



Liberal Studies Program

Signature Assignment for SCED 401 Research Project

Student Learning Outcome(s) Assessed:

SLO #3: Demonstrate Proficiency in Natural Sciences Subject Matter.

Description of the Signature Assignment

Candidates will apply the experimental and observational skills used by all scientists to answer a question while doing an investigation. Candidates will devise a question that they would like to know more about. This is a question that candidates can research doing real-world investigation, as opposed to doing library research. They will then design and implement investigations to find the answer(s). Finally, they will analyze and interpret what they have found and create a way to communicate their findings.

Directions for Students

In this assignment you will apply the experimental and observational skills used by all scientists as you attempt to answer a question while doing an investigation. You will devise a question that you would like to know more about. Note that this is to be a question that you can research doing real-world investigation, as opposed to doing library research. You will then design and implement investigations to find the answer(s). Finally, you will analyze and interpret what you have found and create a way to communicate your findings. This assignment takes longer than most. You must begin several weeks before it is due. This assignment counts more than any other toward your final course grade.

Getting started and planning your project:

- 1) Brainstorm a list of topics related to questions you could investigate. You might consider some of the investigations you've done in this class so far or our discussion of researchable questions. You might also consider what you do when you are not in class (work, hobbies) as these may provide ideas as well. Take a minute and look around—what are some questions that you might ask?
- 2) Narrow your list of questions to one that is researchable and can be explored given the time and monetary constraints of the class. As you refine your question, be sure you can explain what it is you want to find out and why that is important. Avoid getting too complex—try to focus on two variables and look for a correlation or connection between them. (e.g. If I do x, what happens to y? Or when p increases, does q increase as well?) Also avoid yes/no questions—consider looking for trends rather than definitive 'black and white' answers. (E.g. Avoid things like 'Who wears sweatshirts more often, boys or girls?')
- 3) Design an effective test that will address your question. Be sure to consider sample size, as well as what data you will actually be measuring/collecting. Remember our discussions related to variable types (continuous, ordered and categorical) and measurement. Provide enough detail so that others could get the same results as you if they repeated the test. **For this project, CSULB student surveys are not permitted and opinion polls should be avoided.** (Please see me if you have questions.)

- 4) I strongly recommend that you conduct a pilot test. A pilot test is a way to check out your experimental ideas before investing large amounts of time and energy. After a pilot test, students often make small changes at this point that make their project a little easier or better. Think of this as an opportunity to refine your question(s) or procedure. Record your raw data, and briefly describe what this “pre---test” tells you.
- 5) When you have your question and your strategy for testing, carry out your investigation. Record your data. Begin interpreting your results, trying to understand what they mean. Are you able to answer your question? What conclusions can you begin to draw at this point? How confident are you in your findings?
- 6) Summarize your data in an easy-to-read table.
- 7) Create **at least one graph**, prepared using MS Excel, or some other graphing program. This graph should be incorporated into your report, although it can be included as an appendix. (Be sure to mention in the text if you have graphs in the appendix.)

This assignment involves both a written report and a brief in-class presentation

The **written report** should include:

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- a) an **introduction and background** to your question. Be sure this sections addresses the following questions:
 - i. What is the research question?
 - ii. Why is this question important or relevant? (Why should we care?)
 - iii. What background do we need to understand the question? (Be sure to provide any necessary references for your background.)
 - b) a description of your **procedure**; This section should include:
 - i. identification of the dependent and independent variables
 - ii. explanation of how and why other variables were controlled
 - iii. steps followed in conducting the test
 - c) **table(s)** summarizing data;
 - d) **computer-generated graph (at least one)** that summarizes data;
 - e) discussion of you **findings**. What did you discover? How well was the data able to (or unable to) answer the question(s) you posed. Be sure to include **discussion of limitations of the data**;
 - f) **analysis and conclusions**, WHICH SHOULD ADDRESS EACH OF THE FOLLOWING POINTS:
 - i. Evaluate your study in light of the information and criteria you learned regarding what makes for a good test, such as **variable control and validity, sample size, reliability, and elimination of bias**. If you find things you wish you had done differently, discuss those as well;
 - ii. Briefly **discuss any modifications** you needed to make along the way. This could include changing your procedure, changing the database used, or even modifying your question. Be sure you explain why you made those changes. (If you *completely* change your question along

the way to something completely different, you don't need to discuss that here—instead, just focus on the changes you made to your final idea.);

- g) **use of references.** As you pull together your project, you will need to support your statements, either with evidence or references from class readings. You are expected to include at least two references to class readings or other sources. Such references are often included as part of the introduction, description of procedure, or analysis.
- h) The **presentation** will be a **poster or video** that describes your work. This visual aid should include your **question**, a **description of your test**, your **findings** and **whatever other information that will help others understand** what you discovered.

ADDITIONAL INFORMATION

- This project should NOT be an extension of the consumer product testing. Although your test may involve consumer products, the goal of the investigation should not involve finding the 'best' brand or version of a particular product.
- You might consider using pre-existing data available via the Internet. For instance, you may want to look at whether there's a relationship between the average age of a state resident and the average income of a state resident. You would still need to come up with a good rationale for wanting to compare these (i.e. Why is this important?) and a description of how you accessed this data. **Before you go down this path, you'll need to talk with me about whether this is feasible.** You should also check to see if such data is available!
- You may work on this project **on your own OR with a partner. This must be a *different partner* than the person you worked with on the Consumer Product Testing assignment.**
- The report must be typed (double spaced, 12 pt. type, 1 inch margins) and should be 6-8 pages in length (not including data tables or graphs). The assignment will be worth 120 points and is worth roughly 25% your final grade.
- In addition to the report, you will also be asked to submit a two page reflection on the project. This will be submitted individually

Checkpoint

Although your final project will not be due until the end of the semester, there is a required checkpoint along the way. At this checkpoint, you will be expected to have completed steps 1-3. At that time, you will submit a **progress report** that includes the following:

- a) The **question** you are planning to investigate;
- b) A brief description of your **procedure**, including *how you will collect data* and *what materials you'll use*. You should also discuss *sample selection* and *sample size or number of trials*.
- c) **Any problems** you might anticipate in conducting the test, and ideas for managing these problems.

This is worth 10 points and will be submitted via dropbox. Failure to complete the progress report will result in a loss of points, but may also have considerable impact on your final project, as you will not receive the feedback necessary to ensure the successful completion of your assignment.

Scoring Rubric:

		Score:	Comments:
Criteria 1 Introduction/ Background	- Is your question clearly stated? - Is there a clear rationale for the study (why is this important to you and others - this is the "so what?" factor)? - Do you provide background info the reader needs to understand what you did and why s/he should care?	/10	
Criteria 2 Procedure (what you did and why)	- Can someone easily understand what you did, based on your description? - How adequately and thoroughly does your procedure address your question(s)? - Do you identify dependent and independent variables and control for other variables (where appropriate)? - Do procedures demonstrate efforts to maintain validity and reliability? - Did you do a pilot study? How did this shape your study?	/25	
Criteria 3 Findings	- Are data tables/charts and graphs included? - Is the data is summarized in table/charts easy to read and understand in a glance? - Is the appropriate type of graph included? - Do you summarize your data-----clearly and briefly? Did you avoid simply repeating the same information that is in the table? - Did you discuss any limitations to the data?	/25	
Criteria 4 Analysis & Conclusions (interpretations of the results and the study overall)	- Do you interpret your results, helping readers understand what the results mean? - Is interpretation/analysis based on the data presented? - Did you discuss any variations in your procedure made along the way? - Do you evaluate your study in light of the information and criteria you learned about in class readings regarding study aspects like reliability, validity, controlling variables, and bias? (as discussed in Gott & Dugan, Carey, or other readings)	/20	
Criteria 5 Other Aspects of your Study	- References (at least two from readings) - Formatting & length OK (6-8 pages)? - Clearly organized - Punctuation, grammar, spelling, and mechanics are appropriate. Sentence form and word choice are varied and appropriate.	/10	
Criteria 6 Class Presentation (summary of your research & findings)	- Is it easy to follow? Is it well-organized? - Is your research question clearly stated? - Does the presentation capture the main ideas of your investigation?	/10	
Overall Score		/100	

Legend

Total Points	College of Education Assessment Scale Equivalent
90-100	4 (Exceeds Expectations)
80-89	3 (Meets Expectations)
70-79	2 (Meets Some Expectations)
60-69	1 (Does Not Meet Expectations)
< 59	0 (Can't Score)