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Cultivating seeds, nourishing minds: : a study of gardening instruction and the impact of student fruit and vegetable intake

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Introduction

Healthy food is what's up! Actually, it's what's down on the ground, in the soil. The late great Whitney Houston once sang "I believe the children are our future, teach them well and let them lead the way." I completely agree, and in order to teach them well, adults have a responsibility to feed them well. Unfortunately, this can seem difficult and even daunting in modern America. I remember at 10 years of age sitting in a Lyon's restaurant in Salinas with my mom. Concerned about the way I never ate vegetables, mom said to me, "If you eat all the lettuce on your plate, I will give you 10 dollars." Looking apprehensively at my plate, I considered her offer. She knew I didn't like to eat vegetables, but her tactic worked! I ate all the lettuce, and to my surprise it wasn't gross, it was tolerable. Increasing the preferences for vegetables and fruits makes a significant impact on our lives at all ages, yet the stage of childhood remains particularly crucial to the development of healthy eating habits. Looking back on that day, I feel immense gratitude that my mom confronted my stubborn palette because I love vegetables now, so much that I am actually a vegetarian.

During childhood, my sister and I helped my mom in a community garden at the church we attended in East Salinas, Salinas Vineyard. We grew squash, zucchini, tomatoes, carrots, corn, and all sorts of wonderful plants from nature's bounty. Through gardening my mother helped to instill the value of nature and healthy food in the consciousness of my sister Bethany and me. When children learn about the importance of fruits and vegetables through adults who lead by example, the world of healthy eating doesn't seem foreign, threatening, or yucky; it becomes natural, delicious, and invigorating to our bodies. Through this project, I wish to explore how this becomes possible for students, and examine ways gardening activities enable young people to learn more about maintaining a healthy lifestyle.

The Danger of Malnourishment

At the risk of using a stock phrase, obesity is a major problem in the United States, and the youth are particularly at risk. More than 23 million children and adolescents in our nation are either obese or overweight, which can increase the risk of serious future health problems. (Brown, 2010). Multiple studies have revealed that many youth in America eat too much added fat, added sugar, and highly processed food and dairy products. Unhealthy eating has been identified as the most prevalent chronic disease risk behavior among 12-17 year olds in the U.S. (Gosliner et al, 2011). Whether a child is severely underweight or overweight, the issue remains the same, that person is starving; that is, they lack the nutrients they need and their bodies are suffering. A crucial issue regarding obese children is that they are getting too much of what they don't need and they aren't getting enough of the things their bodies need to maintain good health. The alarming results from researchers beckon for our attention. We can address this issue by showing children the joy of eating foods that are of significant nutritional value, and increasing fruit and vegetable intake is a way to convey messages that reinforce healthy habits.

The Responsibility of Modern Education

Schools play a crucial role in nourishing the minds and bodies of our youth, and unfortunately, foods of low nutritional value are often typical fare in school. However, many people are aware of this and are seeking to correct the nutritional irresponsibility. An example is the Community Food Security Coalition, based in Portland, Oregon. The Coalition includes nearly 500 anti-hunger, environmental, community development, sustainable agriculture, community gardening, and social and economic justice organizations. (Brown, 2011). From 2009-2010, the coalition advocated for more federal support and

funding for farm-to-school initiatives to improve the quality and healthfulness of student meals through the inclusion of more fruits and vegetables provided by local farmers. Results of their efforts included the USDA broadening its definition of minimally processed foods to include those washed, chopped, or cut, which allows schools to use federal funds to procure local fruits and vegetables that meet their needs.

My Hypothesis and Involvement

For this project I connected with Anzar High School, where I earned a high school diploma in 2005. On the campus lies a beautiful garden. Principal Charlene McKowen instructs a class where students grow vegetables and fruits and make their own compost. Being there, I had the privilege of interacting with students and learning with them about what it takes to grow healthy and delicious vegetables and fruits. After my first day volunteering at the class, Mrs. McKowen sent me home with a bag of some yummy dinosaur kale, zucchini, and diced onions! Through my time at the school, I investigated eating habits of students enrolled in the gardening class, in order to determine how what they are learning in the garden translated into their dietary choices and preferences for fruits and vegetables. My hypothesis was that students involved in gardening activities would have a strong preference for fruits and vegetables due to their enrollment in the class. I wanted to know what they liked to eat, and I was curious to discover if the students were integrating produce into their meals as a result of exposure to the knowledge from their class of the health benefits fruits and vegetables offer them.

Literature Review

Confronting Concerns

Considering the aforementioned issue of obesity and other related diseases, the impact of this harm

is significant. Confronting obesity usually requires a reexamination of food preferences. Taste, convenience, cost and health concerns are all influences on what people of all ages like to eat. Getting young people to prefer healthy foods can seem challenging in today's world. Television advertising can contribute to the problem of obesity, too. The exposure to junk food ads can compromise the intake of more wholesome food such as fresh vegetables and fruit. (Somerset & Markwell, 2008). I can remember personally how happy meals sounded much yummier to my palate than fruits and veggies as a child! As I grew older and my metabolism slowed down, my health suffered by a lack of fruits and vegetables and excessive consumption of food lacking substantial nutritional value. My health improved through a deliberate effort to eat more fruits and vegetables, and has fueled my passion for this topic.

How Fruits and Vegetables Contribute to Wellness

Scientific evidence shows inadequate fruit and vegetable intake is associated with higher risk of a range of chronic diseases, including coronary heart disease, obesity and some forms of cancer. (Somerset & Markwell, 2008). Inadequate consumption of vegetables among adolescents in particular has been correlated with a range of poorer academic and health outcomes including lower academic performance, alcohol and drug use, being overweight, and weight dissatisfaction (Ozer, 2007, as cited in Neumark-Sztainer et al, 1996). A diet high in fruits and vegetables helps decrease the risk for many chronic diseases and some cancers, and can aid weight management. In the largest and longest study done as part of the Harvard-based Nurses' Health and Health Professionals follow-up Study, 110,000 men and women participated in research that recorded their eating habits over a period of 14 years. Data showed the higher the average daily intake of fruits and vegetables by the participants, the lower their chances were of developing cardiovascular disease. Although all fruits and vegetables likely contributed to their health, the experts said green leafy vegetables such as lettuce, spinach, Swiss chard,

and mustard greens; cruciferous vegetables such as broccoli, cauliflower, cabbage, Brussels sprouts, bok choi, and kale; and citrus fruits such as oranges, lemons, limes, and grapefruit (and their juices) were especially valuable. (Harvard School of Public Health, 2013). An ounce of prevention is worth a pound of cure; looking to the garden, we can discover that those precious ounces of prevention lie in the nourishment available beneath our feet in the soil.

Youth Perspectives

Some adults assume that left to their own impulses, children would eat candy, chips, soda and cake all day. An interesting study was conducted surveying over 5,000 7th and 9th grade students from 19 California schools in multiethnic, low income communities to determine what was available to students and as well as what they desired. Most students (69%) reported that fresh fruit were important to be able to buy at school, more than chips (21%), candy (28%), or soda (31%). Most students in this study reported that healthy foods, such as fresh fruits and vegetables, were important or very important to be able to buy at school-far more than reported unhealthy food items to be important. The results suggested that the practice of serving students less healthy snack foods, such as chips, candy, and soda, at school may be failing to provide what most students want to have available at school. (Gosliner, et al, 2011). Recent scientific data has shown fruit and vegetable consumption among U.S. high school students remains low. In 2010, median consumption was 1.2 times per day for both fruits and vegetables. In addition, about one in four high school students consumed fruit less than once daily, and one in three consumed vegetables less than once daily. These results indicated that the majority of students are not meeting the daily fruit and vegetable recommendations for adolescents participating in less than 30 minutes of daily physical activity. (American Medical Association, 2011).

How Much is Ideal?

How many servings of fruits and vegetables should people consume daily anyway? According to the Harvard School of Public Health, 5 to 13 servings of fruits and vegetables a day (2 ½ to 6 ½ cups per day), depending on one's calorie intake. For a person who needs 2,000 calories a day to maintain weight and good health, this translates into 9 servings, or 4 ½ cups per day (2 cups of fruit and 2 ½ cups of vegetables). For most fresh or cooked vegetables and fruits, 1 cup is just what you would put in a household measuring cup. (Harvard School of Public Health, 2013).

History of School Gardens

Gardens in American schools have long been a method of instruction, tracing back to the 1890s. John Dewey, respected for his innovative ideas in education reform, urged teachers to connect intellectual and practical elements in their curriculum, and the school gardens that flourished from the 1890s into the 20th century is a noteworthy example. (Kohlstedt, 2008). In 1902, Dick Crosby of the U.S. Department of Agriculture noted "Teachers who have had experience with school gardens are almost unanimous in testifying to the good influence of a well-kept garden." By 1910, the School Garden Association of America, along with civic and women's clubs, horticulture groups, and educational organizations were all supporting and promoting the school garden movement. In 1914, the federal government created the office of school gardening within the US Bureau of Education. The first World War gave a boost to the school garden movement, and the motto "A garden for every child, every child in a garden" was adopted by the United States School Garden Army, consisting of kids ages 9-15. (Carter, 2009). The school gardens were initially used to teach children about the natural sciences, but they also provided agricultural training, promoted an appreciation of the beauty and bounty of nature, and helped instill a sense of civic cooperation and pride. In the 1970s, there was a noticeable reawakening, a growth in the popularity of school and youth gardens. Our great golden state of

California took strong initiative in 1995 with the "Garden in Every School" program. (Cabib, 2011).

Modern Agents of Change and Inspiration

Thankfully there is a growing movement in the United States for "greening" schoolyards through garden based learning! This conscious step helps instill the importance of eating fruits and vegetables in the awareness of the students. Probably the most prominent innovator of modern school gardening in America is Alice Waters. She is truly a maverick of our time. Throughout the 1980s and 1990s, school gardens were in a rarity to behold. In the early 1990s, she spearheaded the Edible Schoolyard at Martin Luther King Jr. Middle School in Berkeley, Ca, transforming an old blacktop yard into a thriving garden where students cultivate and harvest their own produce. Alice Waters promoted the project as a hopeful model for health and education policy change, saying "If schools across the country are growing and eating their own local, organic food, our domestic culture would change as well, as people again grow up learning how to cook affordable, wholesome, and delicious food." (Kuhner, 2012, as cited in Waters, 2005). Her presence has inspired others to take action with school gardens of their own, including Charlene McKowen, the principal of the school who helped start the garden at my action project site back in 2005.

From First Lady Michelle Obama's world famous Kitchen Garden, to Alice Waters' groundbreaking Edible Schoolyard in Berkeley, California, to a nationally recognized elementary school learning garden in the small Midwestern town of Ashland, Missouri, school children are planting and cooking up everything from arugula to zucchini. The last 20 years have seen great progress as schoolyard kitchens have been sprouting up around the country, teaching children better eating habits by helping them understand where food comes from. School gardens have struck a chord with

food-conscious Americans concerned about the spiking growth rate in obesity and juvenile diabetes-highlighted by First Lady Michelle Obama's Let's Move initiative announced in March 2010. On June 4, 2010, following the second season of her nationally inspiring White House Kitchen Garden partnership with D.C. school garden, Michelle Obama invited more than 500 chefs to join her Let's Move initiative against childhood obesity (Salter, 2010). Opportunities to share ideas and learn recipes can inspire cafeteria chefs to include more fruits and vegetables in their own cafeterias, so that there is more healthy food available to children in school.

Opposition

Though not a popular sentiment, it should be noted that some people believe school gardens are a waste of time. In the 2010 Atlantic magazine article, author Caitlin Flanagan declared school gardening "a vacuous if well-meaning ideology responsible for robbing an increasing number of American school children of hours they might otherwise have spent reading important books or learning higher math." She suggested that the use of time limits the opportunities for future success, "The solution lies in an education that will propel students into a higher economic class, where they (students) will live better and eat better." (Flanagan, 2010). Caitlin Flanagans' viewpoint indirectly implied that growing food was only for the socioeconomically disadvantaged in society, insinuating that once someone has a well-paying job they have no need to grow fruits and vegetables. Flanagan's argument also failed to acknowledge the myriad of ways students learn when teachers creatively integrate a variety of academic subjects into school gardening.

What Teachers are Doing

Teachers indeed use gardens for lessons in a variety of subjects like science, math, nutrition, environmental studies, and health. Edible gardens give students opportunities to become familiar with and eat produce they have grown themselves, which anecdotally increases the appeal of eating vegetables. (Ozer, 2007). Gardens and vegetables become tools that affect beliefs and behaviors about food as they facilitate activity and social interaction while growing, sharing, preparing, and eating vegetables. Positive interaction with and about vegetables builds positive associations with eating them and influences young people's food preferences. Gardens are a place where growing, preparing, and eating vegetables can influences ideas, actions, and the values young people internalize through the processes. Giving recipes to students lets them take their knowledge and share it with their families. (Libman, 2007). Chef Ann Cooper, who has received her honorary doctorate from Suny Cobleskill University for her work on sustainable agriculture and is a published author of books such as *School Lessons: Changing the Way We Feed Our Children*, says "Giving children a variety of fresh vegetables, fruits, grains, and proteins is a great way to augment their diets, help them try unfamiliar foods, and encourage healthy choices. Repeated exposure encourages children to try new foods; if they see jicama on the salad bar every week for 6 weeks, eventually they will get curious. One day they'll put a few pieces on their salad, and whether or not they like it, they've taken a risk and expanded their awareness." (Cooper, 2013).

Thinking Beyond Personal Health

Students involved in schoolyard garden programs also can learn about the connection between their everyday choices and the health of the community, the environment, and themselves. Understanding the

connectedness of personal well being and ecological health is very crucial today more than ever before, taking into consideration the value of responsibility and care for the earth's precious finite resources. The more frequently we consume foods that have been locally grown/prepared, the less resources are required to transport the food from the field to the dinner table. Students who participate in schoolyard garden programs learn about the connection between their everyday choices and the health of the community, the environment, and themselves. These lessons nurture sound nutritional practice, responsible food choices, environmental stewardship, and care for human communities.

Methodology

Purpose

The purpose of the survey was to investigate the ways involvement in the garden class impacted student knowledge and preferences for fruits and vegetables. The researcher carefully crafted questions, and reviewed them with a professor before administering the survey. Through the questions, the researcher wanted to discover if students were eating fruits and vegetables often each day because of their regular exposure to fruits and vegetables in the garden; in other words, to determine whether or not the knowledge gained through the class was translating into a habitual consumption of fruits and vegetables.

Overview

This research project required visits to a high school with garden activities. The researcher reached out to the principal based on previous acquaintance, and received permission to shadow gardening activities. Permission was granted to survey the students through email and telephone correspondence. Visits were conducted on Fridays at a small public high school in San Benito County, comprised of 422

students. Through the time spent with the students, the researcher was able to work alongside them in the garden activities such as composting, removing invasive plants, and harvesting such wonderful crops as green beans, eggplant, kale, tomatoes, etc.

Demographic Information

The site was appropriately located in a rural community renown for its agricultural contribution, and is also the place the researcher graduated high school. The population of the particular town on the central coast is approximately 1900 people. Demographics of the town are 51.6% Caucasian,37.6% Hispanic, 4.4% African American, 3.9% Asian, 1.6% Biracial, 0.7% American Indian, and 0.2% other.(2012, *San Juan Bautista, Ca*). The students' ethnicities of the school were primarily Hispanic (52%), Biracial (40%), European American (6%), Asian (1%), and other (1%). (*Anzar High School*, 2013)

Participants

Class participants were primarily European American (71%), 14(%) identified as Biracial, and (14%) preferred not to disclose their ethnicity. A survey was developed for the students and was composed of 20 questions, written by the researcher.

Procedure

All seven students in the class were surveyed. (See Surveys Appendix A). The participants took the survey on November 1, 2013 in their school kitchen. The researcher administered the consent form and survey together as one paper document. Consent was given by each participant upon receiving the consent form document attached to the survey. (See Consent Form Appendix B). The researcher

closely examined each completed survey and tallied all the quantifiable questions, as well as noting qualitative responses. Each response was marked and recorded on a sheet of paper, serving as a comprehensive examination of the data results.

Limitations

A limitation of the survey sample was the small class size, because of the small population of the community. Furthermore, the data was reported by students, not recorded by continuous scientific observation of participants.

Analysis

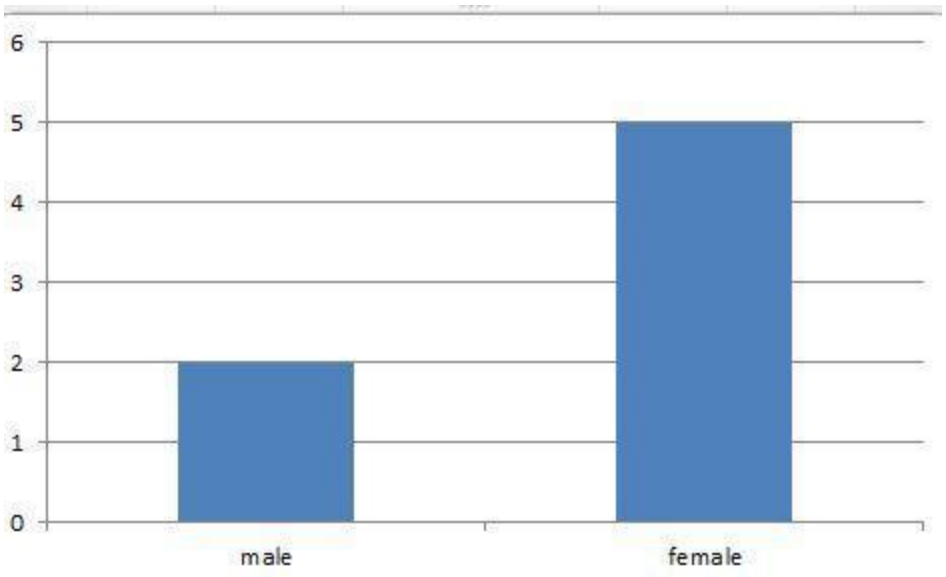
Everyone in the class was surveyed, and no one refused to participate in the survey. Being an elective class, gardening is not required for all students; thus, the interest lies solely in the individual regardless of race. There seemed to be an underrepresentation of Hispanic students in consideration with the school demographic. The overall school student demographic was over half Hispanic, though no one in the garden class identified as exclusively Hispanic. European American students comprise a small minority of the school population, yet the majority of the students in the garden class are European American (71%), and only one student identified as Biracial (14%), indicating European American and Hispanic heritage. Since the gardening class is predominantly Caucasian at a school where over half of the student body is Hispanic, attention is clearly required to address the underrepresentation of Hispanic youth.

Results

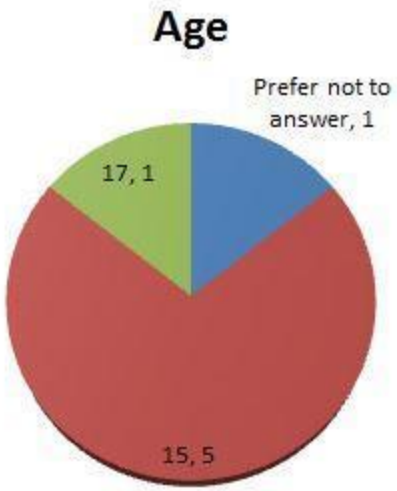
The survey results were tallied by the researcher. Since there were 20 questions in the survey, The

results will be addressed in order.

Question One: **How old are you?** There were 5 females and two males that completed the survey.

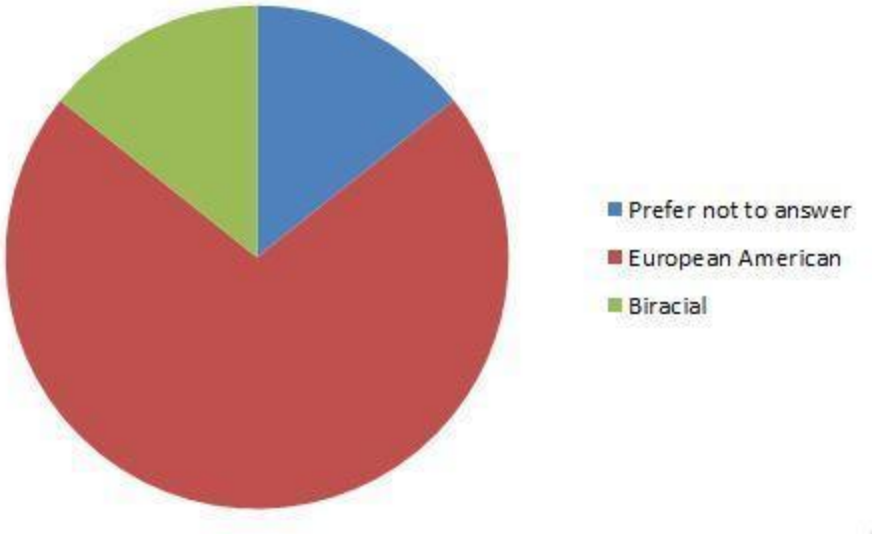


Question Two: How old are you? 1 student preferred not to answer 1 was 15 years old, and 5 students were 17 years old.

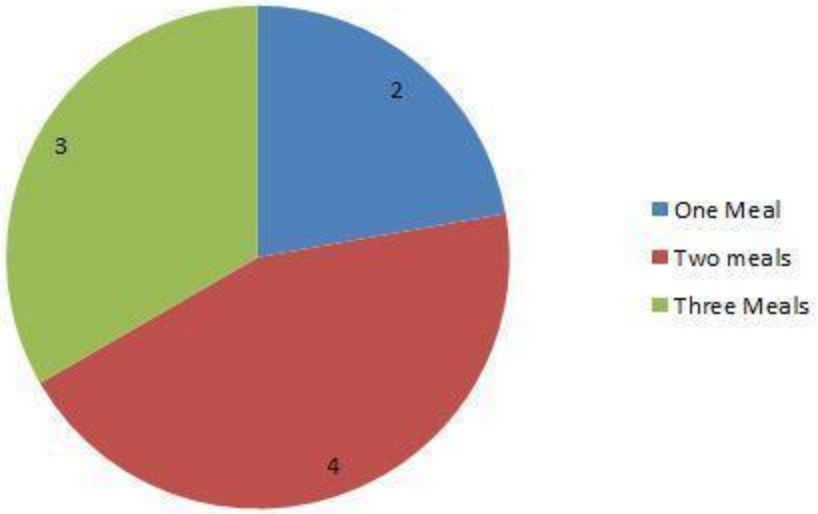


Question Three: What race/ethnicity do you identify with? One student preferred not to answer, 5

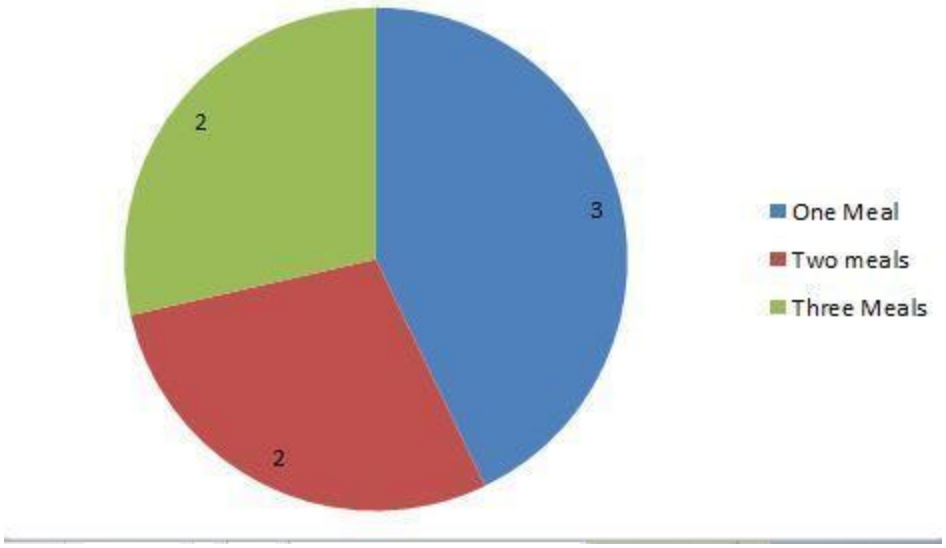
were European American, and 1 was Biracial (Indicating European and Hispanic origin).



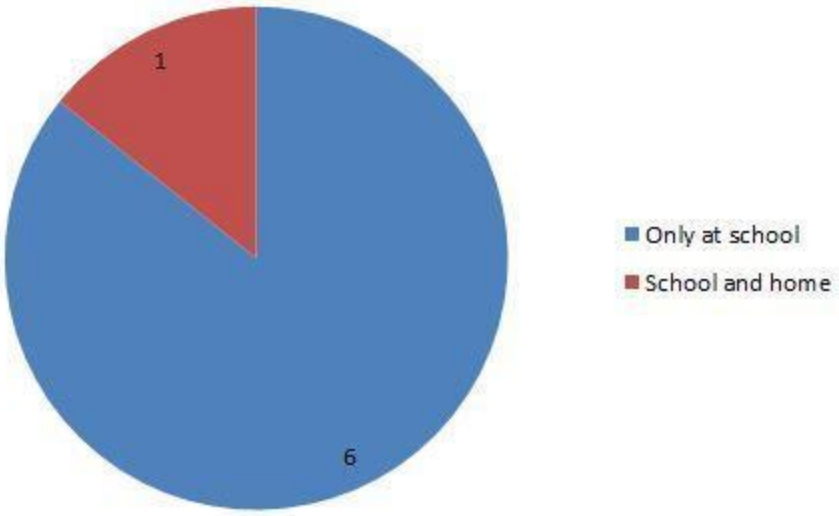
Question Four: In a typical day, how many of your meals/snacks include vegetables? Five of the students reported eating vegetables in at least two meals each day.



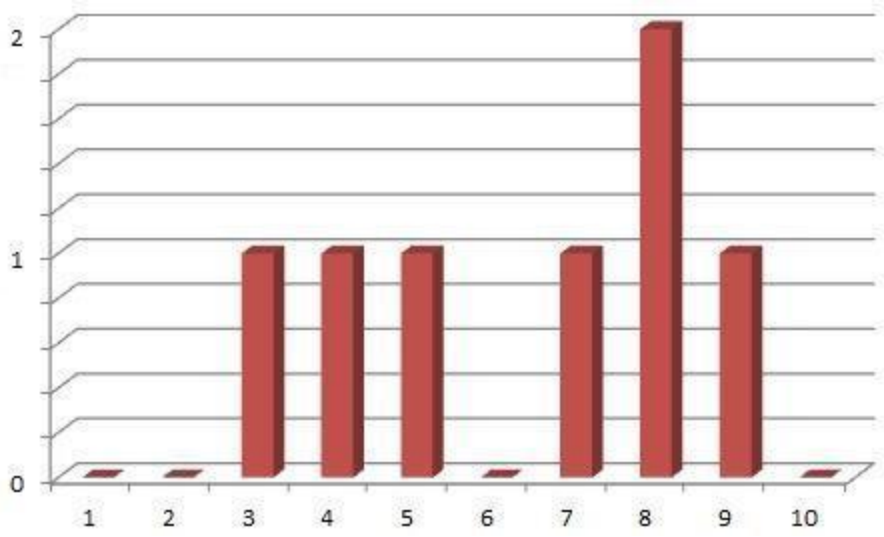
Question Five: In a typical day, how many of your meals/snacks include fruits? Over half ate fruits twice, and two even ate fruit three times a day.



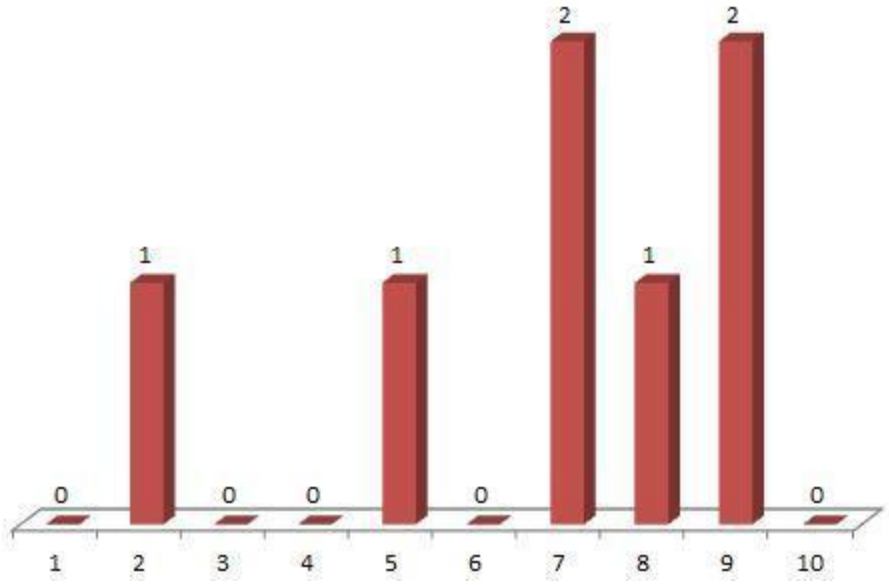
Question Six: Are you involved in gardening outside of school? To which 6 students said they were involved in gardening only at school, with one indicating they were involved at home occasionally.



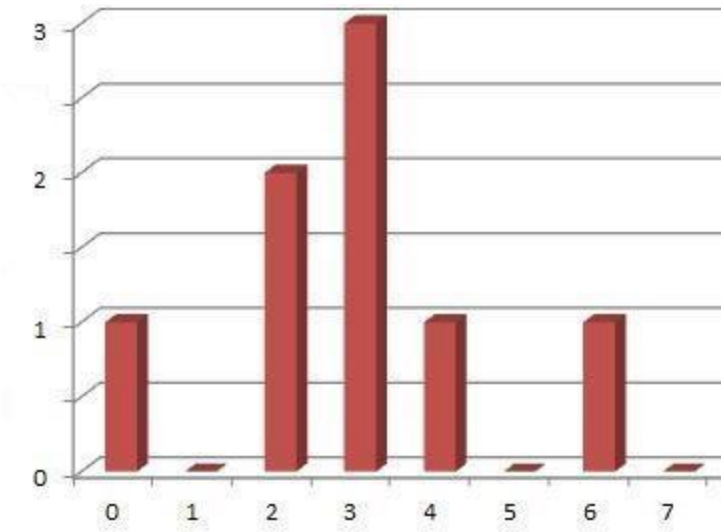
Question Seven: On a scale from 1-10, how important is getting the recommended daily amounts of fruits and vegetables to you? Over half the students (57%) indicated above average importance for themselves.



Question Eight: On a scale from 1-10, how important is getting the recommended daily amounts of fruits and vegetables to your parents? Over half said their parents were above average.



Question Nine: In a typical week, how many days do you get 30+ minutes of exercise? Over half of the students (57%) got at least 30 minutes of exercise each week.



Question Ten: Who prepares food in your home? Students said their parents prepared food at home, and four students indicated they also prepared food in their home.

Question Eleven: Are you more inclined to eat fruits and vegetables because of your involvement in the garden class?

All seven students responded "No" to this question.

Question Twelve: How has gardening affected your preferences for fruits and vegetables?

3 students (42%) said the gardening class had not affected their preferences. One student (Student A) said "It feels the same, I still believe in the importance of fruits and veggies". Another student (student B) noted "I like fruits/vegetables more now that I see how easy it is to actually grow/produce on my own", still another student (student C) answered "I sometimes will try new things because I think it's cool how they grow".

Question Thirteen: What is your favorite meal?

Student A. Chicken soup

Student B. Hamburger and fries

Student C. Lasagna with green beans

Student D. Stir Fry

Student E. Sushi, miso soup and green tea ice cream

Student F. No preference

Student G. Sushi

Question Fourteen: What is your favorite fruit?

Student A. Grapes

Student B. Apples

Student C. Bananas

Student D. Strawberries

Student E. Pineapples and nectarines

Student F. Tomatoes

Student G. Apples

Question Fifteen: What is your favorite vegetable?

Student A. Broccoli

Student B. Carrots

Student C. Carrots

Student D. Potatoes

Student E. Artichokes

Student F. Cucumber

Student G. Green Beans

Question Sixteen: What about this class is valuable to your personal development and health?

Three students declared the class had no value to their personal health. Four students responded that the class was valuable to their health. Student A remarked “I understand how plants are grown from a first person perspective.”, student B noted “To experience actually taking care of the plants that make you healthier”, student C said “It gives me a reason to be patient and how to properly garden”, and student D indicated “It’s a nice break in the day, and anyone can garden as long as they learn how so it isn’t challenging”.

Question Seventeen: What is the most important thing you have learned in this class?

Student A. “To tell the differences between bad fruits and vegetables.”

Student B. “To properly care for fruits/vegetables.”

Student C. “What certain vegetables look like while they are growing.”

Student D. “Tending to a garden.”

Student E. “How to grow different foods.”

Student F. “The most important thing I learned was that all plants have a specific temperature for ideal growth.”

Student G. “How to grow garlic and good healthy eating.”

Question Eighteen: Do you enjoy produce you have grown better than produce you get from the market?

4 of the 7 students (57%) admitted they enjoyed produce they grew better than produce from the market.

Question Nineteen: Would you recommend this class to a friend?

Everyone in the class said they would recommend the class to a friend.

Question Twenty: Do you take ideas/recipes for food you grow in the garden to use in your home? Every student responded “No” to the final question.

Action

The concern that some of the students weren’t getting enough of the nutrients their bodies needed prompted me to have a discussion session with the high school students about the collective results of the surveys and health benefits of increasing amounts of daily fruits and vegetables, as well as a

discussion about how to make healthy and delicious meals with plenty of produce. (See Appendix C.)

Reflections from Results/Conclusion

The results did not entirely discount my hypothesis that students would have a strong preference for fruits and veggies because of their enrollment in the class. While it is true that all the students said "No" to the question "Are you more inclined to eat fruits and vegetables as part of your meals because of your involvement in the garden class?", some of the students reported liking fruits and vegetables more or trying new ones because of gardening. Five (71%) of the students reported eating vegetables at least twice a day. Four students (57%) said they ate fruit at least twice a day. These results suggested that over half of the class are getting adequate amounts of vegetables and fruits daily; a couple of the students needed to address their inadequate intake. Most of the students' favorite meals had vegetables in them, and all of them have potential to integrate produce into the meals. For students who reported eating enough fruits and vegetables each day, this was due to healthy habits formed prior to enrollment in the class. For students who weren't eating enough fruits and vegetables each day, addressing the lack of nutrients they were receiving as a health concern could significantly improve their health. Furthermore, repeated growing and harvesting of plants could hopefully in time pique curiosity to try new things and broaden the horizons of their dietary choices.

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Appendix A.

1. What is your gender_____Male_____Female_____Prefer not to answer

2. How old are you?(Please write number)_____years _____prefer not to answer

3. What race/ethnicity do you identify with?_____African American_____ European/Caucasian

_____Middle Eastern _____Asian _____Latino(a)/Hispanic

_____Other: (please specify) _____Prefer not to answer

4. In a typical day, how many of your meals/snacks include vegetables? 1 2 3 4+

5. In a typical day, how many of your meals/snacks include fruit? 1 2 3 4+

6. Are you involved in gardening outside of school?

I am only involved in gardening at school_____ I am involved in gardening at home also_____

7. On a scale from 1-10, how important is getting the recommended daily amounts of fruits and vegetables to you?

(1 Being least important, 10 being of greatest importance)

1 2 3 4 5 6 7 8 9 10

8. On a scale of 1-10, how important is getting the recommended daily amounts of fruits and vegetables to your parents?

(1 Being least important, 10 being of greatest importance)

1 2 3 4 5 6 7 8 9 10

9. In a typical week, how many days do you get at least 30 minutes of exercise?

0 1 2 3 4 5 6 7 8 9 10

10. Who prepares food in your home (including yourself)

11. Are you more inclined to eat fruits and vegetables as part of your meals because of your involvement in the garden class?

Yes No

12. How has gardening affected your likes and dislikes of fruits and vegetables? Please elaborate.

13. What is your favorite meal?

14. What is your favorite fruit?

15. What is your favorite vegetable?

16. What about the garden class is valuable to your personal development and health? Please elaborate.

17. What is the most important thing you have learned in this class?

18. Do you enjoy the produce you have grown better than produce you from the market?

Yes No

19. Would you recommend this class to a friend?

Yes No

20. Do you take ideas/recipes for food you grow in the garden to use in your home?

Yes No

Appendix B.

CALIFORNIA STATE UNIVERSITY, MONTEREY BAY
100 Campus Center, Seaside, California 93955-8001
College of Professional Studies
Liberal Studies Department
(831) 582-4376 FAX (831) 582-3356

Consent to Participate In Human Subject Research

I, Wesley Caleb Ellison, would like you to participate in a research study conducted by myself, a Liberal Studies student, to be used for my capstone project dealing with school gardens and fruit and vegetable consumption at California State University, Monterey Bay (CSUMB). The purpose of this research is to investigate how school gardening affects preferences for fruits and vegetables. You were selected as a participant in this study because of your involvement in the garden class.

If you decide to participate in this research, you will be asked to answer the survey questions to the best of your ability and with

honesty. Your identity will not be disclosed to anyone besides myself. If you do not want to participate, you don't have to do anything.

Any information that is obtained in connection with this study that can reveal your identity will remain confidential and will only be disclosed with your written permission as required by law. Taking part in this survey is entirely up to you. You can choose whether or not to be in the study. If you volunteer to be in this study, you may withdraw at any time without consequences of any kind. You may also refuse to answer any questions you do not want to answer and still remain in the study. The investigator may withdraw you from this research if circumstances arise which warrant doing so.

If you want to know more about this research project or have questions or concerns, please call me at 831-320-2895, or email me at wellison@csumb.edu. You may receive a copy of this consent form upon request.

The project has been reviewed and accepted by the Committee for Protection of Human Subjects (CPHS) California State University Monterey Bay's review board for research involving humans as subjects. You may withdraw your consent at any time and discontinue participation without penalty. You are not waiving any legal rights, claims, or remedies because of your participation in this research study.

If you have questions about CSUMB's guidelines and policies for human subject research involving human subject research, they're posted online at: http://spo.csumb.edu/guidelines. To speak with someone about human subjects, please contact the CPHS Chair, Dr. Chip Lenno, at (831)-582-4700, clenno@csumb.edu, or in person at CSU Monterey Bay, 100 Campus Center, Media Learning Center (Building 18), Seaside, Ca 93955.

Thank you for considering participation.

Sincerely, Wesley Caleb Ellison

Liberal Studies Department, CSUMB

Consent Statement

I understand the procedures described. My questions have been answered to my satisfaction and I freely agree to participate in this study. I know what I will have to do and that I can stop at any time. I have been given a copy of this Consent Form if I have requested it.

Signature Date

Signature of Researcher

In my judgment, the participant is voluntarily and knowingly giving informed consent and possesses the legal capacity to give informed consent to participate in this research study.

Signature of Researcher Date

Appendix C.

Action Project Handout: The Health Benefits of Fruits and Vegetables

Prepared by Wesley Caleb Ellison

Issue (Why is this Important?)

Unhealthy eating has been identified by the American Medical Association as the most prevalent chronic disease risk factor among 12-17 year olds in the United States.

Most middle and high schools send mixed messages to students; They are encouraged to eat healthy in physical education and nutrition classes, yet most schools offer a wide assortment of foods and beverages that consist of highly processed products rich in added fats and sugars, with very little fresh fruit and vegetable options. What is up with that?

Based on data from the American Medical Association's 2010 National Youth Physical Activity and Nutrition Study, fruit and vegetable consumption is quite low among high school students. In that year, median consumption was 1.2 times per day for both fruits and vegetables. Furthermore, about one in four high school students consumed fruit less than once daily, and one in three consumed vegetables less than once daily. Yikes!

Collective Results of the Surveys

There were some interesting findings in these surveys. Some of them include:

1. Five of you are eating vegetables at least two meals a day. Two of you said only one meal a day included vegetables.

2. Four of you are eating fruit at least two meals a day. Three of you said only once a day.

3. Five of you indicated 7 or higher on a scale from 1-10 regarding how important getting the recommended amounts of fruits and vegetables daily. Two of you listed five or lower.

4. When asked "Are you more likely to eat fruits/vegetables because of garden involvement?", all seven of you answered "no".

5. Three of you said this class had no value to your personal health/development, and 4 of you said it did in

some way.

6. All 7 of you said you would recommend this class to a friend.

7. All 7 of you indicated that you don't take ideas/recipes home for food grown in the garden.

Based on these results, I applaud those of you getting adequate fruit and vegetable intake, and encourage those of you who may not be getting enough fruits and vegetables to reexamine your current eating habits. There are limitless ways of making any meal you like healthy and delicious by integrating fruits and vegetables in your meals, and your body will be more resilient to disease as you do so.

Health Benefits

The average American gets a total of just three servings of fruits and vegetables a day. The latest guidelines call for five to thirteen servings of fruits and vegetables a day (2 ½ to 6 ½ cups per day, depending on one's caloric intake, body weight, and exercise regimen.

Some Fruits and Vegetables that Promote Health and Wellness

Leafy Greens! Bok choi, lettuce (darker varieties are more nutritious), mustard greens, Swiss chard.

Cruciferous Vegetables! Broccoli, cauliflower, cabbage, Brussels sprouts, kale.

Citrus Fruits! Oranges, lemons, limes, grapefruit.

Berries! Strawberries, blueberries, blackberries, raspberries.

What are some delicious ways to incorporate fruits and vegetables into your meals?