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A Biological Lens on Food Deserts [Biology]

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- Please describe the assignment development process. For example, was it developed and/revised during a CTL seminar, mini-grant, assignment development workshop, part of a classroom/experiential learning project?

SCB101 is a non-major biology course. In Fall 2022, the course was designated as an Experiential Learning-LaGuardia Humanitarian Initiative (LHI) course in CUNYFirst. LHI is LaGuardia's experiential learning program that helps students to critically reflect on global issues and develop sustainable solutions in partnership with local and global organizations. For the 2022-2023 academic year, LHI focused on two United Nations Sustainable Development Goals (UNSDG): Goal 2 and Goal 10. UNSDG 2 aims to end hunger, achieve food security, improve nutrition, and promote sustainable agriculture. UNSDG 10 addresses reducing inequality both within and among countries. Thus, I developed an assignment to help students examine food deserts in an urban area with the overall goal being to understand the impact of food deserts in our communities and how they contribute towards perpetuating food insecurities and injustices. Students were encouraged to independently define food deserts and relate the term to urban areas. By the end of the course, students should be able to define food desert, become familiar with mapping and scaling to show food sources in their community, analyze the data obtained to make a rational conclusion regarding food deserts in an urban community. By the end of the course, students should be able to demonstrate the skills necessary to understand and apply scientific concepts such as obesity, and reasoning like data analysis, graphing.

Furthermore, the assignment allows students to further their learning by using statistical data to identify food deserts and explain how populations that live in food deserts are affected both biologically and economically. The assignment also asks students to map their community by showing the location of food places within a 5 mile radius from their homes. After determining the location of food places within their communities, students are asked to consider whether the foods served in these places are healthy.

In the latter part of the semester, students are introduced to human physiology and complete a basal metabolic rate (BMR) lab activity. At the completion of the lab, each student is aware of the amounts of protein, carbohydrates, and fats they need on a daily bases. Having this information at hand, students can plan their daily diets accordingly. Students can use the information obtained in the lab activity to advocate for healthier food options available to them in their communities. This is particularly important for the student/students who find they do not live in a food desert due to the number of fast-food restaurants, bodegas, and delis located in their community. Students will begin to note whether obtaining food from these sources is best for a healthy diet. Finally, students developed an action plan to address the biological and economic impact of food deserts by writing letters to their local, state, or congressional representatives. Students who did not live in a food desert examined the health statistics in their communities.

- How the assignment meets the course learning objectives and the dimensions of the Core Competency, Communication Ability, and the program to which it is aligned.

By the end of the course, students should be able to demonstrate the skills necessary to understand and apply scientific concepts and reasoning, such as making observations, testing hypotheses, data analysis, and evaluation. This experiential learning assignment aligns with the learning objective of inquiring about a problem and identifying strategies to address the problem of food insecurity,

as mentioned above. Below is a brief outline of the steps implemented to achieve the goals for the assignment:

First, students gathered community demographic data (population size, median income, race/ethnicity). This will help them become more knowledgeable with obtaining and synthesizing data from governmental agencies like the United States Census Bureau and Centers for Disease Control. Furthermore, the assignment will allow students to become familiar with their US, state, and local representatives.

Next, students map the location of food sources in their community. Students used a 2-4-mile radius from their home to determine the number of supermarkets, bodegas, dollar stores, and vegetable markets. Identifying accessible food sources allowed students to gain a better understanding of the definition of food desert.

Finally, students synthesized the information obtained in the previous assignments to determine whether they live in a food desert. Students are given two choices on this assignment. If they live in an urban food desert, they can advocate for more supermarkets and restaurants that can bring healthy food options to their community. Thus, writing letters to their local representatives (obtained in assignment #1), students can use the data obtained to support their claim that an urban food desert needs funding to promote a healthier community.

- Which course the assignment was used or might be used in and where this course is located in your program curriculum map (baseline, midpoint, capstone).

The assignment was used in SCB101, a non-majors biology course. The course fulfills LaGuardia's general education requirement under the Life and Physical Sciences category.

- Who the students primarily were—majors, non-majors, beginning, advanced. Students enrolled in SCB101: Topics in Biological Sciences are non-majors.

- How much time it is likely to take students to complete the assignment (a few hours, a week, several weeks, etc.).

This was a scaffolded assignment done in a 12-week semester. Students completed the first assignment by the end of week 3. The second assignment was due by the end of week 5. The final assignment was due by the end of week 8.

- What percentage of the final grade the assignment is worth.

The assignment is worth 15% of the final grade. The assignment is divided into three parts. Scaffolding the assignment will allow students to synthesize the information gathered, thus giving them a chance to share and ask questions as they complete each part. Furthermore, scaffolding will allow students to retain information and use it to build on what they know. Below is a breakdown of each assignment.

Part I – My community's demographics, local, state, and congressional representatives (2%)

Part II – Mapping my community (5%)

Part III – Action plan and Reflection (8%)

SCB101 LHI Assignment – Spring 2023

Your assignment will incorporate LaGuardia Humanitarian Initiative's focus on the global issue of hunger and food justice. We will explore the United Nations Sustainable Development Goal 2 (Zero Hunger) and Goal 10 (Reduced Inequalities) from the perspectives of our own communities. In other words, we will investigate the global issue in local contexts. ***The overall goal of this assignment is to understand the impact of food deserts in our communities as it relates to food insecurities and injustices.*** To reach this goal, there are three assignments that you will complete over the course of the semester. Each assignment will lead to the other, culminating in a final written assignment. Details of each assignment is described below.

Breakdown of Assignment Grade

Assignment #1 (2%): Local, State and US Congressional Representatives

- Completed Table 1 (0.5%)
- Completed Table 1 (0.5%)
- Reflection (100-150 words) (1%)

Assignment #2 (5%): Map of my Community (Do I live in a food desert?)

- Labeled map (3%)
- Reflection (150-250 words) (2%)

Assignment #3 (8%): Reflection and Action Plan

- Using the information you obtained in assignments #1 and #2, write 600-700 words on your next step(s). (**Choose any one of the below two options below**)
 1. Describe an action plan you will take to address your issues in your community as it relates to food deserts. Mention your plan by writing a letter to your local, or state, or US Congressional representatives. In your letter you should state the issues in your community and actions you would like to see on the political level to make changes in your community to address food deserts.
 2. If you do not live in a food desert, what is the quality of food offered in the food places in your neighborhood? Do you see a correlation? Explain.
 - How healthy is your community? (**How healthy is your community?** <https://www1.nyc.gov/site/doh/data/data-publications/profiles.page#qn>)

Assignment #1: Locating your local, state, and US Congressional Representatives.

Task: Using the links provided below complete Table 1 and Table 2.

Table 1. Local, State and US Congressional Representatives

New York State Assembly Member and District	New York Senator and District	US Congressional Representative and Congressional District	US Congressional Senators for New York State

Table 2. Community Demographics

Population Density	Median Age	Median Income	Race (%) (Black, Hispanic, White, Asian, Native American, Pacific Islander)	Gender (%)

Guided Reflection Questions:

- What was most surprising about your findings on your community demographics?
- How do you think you can use this information?
- Did you know the names of the individuals who represent your community at the local, state and federal level?
- Do you feel your representatives are addressing issues like food deserts in your community?

Assignment #2: Map of my community: Do I live in a food desert? (5%)

Task: Provide a labeled map of your community

- Use Google maps to indicate distances (within 10 miles of home) of:
 - Supermarkets
 - Bodegas
 - Dollar Stores (Family Dollar, Dollar Tree, Dollar General, etc)
 - Walmart and Target Superstores, BJ's, Costco
 - Fast food restaurants (McDonald's, Wendy's, Burger King, Taco Bell, etc)

Guided Reflection Questions:

- What was most surprising about your findings when searching for food resources near your community?
- Based on the definition of food deserts, do you live in a food desert?
 - If so, did you know you lived in a food desert?

- Do you see a relationship between **Table 2: Community Demographics** and your community map?
- How would you summarize your findings if you were to talk to your representatives?

Assignment #3 (8%): Action Plan

- Using the information you obtained in assignments #1 and #2, use 600-700 words to write about your next step(s). (**Choose one of the below options**)
 1. Describe an action plan you will take to address your issues in your community as it relates to food deserts. Draft a letter to your local, or state, or US Congressional representatives stating your action plan. In your letter you should state the issues in your community and actions you would like to see on the political level to make changes in your community to address food deserts.
 2. If you do not live in a food desert, what is the quality of food offered in the food places in your neighborhood? Do you see a correlation? Explain.
 - How healthy is your community? (**How healthy is your community?** <https://www1.nyc.gov/site/doh/data/data-publications/profiles.page#qn>)
- Please follow the rubric which will be used to grade your assignment

Grading Rubric for Assignment #3

	1 Does not meet	2 Partially meets	3 Meets	4 More than Meets	5 Exceeds
Title	Title is absent	Title is somewhat clear	Title is clear but provides little detail	Title is clear and provides specific details on the topic of the paper	Title is exceptional, clever and provides specific details on the topic of the paper
Introduction	There is no clear introduction or main topic; structure of paper is missing; purpose of report missing	The introduction states the main topic but does not adequately preview the structure of the paper; purpose of report is unclear	The introduction states the main topic and previews the structure of the paper; purpose of report is unclear	The introduction states the main topic and previews the structure of the paper; purpose of report is present and clear	The introduction is engaging, states the main topic, presents a clear preview of the organization of the paper purpose is present
Body	The body of the paper fails to meet/support main idea of the paper	Most paragraphs meet/support the main idea of the paper; each paragraph has some supporting sentences	All paragraphs meet/support the main idea of the paper; each paragraph has some supporting sentences	All paragraphs meet/support the main idea of the paper; each paragraph has some supporting sentences	All paragraphs meet/support the main idea of the paper; all paragraphs have supporting sentences; the body is engaging

Conclusion	Incomplete/unfocused	The conclusion is present but does not adequately summarize the paper; does not restate thesis in any way	The conclusion is present and provides an adequate summary of the paper; thesis is restated word for word	The conclusion is present and provides an adequate summary of the paper; thesis is revisited	The conclusion is present and engaging; provides an exceptional summary of the paper; thesis is revisited
References are properly formatted (APA or MLA)	References not included	References are present; most in correct format	Minimum requirement of references are present; most in correct format and all are referenced in paper	Minimum requirement of references are present; all in correct format and referenced in paper	More than the required references are present; all in correct format and all are referenced in paper

Appendix I

Links provided below can be used to help obtain data the assignments.

United Nations Sustainable Development Goals

Goal 2: Zero Hunger - <https://www.un.org/sustainabledevelopment/hunger/>

Goal 10: Inequality - <https://www.un.org/sustainabledevelopment/inequality/>

NYS Assembly

<https://nyassembly.gov/mem/>

NYS Senate

<https://www.nysenate.gov/find-my-senator>

United States House of Representatives

<https://www.house.gov/representatives/find-your-representative>

US Senators

<https://www.senate.gov/senators/senators-contact.htm>

NYC Health Indicators by Race/Ethnicity, 2017-2019

<https://www.health.ny.gov/statistics/community/minority/county/newyorkcity.htm>

US Census Data

<https://www.census.gov/data.html>

How healthy is your community?

<https://www1.nyc.gov/site/doh/data/data-publications/profiles.page#qn>

Literature on Food Deserts

Food insecurity and food deserts

<https://www.canr.msu.edu/news/food-insecurity-and-food-deserts-how-are-they-related>

Food Insecurity

<https://www.healthypeople.gov/2020/topics-objectives/topic/social-determinants-health/interventions-resources/food-insecurity>

What are Food Deserts? All You Need to Know

<https://www.healthline.com/nutrition/food-deserts>

NPR Report

<https://www.npr.org/2020/09/27/912486921/food-insecurity-in-the-u-s-by-the-numbers><http://www.fao.org/3/MR173EN/mr173en.pdf>

Prevalence of Food Insecurity and Living in a Food Desert among Individuals with Serious Mental Illnesses in Public Mental Health Clinics

<https://drive.google.com/file/d/1Jpm5mJouu6luyU-Hob3lVMQlRC5YmJJd/view?usp=sharing>

Food Insecurity, Food “Deserts”, and Glycemic Control in Patients with Diabetes: A Longitudinal Analysis

<https://diabetesjournals.org/care/article/41/6/1188/36449/Food-Insecurity-Food-Deserts-and-Glycemic-Control>

Resources on Food Deserts

Interactive Web Tool (Food Deserts, Maps)

<https://www.usda.gov/media/blog/2011/05/03/interactive-web-tool-maps-food-deserts-provides-key-data>

USDA Economic Research Service

<https://www.ers.usda.gov/data/fooddesert>

USDA Food Access Research Atlas Interactive Guide (interactive map: Low income, low access, vehicle access, etc)

<https://gisportal.ers.usda.gov/portal/apps/experiencebuilder/experience/?id=a53ebd7396cd4ac3a3ed09137676fd40>

Mapping Food Deserts in Manhattan and Bronx

<https://medium.com/@olivialimone/mapping-food-deserts-and-swamps-in-manhattan-and-the-bronx-46c6d8fc0804>

June 2022 report from CBS News, NY on Food Deserts

<https://www.cbsnews.com/newyork/news/food-insecurity-remains-big-problem-in-more-than-2-dozen-neighborhoods-in-new-york-city/>

May 2021 report from PIX News: Why Food Deserts Persist in Low-Income NYC Neighborhoods

<https://www.youtube.com/watch?v=Ux9siEMDxjo>