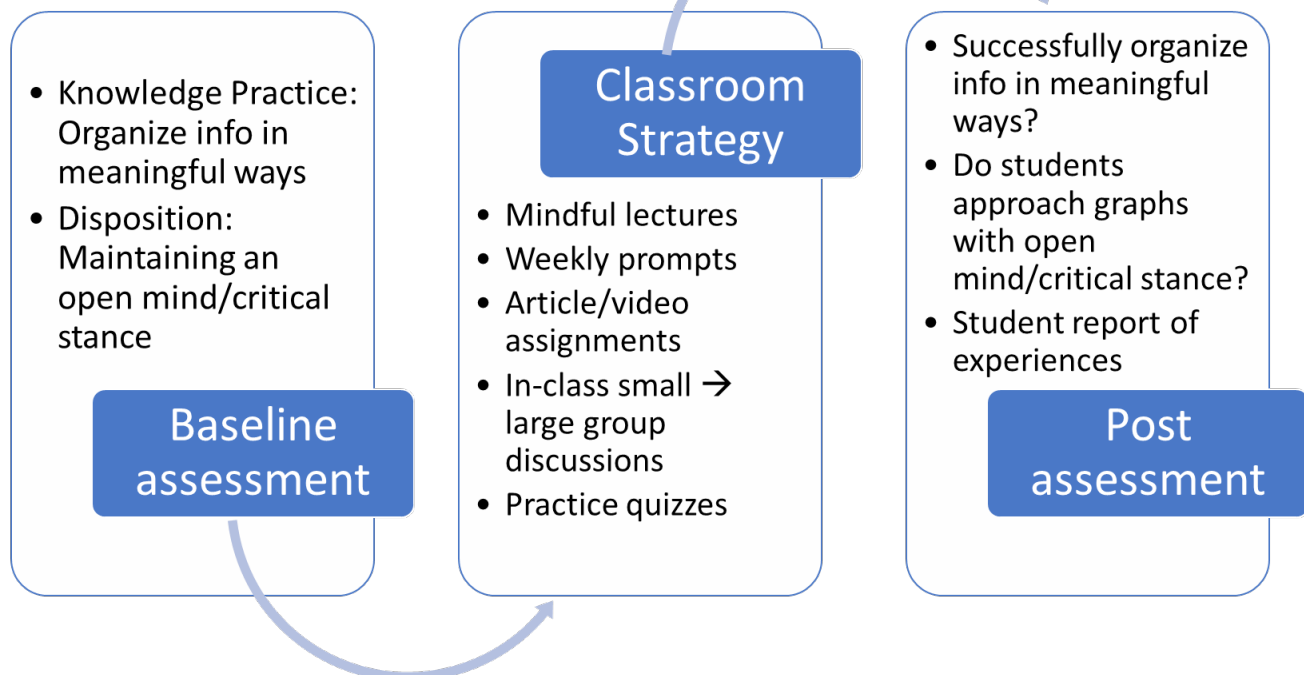Benjamin J. Becerra

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Critical Information Literacy Workshop

Background and Purpose

ADMN 210 Applied Business Statistics is a course that involves communicating business-related quantitative and qualitative measures to intended audiences, such as stockholders, laypersons, etc. While statistics is traditionally viewed as a math class, there is a sizable portion that requires non-quantitative skills: the "art" of statistics. One particularly important aspect is that of creating figures and tables to convey information in a graphical format. However, organizing information in meaningful ways is often a challenge, potentially due to the tacit knowledge required in understanding what constitutes an effective visual display. Based on my experiences, the students often reach a bottleneck in not knowing what information to use to produce a figure, which requires a skill in having an open mind and critical stance. While critical to a student's coursework, the ramifications for not understanding basic graphical information literacy reach beyond the academic life, as there may be potential limitations in career paths, misinformed choices in personal finances, etc. Therefore, the purpose of this project is to (1) assess the current state of information literacy in the classroom to identify baseline graphical information literacy, (2) implement strategies tailored to improve skills, and (3) evaluate for change in graphical information literacy.

Frame: Research as Inquiry

- Knowledge Practice: Organize info in meaningful ways
- Disposition: Maintaining an open mind/critical stance

Baseline assessment

Classroom Strategy

- Mindful lectures
- Weekly prompts
- Article/video assignments
- In-class small → large group discussions
- Practice quizzes

- Successfully organize info in meaningful ways?
- Do students approach graphs with open mind/critical stance?
- Student report of experiences

Post assessment

Classroom Strategy

Baseline assessment will reveal how students organize information in graphs, and the choices they make will suggest their ability to maintain an open mind and critical stance. Following review of this information, a series of activities and teaching modifications will be incorporated in the classroom, based on best practices from online resources and consultation with CSUSB Pfau Library.

Mindful lectures.

Given the importance of graphical information literacy in introductory statistics, there will be specific efforts to develop a mindset of critical analysis towards figures. At least 50% of lectures will incorporate a figure and discuss its characteristics, as well as any of the choices that are being made for each part of the graph (*Junk Charts Trifecta Checkup: The Definitive Guide*).

The class will be taught Maybe set up a prompt to refer to the way they present data is how the information is understood. "can you explain/describe how the way this data/information is presented… provides knowledge or influences how it's understood" Begin in the first week to talk like this, come back to it and recognize that the bottleneck is that they aren't sure what data to put in the graph, but because they're thinking how the graph is going to influence the way people understand, hopefully that will help them to choose it appropriately

Weekly prompts.

Students will be provided with weekly prompts, for online discussion board points. This will include pre-made examples of graphs, and students will be encouraged to enter discussion regarding the effectiveness of these graphs. After the 3rd week, students will create their own graphs (as part of a larger group project), and the weekly prompt will encourage them to post one or more for feedback from the larger classroom.

Article/video assignments.

Articles and videos such as from JunkCharts (http://junkcharts.typepad.com) will be assigned for course credit. These resources offer information such as the importance of information literacy in regards to decision making, as well as step-by-step guides for evaluating material.

In class small→large group discussions.

Along with assigned readings/videos, students will come in to have a small group discussion about a particular graph. After discussing in smaller groups, a representative from each group will engage the rest of the class about the summary findings of the smaller group. The prompts for the discussion will include who the intended audience was, when the statistical output was created, etc. These questions are based on the ACRL "Keeping up with Statistical Literacy" recommendations (http://www.ala.org/acrl/publications/keeping_up_with/statistical_literacy).

Practice quizzes.

To provide evaluation throughout the course as well as incentive for learning course material, a series of practice quizzes will be developed to assess students' ability to rate effective graphs. This will be done through Blackboard, or through real-time measures such as Plickers or Kahoot.

Evaluation

A pre-post test evaluation will be given to students at the beginning of the course (Week 1) and at the end of the course (Week 10). Evaluation will be in the form of a quantitative survey instrument, based on the 2002 Statistical Literacy Survey, from the W. M. Keck Statistical Literacy Project (www.statlit.org). This survey will be changed as appropriate for a business statistics course. This survey will be made available in Qualtrics, and other variables of interest that may affect graphical literacy in statistics (e.g. years in school, GPA, major) will be assessed. Statistical differences in survey outcomes will be assessed using the appropriate procedures (e.g. paired t-tests for quantitative data).

In addition, students will also be asked a set of open-ended questions to obtain more qualitative information. Such questions will display examples of graphs that are considered appropriate/effective or not for their intended audiences in Qualtrics. Students can click on the areas within the graphs (using a heatmap feature of Qualtrics), to determine if students can identify specific elements of a graph. Text responses will be analyzed for common themes, with heatmaps evaluated for correct or incorrect responses.

References

- ACRL Keeping up with Statistical Literacy
  http://www.ala.org/acrl/publications/keeping_up_with/statistical_literacy
- Statistical literacy: an important part of information literacy
  https://www.allpurposeguru.com/2013/09/statistical-literacy-an-important-part-of-information-literacy/
- http://junkcharts.typepad.com/junk_charts/junk-charts-trifecta-checkup-the-definitive-guide.html
- 2002 Statistical Literacy Survey http://www.statlit.org