students to take at university; and 7% of respondents believe that college should not teach life skills. Of respondents, only 29% have taken a cooking class, but 39% would take one if it was offered, and 48% said “it depends,” to the opportunity to taking a cooking class.

The last four questions of the survey were used as a guide when creating the six-week cooking class. From these questions, it was found that American University students wanted to learn a variety of skills in a college cooking class. These skills include how to cook: chicken, food from different cultures, meals for the week, vegetarian and vegan meals, red meat, meals in the microwave; and other skills including how to use an oven, what spices to use, which pan to use, and how to make a full meal. Respondents also want to know what foods and how much food they should be eating, and how to know what to eat with a changing diet. The three most important items to respondents when choosing the food they eat are taste (38%), cost (26%), and nutrients (23%). Lastly, respondents had the option to add personal antidotes of what they would want to see in a college cooking class curriculum. These respondents had a high interests in learning how to cook for special dietary constraints including vegan, vegetarian, gluten free, kosher; how to ensure they receive all of the nutrients needed in a day; how to make filling, healthy, and tasty foods that would not make them feel lethargic or sick; and how to cook without a recipe.

Respondents also had the option to add a statement on why they feel passionate about why/how their eating habits are healthy or unhealthy. Below are excerpts from these statements:

“I get really upset about the eating options on campus, because there is little variety or nutritional value. The only potential for nutritional value is in TDR, but the meat is often served with a lot of fat, and the vegetables are often so much covered in garlic that you can smell it throughout the entire hall or are hidden in a stir fry. There are nearly no healthy options, especially no healthy vegetarian options, available with our meal plans.” - Nicole W.

“Since going vegetarian, I've become so much more conscious about what certain foods do to both my body and the environment. It's really surprising what's in food and where it comes from after you start examining what you eat.” -Bailey C.

“I’m vegan and value eating clean. It’s my number one priority.” -Martine D.

“Because I am a pescatarian and I feel like most of the time I do not get enough nutrients on campus.” - Eve Y.

“Food is our fuel and I want to put good things in to my body to have more energy and feel better in general.” -Chrissy M.

“As I enter a new phase of my life, I want to make sure to live a healthier lifestyle, especially when it comes to food.” -Maria J.

COOKING CLASS SUMMARIES

WEEK 1 - Introduction and Vegetarian Meals

The focus of this week was to learn what the students already knew, what they specifically wanted to learn, and to start their knowledge on nutritional information. After an introduction icebreaker, I shared with the students’ MyPlate. We all went around naming food in each quadrant. The meal of the day was creamy black bean taquitos and spicy cauliflower. The purpose of the meal was to show that vegetarian meals can be filling and have all necessary daily nutrients. The meal was also cost efficient and was able to be made for the entire week’s consumption.

WEEK 2 - Healthy Snacks

To reinforce the information learned in the previous week, the class took a field trip to Giant-Cathedral Commons. There, we met with the Giant in-store dietitian for the DMV area and learned how to go through a grocery store and what to look for in each section. The tour included the produce section, the fish/meat section, the outer bit of the simple carbohydrate section (pop-tarts and oatmeal area), and the dairy aisle. Each food group was discussed based on its nutritional purpose and how to eat the rainbow. The dietitian also discussed how to vary up one’s protein options to include plant-based protein in one’s diet. The food items for this were healthy trail mix and fruit roll-ups. Students had the chance to make their own trail mix and realize that it does not have to be store-bought. The roll-ups gave students the option to try different nut butters (cashew, almond, and peanut), and wraps (whole wheat, flour, and multigrain). These snacks are quick, easy, cheap, and delicious options for one to make in the dorms and have on the go. Students were given an extra 10 minutes to commute to Giant. Transportation was provided by the AU shuttle, Metro bus, and walking.

WEEK 3 - Meal Prep for the Week

This week’s focus was to teach students how to use the oven, make sheet tray meals, and to meal prep for the week. The original plan for this week was changed last minute after a mishap with AU Dining. This change in plans afforded the opportunity to show students how to create a meal

out of only what you have. From AU Dining, I received chicken, vegetables, balsamic vinegar, quinoa, and whole wheat pasta. We went forward with one of the planned meals creating balsamic vinegar and cinnamon chicken and vegetable salad. The students and I then came up with another recipe on the spot for the other chicken breasts. Looking through the leftover ingredients from previous weeks, the class decided on a coconut crusted chicken. We successfully created two different chicken flavors with 4 different vegetables, and two grains to create a variety of food combinations. The class learned about the calorie per gram count for the macronutrients, servings for specific foods (e.g. lean meats, normal meats, starch, etc.). We also discussed the benefit of purchasing specific food items in bulk to save money and what to buy only what you need of it.

WEEK 4 - Take-Out Favorites

The purpose of this week was to understand the high calorie count in restaurant take out food and how consuming these excess calories are stored in the body. The food for this week was General Tao's chicken and cauliflower pizza. However, Peapod did not let us know that they were out of cauliflower rice until they arrived with the groceries. Quick thinking was put into action and mini sweet potatoes were purchased from the farmer's market on campus.

WEEK 5 - Healthy Desserts

Week 5 was all about taming that sweet tooth, and receiving a balanced snack at the same time. To start the class, we took a tour of TDR with the campus Registered Dietitian (RD). She talked to us about the set up of TDR, the changes they are making to the menu and set up, and the healthy options that the students had access to. After the tour and short discussion with the RD, we returned to Kay to begin cooking. We made nice-cream, edible cookie dough, and avocado brownies. The nice-cream, was made out of frozen bananas, coconut cream, and flavoring. We added mint extract and chocolate chips to make mint chocolate chip nice-cream, and roasted hazelnuts and 100% cocoa powder to make Nutella nice-cream. The edible cookie dough was made out of chickpeas and peanut butter. The avocado brownies utilized avocados as the binder of the cocoa powder and coconut flour, to melt into a delicious brownie.

WEEK 6 - Food Competition

The students were split up into two teams to create a breakfast and lunch/dinner entree. They were able to utilize any of the food provided (which was a very wide selection) to create their meals in a designated time. They students were instructed to follow the my plate principal and to get at least three colors onto their plate. Each round was judged separately with both teams not learning the winners of either meal until after the lunch/dinner course was served. The judges were Abbey Wolfe (the Wellness Center), Min Krishnamurthy (Giant Foods DMV Dietitian), and Dr. Trina Ulrich (Department of Health Studies).

RESULTS

DEMOGRAPHICS

The class was originally capped at 12 students. However, after students dropping and not showing up to the first two classes, the class had nine students. Three weeks after the course ended, the students were sent a Google Forms survey to evaluate the class. One student was lost to lack of follow-up response (not filling out the post-course survey), therefore the n will be out of eight student participant responses instead of nine. This participant will be known as Participant J. The questions for this survey can be found in the appendix. The student demographics were 25% male, 75% female. There were four freshmen, three juniors, and one senior taking the class. One of the freshman girls was British, and came to America to start her higher education. A junior female was also Russian and moved to the United States with her husband to continue her education. Five of the students had school meal plans, which correlates to the amount of students that lived on campus. Student meal plans are required for all students living on campus. The one junior with a meal plan had the 100 block. The freshman students had the 175 block, the minimum requirement for first-year students. Figure 1 shows that when asked about their usage of their meal plan - this year (and previous years from the upperclassmen)- 50% of participants used their meal plan at least once a day, 25% claimed to only rarely use their meal plan, and 25% said they did not use their meal plan. Figure 2 reveals that 75% of the participants also stated that if they could chose to have a meal plan or not, they would not.

Do you/ did use your meal plan?
8 responses

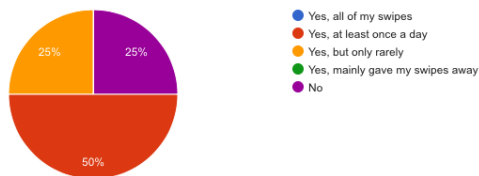


Figure 1: Participants' Use of Meal Plans

If you could chose to have a meal plan would you?
8 responses

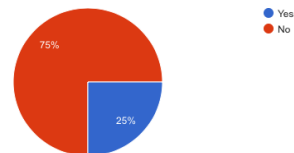


Figure 2: Participants' Choice of having a Meal Plan

PARTICIPANT REVIEW OF THE CLASS

Participants were asked a series of questions about their views on the class. In an open-ended question, participants left their feeling on the question: "Did you enjoy the class?" Six participants said yes. The other two said that they liked some days and some parts more than others. Figure 3 shows which week the participants liked best. These results mimic the participants responses of wishing they were able to have more freedom in the cooking environment instead of just following a recipe.

Which week did you like the best?

8 responses

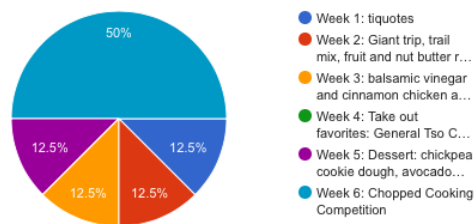


Figure 3: Participants' Favorite Week

Besides the physical cooking aspects of the class. The students were brought on tours of Giant and TDR. The overall response from the Giant tour was overwhelmingly positive. One student said, "I thought it was fun and learned a lot! It's cool there's a student discount I didn't know!" Another shared her knowledge retained from the tour on February 7, 2018, "Got to know the grocery store close to where I live. Informative and helpful regarding nutrition facts, specifically with similar products with different ingredients." The response on the TDR tour was not as exciting. The students repeated each other saying that the tour was redundant, they did not learn anything, and that the speech felt rehearsed and felt as though the registered dietitian was pitching them. Of the students that attended the final week, they all raved about their ability to cook what they wanted to and utilize their skills. A few of the student responses about the cooking competition include: "I loved it!! It was by far the most enjoyable aspect of the entire class!," "It was fun. I preferred it to the other classes because we could just cook what we wanted instead of being told what to cook and having to follow a recipe," and "My favorite class, able to utilize skills and tips we'd learned over the weeks. Also fun to be able to serve other people the food we made!"

Even with the positive feedback from the participants, 75% of them missed at least one week of class. Figure 4 shows the variation of the attendance throughout the weeks. It is important to remember that this pilot program was offered with no university credit incentive for the students. Three students reported 10-26 hours before a class that they would not be able to attend the class due to having too much work due the next day. Other students did not show up to class and waited days to say why they missed class. Two students did not even bother showing up or responding to my messages for the last two classes.

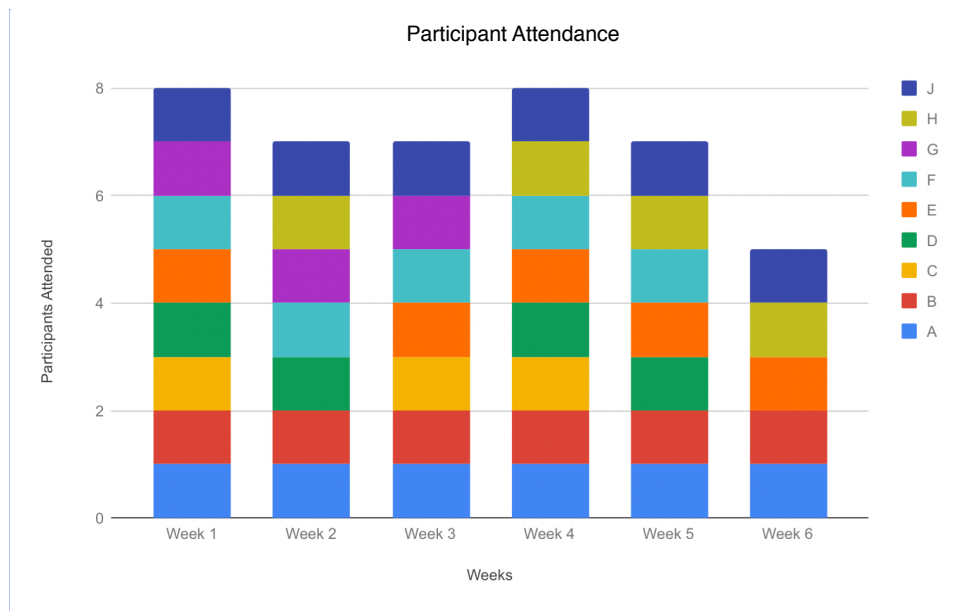


Figure 4: Participant Attendance

The bar graphs of each week are broken into colored sections to show which participants came which weeks. The total amount of participants for that week is also shown through the y-axis. For example Participant H was the only person that did not attend week 1 of the cooking class.

All of the participants came from vastly different backgrounds, but had similar reasons for taking the class. These reasons included: to learn how to cook, to learn recipes, to learn about cooking on a budget, to learn healthy eating habits in college, and how to use the kitchen. Three respondents have not utilized any skills, recipes, or knowledge they have gained in the class. The big takeaways and utilized material from the other respondents include: how to make recipes on their own, MyPlate, and the general tso's chicken and black bean taquitos. Two students found the class very beneficial in their overall eating habits:

“Learning some basic healthy alternatives for everyday ingredients was super helpful! Plus the technical aspects, such as learning to chop certain ingredients ie. onions, was super beneficial.” - Participant B

“Yes, I try to be more health conscious about what I cook with and how I balance a diet, like the nutritionist explained at Giant.” - Participant H

PARTICIPANT RECOMMENDATIONS

The participants were asked to answer questions about how they would want to see the pilot cooking class set up as a full flesh course. Figure 5 shows the participants views on college teaching life skills. Seven out of the eight responders believe that colleges should offer life skill classes for their students as an option to take.

Do you believe college should teach you life skills?
8 responses

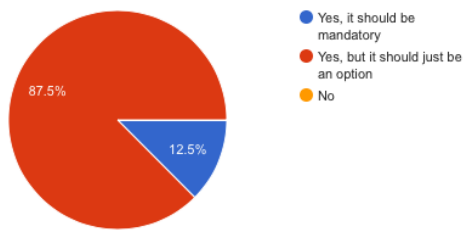


Figure 5: College and Life Skills

Would you take this class for credit?
8 responses

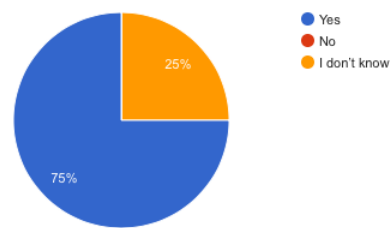


Figure 6: Cooking Class for Credit

Figure 6 shows that 75% of class participants would take a cooking class for credit. In a select all that apply question, the participants suggested how many credits they thought the class should be. The votes showed five for 1-credit, three for 2-credits, and three for 3-credits. The participants believe that the length of the pilot program (six weeks) was the correct time for the pilot program, but the amount of weeks should be increased if it was offered for credit. One student did not like the length of the class, stating, “No I got bored really quickly. I was more interested in the theory of healthy eating then the actual cooking because I know how to cook already. I feel like the theory could have been covered in depth and well in just two classes.” Lastly, the participants were asked to share anything they would like to add about what they learned, how the class was set up, and feelings on whether a cooking class should be offered for credit or not to students.

“It was a great way to learn about nutrition and cooking in a college setting.” -Participant A, freshman

“Thank you for your tremendous effort for putting this all together! I really enjoyed the class and being able to not just learn about cooking, but also meeting new people. I think that this is most definitely a class that should be offered for credit, and if it were, I would take it! Thank you once again for your time, it was a wonderful class!” -Participant B, junior

“I didn't go on the tours because I wasn't aware of it before hand and may not have signed up for the class if I had known.” -Participant C, junior

“Maybe a shorter class in terms of time per class?” -Participant D, freshman

“I think it would be an interesting class but it should be taught by a proper nutritionist and should focus more on nutrition and how to eat healthily rather than how to cook basic foods which most people can already cook. I also thought the recipes were frustrating because I didn't necessarily like what we were cooking and wouldn't cook it again. I think with the internet, and being able to access tutorials and recopies, teaching students to follow a recipe is a waste of time. The class

should focus on learning how to come up with healthy meals, eat a balanced diet and learn about new flavors and cooking without recopies. ” -Participant E, freshman

“I think this class should be offered based on how it was advertised. I signed up for it because it was labeled about eating healthy and affordably in college. The Giant trip was the most solid aspect of the class when it came to discussing nutrition. The class itself did not discuss it past an elementary school understanding of MyPlate. Additionally, we were not told how much the food we were cooking cost or really any tips at all on affordable cooking. Nutrition and affordable eating are important in college and could have been more heavily emphasized in this class.” - Participant F, freshman

“I would like to learn kind of more interesting and harder recipes.” -Participant G, junior

“It was an enjoyable class led by someone who clearly enjoys sharing their knowledge and passion for healthy culinary skills. It seemed well organized and thought out, despite lack of attendance. The only thing I would really add would just to have more hands on cooking like the last class where the students cook the meal without being able to lean heavily on the teacher. Thanks for a great class!” -Participant H, senior

DISCUSSION

As the facilitator of the cooking class, the class went extremely well, but there were lots of bumps in the road. The utilization of Kay Spiritual Life Center’s basement kitchen space was a great size for the small cooking class. Sadly, only two of the four stove tops worked and the configuration of the kitchen did not lend to many people working in the location at once. After the first week, the recipes were adapted so that there would only ever be one burner that would need to be in use at a time.

The ingredients for recipes were ordered from Giant Foods’ Peapod grocery delivery service. Utilizing Peapod allowed for the ingredients to be delivered directly to the university for storage in the Kay basement refrigerator and pantry Wednesday mornings until class started that afternoon. However, four out of the five times that we utilized the service, the delivery was at least an hour late. There is also a \$60 minimum for each order and a \$10 delivery charge on top of that, for each order. There were a few circumstances when extra items were bought out of need to reach the \$60 minimum and not because it was a necessary ingredient.

For week three, I received a donation from AU Dining to supply the food for the week. There was an in person meeting with the head of AU Dining and the school dietitian (point of contact) to discuss a partnership. It was decided that they would be able to provide in-kind food donations. However, even though AU Dining was given ample time to gather the ingredients necessary for the cooking class for week three. There was an internal miscommunication within AU Dining’s management that the TDR management team did not know of the arrangement

until I arrived at TDR to pick up the ingredients. I wanted over an hour for the TDR team to gather the ingredients, of which was not a complete compilation of the list that was given to management team. The in-kind donation of ingredients was stopped after this week. However, the relationship was maintained with AU Dining's parent office, the One Card Office, to supply cooking appliances, utensils and tools, and the TDR tour in week five.

Overall, attendance at the cooking classes averaged around seven participants per class. For the small amount of cooking space that we had, it worked out well having such a small group. However, it was extremely difficult to keep students motivated to attend and participate in class. The participants understood the time commitment prior to registering for the class, yet were upset when we went the full time or had other work to get done that day for classes that affected their GPA's. Not having the participants of the class accountable for anything allowed them to not think twice about missing class. If a form of this class was to be entered into the AU Course Catalogue, a credit needs to be associated with the class where the grade is heavily supported by the participants' attendance.

I agree with the participants that this course needs to be co-taught by a registered dietitian and a chef. My nutrition knowledge is limited and I did not have the answers to every question. Having a registered dietitian lead the class will also insure that there is a large enough knowledge gap between the instructor and the students. The participants respected me for the most part, but since I had to utilize Facebook as my main mode of communication with the students instead of through blackboard or email, the initial level of respect was lowered. This also allowed the participants to have less guilt for missing class or doing homework for other classes while the cooking class was going on.

The recipes for each class were not chosen until the week prior to allow for more planning and budget managing. I found that the participants were always intrigued in what we would be making the upcoming class but would let their feelings on the chosen food be known after it was announced. For instance, week one utilized a vegetarian meal with black beans as the source of protein. The participants were upset to not be preparing meat had a negative connotation in their voice when asking if this class would only be creating vegetarian meals. Another student would not even taste the edible cookie dough made in week five because she did not like peanut butter. It is important to note that all food allergies and intolerances were acquired before the class started to ensure that students would be able to consume the food and to avoid any allergic reactions. The only intolerance was to dairy and lactose-free products were utilized when dairy was required in a meal.

A decrease in interest could be seen throughout each class period as time went on, and throughout the weeks. If this pilot program was turned into a credited class, out of class homework would need to be included. This would enhance student accountability to the learning process and program.

Overall, the cooking class went extremely well. The main takeaways are that students need to be held accountable for their attendance and in-class arousal levels, proper teaching space is required, and pre-class arrangements and preparations need to be secured so organizational mishaps can be minimized.

PROPOSAL

WHAT OTHER UNIVERSITIES ARE DOING

There are multiple schools around the country that are working to combat the obesity epidemic. Below are seven examples of what universities are doing across the nation.

BOSTON UNIVERSITY - SARGENT COLLEGE OF HEALTH & REHABILITATION SERVICES

BU's Sargent College hosts the Sargent Choice Nutrition Center. The Nutrition Center is staffed by four Registered Dietitians (RD). Services provided include nutrition counseling, weight-loss essentials, sports nutrition consultations, eating disorder counseling and aid, and nutrition workshops. Students have access to five free one hour nutrition counseling session each school year with any of the center's RD. The nutrition workshops cover a variety of topics including meal planning, thoughtful eating, budget friendly meals, and stocking a healthy kitchen. These workshops are free for students to attend. Sargent College also collaborates with the Boston University Dining Services to develop BU's Healthy Dining Program. The program offers nutrition students to work with the dining services to create healthy recipes that are held to a certain standard. These meals have to be nutritionally dense while also being delicious. The entrees created by the nutrition students and others created by the dining services' chefs are labeled with a Sargent College stamp in the dining halls and convent stores across the campus for students to purchase and consume. These recipes have become so popular on BU's campus, that once a week is Sargent College night in the main dining hall; every food option offered has the Sargent College stamp of approval. The stamp gives students a quick indicator that the food is filled with nutrients and those nutritionist are proportional to the food item's calorie count, making it a smart food choice option. On the Healthy Dining Program's website, students can find videos, recipes, and blog posts from the university chefs and RDs explaining healthy eating, creating recipes, and step by step recipe instructions (Boston University Sargent Choice Nutrition Center, 2018).

UNIVERSITY OF GEORGIA - HEALTH CENTER

The University of Georgia's Health Center offers for-cost cooking classes to students and student groups on campus. In the university's Nutrition Kitchen cooking class of six-twelve students students learn about creating elegant meals to serve to friends, how to create vegetarian, vegan, and meat meals, how to meal prep, and more. Each class has a specific topic and the good that will be cooked in these classes are listed on the Health Center's website. Each class is either \$5 or \$10 depending on if the student paid the university health fee. Groups are able to book the Nutrition Kitchen for privet cooking classes for a set group rate (The University of Georgia, 2018).

UNIVERSITY OF CENTRAL FLORIDA - FRESH U PROGRAM

The University of Central Florida's Fresh U program consist of a community garden where students are able to plant, tend to, and harvest fresh produce. The harvests from the garden are also utilized in cooking demos and classes put on by the program. Fresh U is possible because of its partnerships with the UCF Arboretum, Student Union, Student Health, Services, and the Knights helping Knights Pantry (University of Central Florida, 2018).

UNIVERSITY OF CALIFORNIA: DAVIS - STUDENT HEALTH & COUNSELING SERVICES

UC Davis has a large teaching kitchen where the Student Health and Concealing Center puts on free cooking classes every other Friday for university students. Each class is limited to twenty-two students. UC Davis also has a free fresh produce program. In partnership with the on campus community garden and local farms and marketplaces, fresh produce pick-up stations are able to be held around campus twice a week. The Student Health and Concealing Center also created a, "One Balanced Meal" section to their website where they hold a collection of all the recipes created in their cooking classes over the years and more (University of California: Davis Campus, 2018).

UNIVERSITY OF ARIZONA - COOKING ON CAMPUS PROGRAM

The Cooking on Campus program is created in partnership with Arizona's campus recreation office, campus health center, culinary services, and the student health advisory committee. The program is advised by one of the university's registered dietitians and organized by a group of volunteer students (which a majority are nutrition and dietetics students). The program has a university chef that teaches the classes. Each class has a different theme and is publicized with what will be cooked in each of them. The program offered cooking class, but also "Dorm Room Eats" free cooking demos, and a blog filled with recipes. Each class is limited to eighteen students (Campus Health Services, 2018).

UNIVERSITY OF COLORADO: BOULDER - CAMPUS DINING SERVICES

UC Boulder's campus dining services set up one of the on campus dining halls to have high top counter tables that are utilized as normal tables during eating hours next to a publicly viewed teaching and demo kitchen. When meals are not served, these tables are used as the desks and basic prep stations for cooking classes. The tables have outlets in them so students are able to utilize electric utensils. Each cooking class is focused on a different dish and cooking skills. Each class is limited to eighteen students (Weaver, 2017).

TULANE UNIVERSITY - THE GOLDRING CENTER FOR CULINARY MEDICINE

Tulane's Goldring Center for Culinary Medicine was the first dedicated teaching kitchen implemented in a medical school. Each medical student at Tulane is required to complete a minimum of four consecutive weeks (Monday-Friday 9am-5pm) in the testing kitchen during medical school. By the end of the four weeks, each student will have competed the recommended twenty-five hours if nutrition education. The program is to allow tomorrow's

doctors edge away from proscribing pills and proscribing natural sources on nutrients. Doctors are able to prescribe specific foods for the nutrients that each patient needs more of (Shaw, 2014).

WHAT AMERICAN UNIVERSITY IS CURRENTLY DOING

American University has taken steps towards helping its student population understand food, its nutritional value, and have access to food products.

CLASSES

AU offers two nutrition and cooking based classes to university students: Introduction to Nutrition (HLTH 205) and Chemistry of Cooking (CHEM 150).

Introduction to Nutrition gives students a blanket look into the nutrients in food, food labeling and product claims, digestion, and personal nutritional eating habits. In this class, students gain a greater understanding of the nutritional world. Students focus the beginning of the semester on nutritional guidelines (from the food pyramid of the late 1990s/early 2000s, to the My Pyramid of the mid-2000s, and the current MyPlate guidelines. The class spends one week on the digestion process digestion, a week on each macro nutrient, a week on all the vitamins, and a week on all of the minerals. Students also look at lifestyle nutrition, and debate current “hot topics” in the public’s eye of nutrition. These “hot topics” range from the consumption of vitamin supplements, the cost of eating healthy vs. no healthy food, bottled water vs. tap water, and the consumption of organic produce (School of Education, Teaching & Health, 2015, pp. 1-8).

One student said that taking Introduction to Nutrition opened their eyes to the nutrition world, but the information learned did not stick after taking the final exam. They said that the class was interesting, and was perfect for learning just the basics to take the test. The student said that after the class, their main take aways were an increase in water consumption and the consumption of five fruits and vegetables a day (A. Thompson, personal communication, April 30, 2018).

This class is a great start for students to gain more information about the nutrition field and what they are putting into their bodies, however there are a maximum of 150 spots in this class per semester and is mainly filled with junior and senior students. This class is only reaching 1.89% of university students each semester. (This percentage is based off of American University’s undergraduate enrollment of 7,901 students in the 2017-2018 academic school year as reported by the *US News and World Report*.)

Chemistry of Cooking is offered as a general education lab science course at American University. The class goes over the chemical reactions within food (Chemistry Department, 2016, pp. 1-10). However, the students do not learn about the nutritional value of the foods. Suzy Claeys, a senior at American University shared her experience in the course, “The labs met once

a week and we made a food item based in the weeks lesson. So if we learned about the affect of baking powder and the chemical reaction that takes place during he baking process we would make cookies. We made a batch with baking powder and one without and then compared them. It was a fun class but I cook a lot of my own food so I knew a lot about what we were doing minus the science chemical reactions. We only made about ten different foods, and focused of the scientific chemical reactions in the food, not their nutritional content.” (S. Claeys, personal communication, April 28, 2018).

ON CAMPUS PROGRAMS

American University offers a program called “AhealthyU,” for its faculty and staff. AhealthyU offers health and wellness activities for the faculty and staff to participate in. These events include cooking demos, fitness challenges, and setting SMART goals to reaching their personal wellness goals. The program utilizes positive reinforcement to enhance participation. Each semester participants can fill out a game sheet to collect stamps for completing specific fitness and nutritional activities. Once participants collect a certain amount of stamps, they are able to trade them in for prizes (American University, Points to AhealthyU Game, 2018).

Every Wednesday, Agora Farms and Giradot’s Crumbs set up a farmers market on AU’s quad. This gives students the options to purchase fresh fruits, vegetables, and hearth baked breads. American University is also apart of the From the Farmer program where people are able to purchase fresh produce (5-10 seasonal items) from local farms. The program delivers the boxes of food to campus each Tuesday. American University faculty and staff receive \$5 off any subscription delivery. The From the Farmer program is mainly marketed to the faculty and staff through AhealthyU (American University, Farm Fresh, 2018).

The Market: AU’s Food Pantry was created in 2017 to combat food insecurity. The Market partners with the Capital Area Food Bank, AU’s Center for Community Engagement and Service, and the College and University Food Bank Alliance to supply the food bank. The Market is open for eighteen hours a day, but is locked at all times. To receive access, students must fill out an access request form to enter the Market (American University, The Market: AU’s Food Pantry, 2018).

THE FARM

In 2016 American University received a gift from the Airline Foundation of 300 acres in Warrenton, Virginia. AU’s goal of the gift is to incorporate its academic and sustainability initiatives into the development and usage of the acres. To continue Airline’s values, by utilizing the acres to enhance the environment. Of the 300 acres, 20 of them have been developed into farmland. The farm produces over 45,000 pounds of produce each season.

American University’s sustainable farming practices (underground irrigation systems, and solar and geothermal power), enhance AU’s organic farming practices. The university also works to have the spaced used in the classroom. During the spring 2018 semester, five classes integrated agricultural and sustainable practices into their curriculum. These classes utilized the farm as a

case study and the students were able to gain hands-on learning experience from visiting the farm. American University's goal is to utilize this produce in a farm-to-table program to fully stock TDR with produce from the farm. This will aid American University in its sustainability efforts and maintain its carbon neutrality stance (American University, AU at Airline, 2018).

MY RECOMMENDATIONS

American University is far from helping its students fight the fight against obesity. After reviewing the independent study pilot six-week cooking class, what other universities are doing, and what AU is currently doing, I have created a three fold recommendation.

The first fold is to gain the staff that is necessary to create an inclusive and effective environment. Increasing the Wellness Center's budget will allow them to hire a Registered Dietitian who is able to head healthy eating and weight management programs across campus. It is important that this RD is separate from the AU Dining RD that works for Aramark, because the Aramark team is limited to what they are able to do. Having a separate RD, student will be able to gain more attention and effective programming. The two RDs would create a positive working relationship. The new wellness center registered dietitian position would be in charge of creating the following programs.

The second fold is creating 2-3 hour day or weekend long seminar cooking classes. This will allow for these classes would start off on a \$5 fee basis. With the possibility of becoming one-credit weekend seminars. These seminars will each have a specific theme. These themes could include vegetarian and vegan meals that are not pasta based, oven roasting, meal prep, healthy snacks, and more. Each session will also focus on each recipe being budget friendly.

The last fold of the program is to create a 1-2 credit semester long cooking class. This will allow students to gain more skill and confidence in the kitchen, and opens up the syllabus for more individual creation by the students. This class would be under the Health and Fitness (HFIT) domaine. It is proposed that the class would be full based of the high volume and enrollment in the 1 and 2 credit HFIT classes. The class can be set up like the current yoga classes and meet twice a week for 75 minutes, or like the salsa class and meet once a week for three hours (a block period). To increase participation adherence and arousal levels, out of class assignments would need to be assigned. These assignments could include weekly journal entries about what they learned that week or as a reflection on a specific food issue brought up by the class instructor or news article shared with the students. A larger project and final for the students would be to create a three course meal that follows along with a theme. Another project option would be to have students utilize the skills learned in the class to create or follow a recipe for a lunch they would actually eat and record their meal prep process.

For all of this to happen there needs to be the appropriate space. The university recently announced the construction for the new science hall. Right now the Hall of Science is to hold research lavatories, classrooms, lecture halls, collaboration spaces, and student lounges. It is still

early in the process of construction that a test/ teaching kitchen can be added to support the creation of the new cooking demos. If this location is not an option, there are others that can be modified over a summer vacation.

The produce grown on American University's farm in Virginia can also contribute to the cooking program. Participants can utilize fruits and vegetables grown there in their cooking, learn about organic farming and the difference between non-organic produce, and visit the farm. The collaboration between the Airline Farm and American University can go beyond the farm-to-table relationship adding a semester long cooking class to the list of cross-discipline courses that engage in hands-on learning through farm visits. This will also help keep the cost of the program down, by not having to continuously purchase fresh produce.

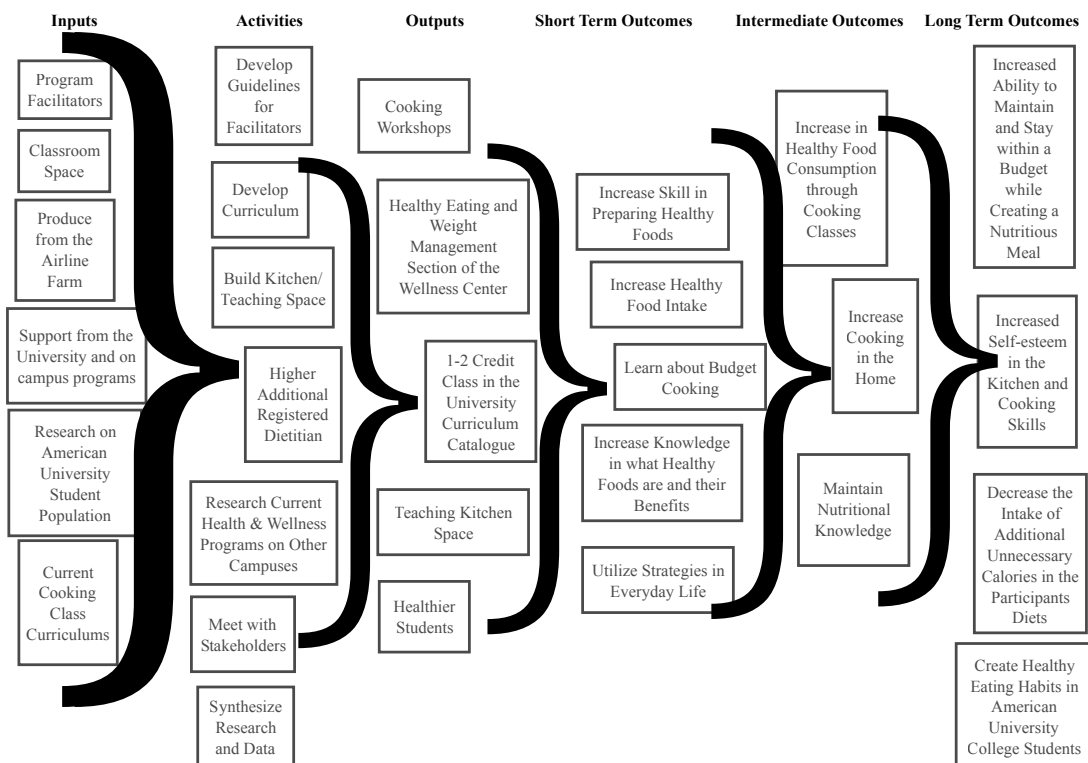


Figure 7: Logic Model of Recommendations

Figure 7 is a logic model of my recommendations to the university on the effectiveness that this program can have on the American University student population. The inputs are what is needed to allow the activities to happen. The activities are completed by the development of the program team in order to execute the outputs. The three fold program of my recommendations will create the short term, intermediate, and long term outcomes in the participants abilities and confidence in themselves. Overtime, the cooking classes with budget friendly and nutritionally dense recipes will aid AU students in cultivating healthy eating habits to decrease a risk factor in the development in obesity, and combat the overall obesity epidemic.

As American University is finishing up its process of developing the next 5-year plan for the university with it's first female president, it is important to ensure that todays students are creating healthy habits for a brighter tomorrow.

APPENDIX

INITIAL RESEARCH SURVEY QUESTIONS

1. What year are you?
 - Freshman
 - Sophomore
 - Junior
 - Senior
 - Other
2. Do you live on campus?
 - Yes
 - No
3. Where do you live on campus?
 - Letts/Anderson/Centennial
 - East Campus
 - Hughes/McDowell
 - Cassell
 - Nebraska
 - N/A
4. Do you currently have a school meal plan?
 - Yes
 - No
5. If so, which meal plan do you have?
 - 275
 - 250
 - 225
 - 200
 - 175
 - 125
 - 100
 - 50
6. Where did you learn to cook? (check all that apply)
 - Home
 - Social Media (Tasty videos, pinterest)
 - Self-Taught
 - Friend

Cooking Classes
I do not know how to cook
Other

7. Do you enjoy cooking?

Yes
No
Sometimes
I don't know
Other

8. Why do you cook? (check all that apply)

I enjoy it
It is relaxing
To create something
I don't cook
It's cheaper than buying food
Other

9. Why do you not cook?

Time
I don't know how
I don't know what to cook
I cook
Other

10. If you cook, how many meals are microwaveable?

None
1-3 a week
4-6 a week
7-10 a week
All meals
I don't have a microwave

11. How do you feel about your knowledge on nutrition?

I know a lot about nutrition
I know some information
I wish I knew more about nutrition
I know very little about nutrition
It doesn't matter that much to me

12. Do you like the on campus food option?
Yes
I like some places but not others
No
13. Do you feel the on campus food options are nutritious?
Yes
I think some are but not all of them have healthy options
No
14. On average how many times a week do you eat out/order take out?
Never
1-3
4-6
8-10
11+
15. What is your main reason for ordering take out?
Cost
Easy
Don't know how to cook
Don't want to cook
I like takeout food options
16. What is your main reason for buying food in the store?
Price
Nutrition
Easy
Availability
Other
17. When do you go grocery shopping?
Once a week
When I am out of food
For each meal
I don't food shop
I use a food delivery service like Peapod
18. Do you believe college should teach you life skills?
Yes, it should be mandatory
Yes, but it should just be an option
No

19. Have you ever taken a cooking class?

Yes

No

I don't know

20. If a cooking class was available to you, would you take the class?

Yes

No

It depends

21. If taking a food class what would you want to learn? (check all that apply)

How to cook chicken

How to cook meals from different cultures

How to cook meals for the week

How to cook programs I can change up a little bit

How to cook vegetarian

How to cook vegan

How to cook red meat

How to cook a meal in the microwave

How to use an oven

What pan to use

What spices to use

How to make a full meal

What foods should I be eating?

How much should I be eating?

How do I know what to eat?

Other

22. What is most important to you when choosing the food you eat?

Nutrients

Energy

Family

Taste

Cost

Accessibility

Social Context

Society Values

23. Please add any other information you want us to know about for our development of a college cooking class and its curriculum.

24. Would you be interested in taking a cooking class for 0 credits next semester?
Yes
No
25. If yes, provide your email to receive updates
26. Do you feel passionate about why/how your eating habits are healthy or unhealthy?
Yes
No
27. If yes, write about it below and add your first name

COOKING CLASS EVALUATION SURVEY QUESTIONS

1. What year are you?
Freshman
Sophomore
Junior
Senior
Other
2. Do you live on campus?
Yes
No
3. Where do you live on campus?
Letts/Anderson/Centennial
East Campus
Hughes/McDowell
Cassell
Nebraska
4. Do you currently have a school meal plan?
Yes
No
5. If so, which meal plan do you have?
275
250
225
200
175

125

100

50

6. Do you/ did use your meal plan?

Yes, all of my swipes

Yes, at least once a day

Yes, but only rarely

Yes, mainly gave my swipes away

No

7. If you could chose to have a meal plan would you?

Yes

No

8. If yes, what size you get

9. Did you enjoy the class?

10. Which week did you like the best?

Week 1: Vegetarian Taquitos

Week 2: Giant trip, trail mix, fruit and nut butter rolls

Week 3: balsamic vinegar and cinnamon chicken and pesto chicken and vegetables

Week 4: Take out favorites: General Tso Chicken, Sweet Potato Pizza

Week 5: Dessert: chickpea cookie dough, avocado brownies, nice cream & TDR tour

Week 6: Chopped Cooking Competition

11. Please share your feelings on the Giant tour.

12. Please share your feelings on the TDR tour.

13. Please share your feelings on the cooking competition.

14. Did you miss any classes?

Yes

No

15. If so which weeks and why did you miss?

16. If this was a class you were taking for credit, would you have skipped classes?

Yes

No

Other

17. What was your reason for taking this class?
18. Have you utilized any skills, recipient, or knowledge from this class in your life since you've learned it? Please explain
19. Do you believe college should teach you life skills?
 - Yes, it should be mandatory
 - Yes, but it should just be an option
 - No
20. Would you take this class for credit?
 - Yes
 - No
 - I don't know
21. If so, how many credits?
22. Did you like the length of the class? (6 weeks?)
23. Please add anything else you would like to add about the class, what you learned, how it was put on, etc., and anything you want to share in helping get a class like this offered to students for credit, or if you don't think it should be offered and what not.

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