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Course Development Grant: Data-Driven Inquiry in a Large Introductory Economics Class

Awarded: Summer 2018

Project Goal: To introduce students to the process of collecting and analyzing data about the local economy.

Quarter Implemented: The project will be implemented in two Principles of Macroeconomics classes (around 50-60 students each) to be taught in Winter 2019.

Description of Project: The project involved introducing students to economic data sources such as the Bureau of Labor Statistics, the U.S. Census Bureau, and Bureau of Economic Analysis. It also involved introducing students to some basic techniques for visualizing and analyzing that data.

How the Project was Implemented: See the attached "Record of Work" for details. I began by researching economics data websites and assembling the information about each website into a succinct one-page "how-to" guide for navigating each website. These guides show students how to get to the website, how to navigate it to find data, and they include a short discussion of the major features of each site. I assembled all of this into a packet and then wrote a "Table of Contents" page which allows students to find the website they need depending on what they are looking for (e.g., for unemployment at the county level they go to one site, for wages in the Inland Empire they go to a different site).

I then moved on to developing the modules for instruction. The first part of this step involved referring to statistics textbooks and other pedagogy-based texts for how to teach data visualization and analysis at an introductory level. I ultimately decided not to include any actual statistics analysis – like mean or standard deviation – in the modules. Instead I focused on more basic techniques like calculating percentage changes and comparing rates of growth, drawing a scatterplot from existing data, and teaching students how to organize data into tables and figures.

The second part of developing the instructional modules involved writing a series of case studies to be used in class as applications of the both the economics and data aspects of the course. The cases studies are all based on issues with the local economy and involved some research into local news articles, as well as making sure there was sufficient data to address the case studies in class. I chose four topics, assembled data and slides on them, and made one case study into a problem set question. The topics were: the recent effects of the minimum wage increase in Los Angeles on restaurant prices using Bureau of Labor Statistics price data; the relationship between unemployment and inflation in the Inland Empire; the effects of shifting the Ontario International Airport back to local control by comparing Ontario and Fontana labor markets; the effects of the recent boom in the housing market on wages in the Inland Empire.

The next step for implementing the project was assembling problem set questions that would be used to assess students on this new content. I broke up the problem set questions into 3 parts based on the difficulty and techniques addressed: "Basics of data visualization and interpretation"; "Application of data manipulation techniques to real-world economic data"; and "Advanced techniques in data visualization and interpretation". Since I am teaching two quarters of the course and because I wanted to leave some options for which questions to use (depending on how the students are doing), I developed 5 questions in the first category, 3 questions for the second category, and 2 questions for the last category. The questions range from asking students what is the best way to visualize a given piece of data (chart, figure, line graph, etc.) to describing a scatterplot of educational attainment and median income for counties in Southern California.

The final step was to write a short survey instrument that assesses student's knowledge (in an informal way) about their local economy before and after the new course content has been introduced.

Results of the Project: Two new sets of PowerPoint slides for two new lectures on data collection, visualization, and analysis; one new set of PowerPoint slides detailing information about three local economic case studies which apply concepts and techniques from the course material; 13 new problem set questions; one informational packet detailing how to use 6 different economic data websites; one (before and after) survey instrument assessing students' knowledge of the local economy.

Additional Comments: This project forced me to think about the most useful tools and techniques that a student should take away from an introductory economics course. Instead of focusing on mean, median, and mode (as all statistics classes do and which I planned to do originally) I decided to hone in on more basic but real-world techniques like knowing how to access and present data, which will also engage students more because the content is more concrete. Incidentally, this approach also allowed me to more easily integrate economics data sources from the local area. The reason for this is because we don't have easily accessible microdata for the Inland Empire, so a task such as "calculate the average unemployment rate" or "calculate the average wage" wouldn't have as much meaning as simply tracking how the unemployment rate or wage rate has changed over time, or comparing unemployment rates and wages across different cities or counties.