

Conceiving and Measuring Equity

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Introduction

This instructional module is designed for an introductory quantitative methods or statistics class tailored for school and instructional leaders. The assignment borrows statistical tools traditionally used in the field of school finance to measure and discuss equity within a school setting. As applied, these tools are designed to stimulate conversation among school-based data analysis or leadership team about issues of inequity in student performance outcomes.

The instructional module includes the general overview below, the assignment, a datafile for the assignment, and a power point presentation to facilitate a pre-assignment lecture. Students should review the case and start analyzing the prepared dataset in class. The assignment includes guiding questions and asks students to prepare answers to those questions in a professional memorandum. The memorandum should be completed prior to a second class session where their findings can be discussed and linked back to issues of equity reviewed in the assigned readings. The memorandum guidelines also include criteria for assessing the work of the students towards the learning objectives.

The module assumes a working knowledge of Microsoft Excel, a rather ubiquitous spreadsheet package. Directions for the activities are general enough, however, that other statistical packages may be used, including Minitab, Datadesk, or SPSS.

I. Assignment Objectives

The instructional module is organized around four learning objectives:

- A. Students will manipulate secondary data that contains data on student characteristics, and comprehensive examination scores;
- B. Analyze these data using basic descriptive and comparative statistical measures;
- C. Convey information using simple Excel presentation graphics; and
- D. Write selectively and coherently about numbers (equity statistics).

II. Agenda for Module Implementation

Major concepts of equity including the measurement of equity are covered in the following readings:

“The Measurement of Equity”, Chapter 10 of Public School Finance, by Kern Alexander and Richard Salmon.

“The Concept of Equality of Educational Opportunity” James Coleman, *Harvard Educational Review*, Vol. 38, No. 1, Winter 1968.

“Ethical Considerations in an Era of Financial Scarcity” Raymond Calabrese and S. Markus. *Theory into Practice*, Vol. 33, No. 2, 1994.

During class, the instructor should:

1. Introduce the concepts outlined in the power point presentation relying on the general notes. **The power point presentation is offered as a general guide to the instructor.** The instructor should substitute relevant examples of descriptive statistics, measures of central tendency, equity and equal educational opportunity as necessary. Depending on the skill and level of the students, more or less detail should be offered in the pre-assignment lecture (30 min)
2. The instructor should then disseminate the lab assignment and allow students to read and ask questions about the directions. (15 min) following the notes outlined in the slideshow.
3. The instructor should then disseminate the data necessary to complete the assignment, and include an overview of the data. (10)
4. Students should then begin working to answer the questions outlined in the assignment and complete the summary memorandum prior to the next class.

The following class session would likely be devoted to a discussion of the analytical findings as well as a discussion of leadership implications from the findings. Question 7 of the assignment deals is focused on translating the findings into action steps. Some of these concepts will likely emerge and necessitate discussion during the actual power point presentation.

Assignment

****See attached sheet****

*****This case should be distributed to students either before or after the introductory lecture. It constitutes the main part of their assignment****

A Case Study from the John F. Kennedy Elementary School

As the principal of John F. Kennedy Elementary School you generally welcome accurate critiques of your school's performance. You have an open relationship with the education reporters from the City Herald and the County Free Press. Your prompt replies and candid answers to their questions have given you the impression that they take it easy on your otherwise lackluster performance on the New Standards Reference Examination (NSRE). However, the latest article in the paper has created a great deal of contention in the community, among your students' families, and angst within your faculty.

The article coupled school performance with a wide array of commentary from various stakeholders around the community. The article featured a historical overview of JFK's performance on the NSRE, particularly the results from the Mathematics examination. Several faculty and staff were asked to respond to comments from the school board, the Rotary club chairman asked why the elementary school couldn't teach math, and the president of the Chamber of Commerce charged all teachers from 1-4 grade with failing to substantially improve Math test scores. The local head of PAWGS (People Against Wasteful Government Spending) said that the fourth grade teachers ought to foot the bill themselves for each child that failed to make the standard.

The reporter also related the topic of poor school achievement to an unwillingness of the school to engage families. She conducted a group interview in a nearby wealthy neighborhood and offered quotes from three married couples, each with one or two children in the school. One mother of a third grade boy stated the following, "It is clear the school is less concerned with educating the whole child than ever before. When I walk into the school, no one greets me; my son's teacher has never asked me about our family, my son's father, or his illness. The only person to ever ask about his father was a student teacher from a nearby college, and that was when he was in kindergarten." The article reported similar statements from other families.

From a leadership perspective, however, the most irritating comment came from anonymous interview with a teacher from the area middle school who said

It is unfair to judge the performance of our eighth graders on their NSRE's after just 2.5 years of a middle school education when the elementary school teachers have almost six years to make the standard. Our kids are not just coming from behind, in many cases they are restarting.

This comment made you feel somewhat isolated and victimized by a member of your own team. What made it worse is the fact that you had heard the comment before. Just recently you had to really encourage one of your 4th grade teachers to remain in her position rather than seek a transfer to the fifth grade. The stress of being held accountable in the fourth grade was an important aspect of her motivation to move.

With these scores out in the open, you feel it is necessary to cultivate a discussion with your senior leadership team focused on student performance on the Mathematics portion of the New Standards Reference Examination. Your overarching goal is to improve math performance for all students. **In particular you want to focus attention on your fifth graders and insure they are well prepared to enter the sixth grade.** You intend to make the fifth grade remediation project team based and involve faculty from across your school.

As such you have asked each member of your leadership team to review a list of questions and tables that you have prepared in advance of your next meeting.

Specific Instructions for the Assignment:

In preparation for your upcoming meeting you will have to prepare your own answers to the guiding questions. There are six main questions. After analyzing the data, please prepare your answers in a professional memorandum. The idea here is that you should practice drafting short answers and prepare them in a professional format. An instruction sheet will be handed out that describes how to prepare your memorandum.

Please bring your memorandum and summary figures or charts with you to the next class.

1. What percentage of students met or exceeded the standards on each of the four components of the NSRE this year?

Excel task: Calculate the % of students with scores equal to or greater than 3 on each of the four test components.

2. Which students scored in the lowest two performance levels on each of the four components of the NSRE this year?

Excel task: Calculate the % of students with scores equal to or less than 2 on each of the three test components.

3. What is the distribution of scores across all performance levels?

Excel task: Calculate measures of central tendency across the average NSRE scores (average of each of the four measures)

4. Are there gender differences in performance?

Excel Task: Summarize either test component or average NSRE scores by gender.

5. Are there differences in performance related to special education classification?

Excel Task: Summarize either test component or average NSRE scores by classification.

Calculate a measure of horizontal equity. Calculate the coefficient of variation for the average NSRE score.

6. What percentage of students are within 1 standard deviation of the schools average? What are the names of those students?

$$\text{COV} = (\text{standard deviation} / \text{Mean}) \times 100$$

7. Given your findings from questions 1-6 above, please suggest follow-up questions and action steps that address the following questions:
 - A. Have we fully identified the students that are most challenged by the Mathematics portion of the NSRE? What are our next steps?
 - B. Do we have an obligation to redirect resources towards these identified students?
 - C. What are the leadership implications for our school of focusing so intensely on the identified students?

GENERAL COMMENTS ON WRITING PROFESSIONAL MEMORANDA

In a writing style accessible to your intended audience, you should include the following in a memorandum:

1. Summarize the principal research questions(s) and all major implications of your findings;
2. Demonstrate your grasp of the technique or method being used, and

3. Present and analyze your findings in an effective, methodical and interesting manner.

Technical memoranda should be considered professional reports that describe and analyze data using specific analytical techniques and then relate the analysis to a larger context. When appropriate, theoretical considerations or limitations of techniques should be covered briefly.

Your write up should take the form of a professional memorandum. In addition to text, you will find that tables, charts, figures and maps often allow you to communicate your points efficiently and effectively by summarizing and displaying your findings.

Memoranda should be geared to a specific audience, which will usually be specified in the assignment. When writing reports, put yourself in the “shoes” of this person and base your writing on the minimum level of knowledge, interest and time commitment you think this person would have when reading your memorandum. Think of this person as someone with the same basic knowledge and expertise as you had before you did this lab.

Writing up your results is excellent preparation for future responsibilities as an agency leader.

MEMORANDUM FORMAT

I suggest you use the following memo heading (the same as the one which starts this section):

TO: Full Name, Title
FROM: Full Name(s), Title(s)
DATE: Date (Spell it out. For example: February 24, 1995)
RE: Concise, direct subject of your memo (underlined or in bold)

- (1). Purpose
- (2). Methods of Analysis
- (3). Findings
- (4). Conclusions
- (5). Appendices (if needed)

The Purpose: The first part of the memorandum should set out the issue/problem in 2-3 sentences. It should not include a discussion of your results, assumptions, methods, limitations, etc.

The Methods: Follow this introduction with a discussion of your analytic method:

- A. Explain the choice of technique
- B. Describe why it is appropriate
- C. Define and/or detail the method

Techniques should be explained in enough detail and language simple enough so that the reader obtains a basic understanding of the analytical technique, but not an extremely detailed knowledge of it.

Findings: Then, present and analyze your findings. Graphs and tables that summarize and reinforce your results should be easy to read and understand. They should be referred to in the text of the memo and placed within the body of the memo as soon after that reference as possible. (e.g. See Table 4) They should be properly titled and lined up as well. Detailed descriptions of the techniques or data, which are not necessary to understand the basic concepts or results of the analysis, should be placed in an appendix, if necessary. List your data source briefly in the body of your report. If necessary, offer a more detailed reference in the appendix.

Important note about technical writing: Your findings should offer readers a guide to your graphics, but not recite each and every finding from the graphic. Graphics should tell the obvious stories. Your text should highlight the obvious, but focus on important, and subordinate findings. Drawing connections between prior findings is also important here. Simply stated, your text should support and not replicate the obvious findings on your graphs.

Conclusions: Finally, draw your conclusions. If the following are not included elsewhere in your report, put them in your conclusions section:

1. Limitations of your data or technique
2. The implications of your findings;
3. The possible sources of the changes or trends you have observed.

Your conclusion section should place your findings within a broader perspective.

Appendices: All materials referenced in the text. (e.g. charts, figures, tables, maps, etc)

ASSIGNMENT GRADING

Lab Memoranda must be submitted in printed form and will not be accepted electronically. Labs are graded on a point scale.

Labs are graded using scoring rubrics. The following questions are meant to offer you a partial checklist by which you can self-assess the quality of your memorandum.

1. **Content:**
 - Did you have a clear understanding of the concepts and techniques used in the lab and did you explain them clearly?

- Did you adequately discuss your findings and their implications for your audience?
- Did you adequately and appropriately use graphs and figures to reinforce and summarize your findings?
- Have you concluded with some limitations of your data as well as important qualifiers and caveats?

2. **Presentation: 30%**

- Are your graphs and tables properly labeled, constructed, and placed within your report?
- Do you refer to your graphs within the body of your memo?
- Do you follow the standard report format or a similar and equally effective format?
- Is your report presented in an aesthetically pleasing and professional manner? Where are some deficiencies

3. **Writing:**

- Do you use the active voice and strong sentences (as opposed to ambivalent statements) whenever possible? (For example, "We will **provide** a population projection analysis ..." sounds better than "This report **seeks to provide** a population projection analysis ...")
- Do you use simple, clear sentences without jargon or do you use awkward phrasings, unnecessary words, and highly technical terms?

4. **Professionalism:**

- This is based on my subjective opinion about how well you have successfully integrated the components listed above.
- Always proofread and spell-check your labs before handing them in. Spelling errors undermine the professional character of your report.
- Make sure your labs are legible. Either use a good quality ribbon or laser print your reports.

REFERENCES

The following books are excellent references for using visual displays to communicate information:

Tufte, Edward R. *Envisioning Information*. The Graphics Press: Cheshire, Connecticut, 1990.

Tufte, Edward R. *The Visual Display of Quantitative Information*. The Graphics Press, Cheshire, Connecticut, 1983.

