*Posted by   David Puglia  at Friday, July 28, 2017 10:10:01 PM*

To add more detail to my assignment, I sorted through many sample numeracy-infusion assignments posted on the Carleton. I eventually came across one that was aligned with my learning objectives. I modified my learning objectives slightly to meet the needs of the assignment, and I modified the assignment slightly to meet my own person taste. I think the result is an assignment that that is appropriate for an introductory writing class but also puts any emphasis on numerical literacy in the writing process.

**Numeracy-Infused Essay Writing for Introductory College Writing Students**

**Background:** Basic understanding of descriptive statistics and an ability to incorporate numbers, decimals, and percentages into writing.

**Goals:** The reason for the integration was to provide the students, who were mostly international students an essay topic that was applicable to their lives as they approve their writing. One of the goals is to encourage students to no longer accept statistical information without examination. Students will have the skills and vocabulary to be critical of statistics used in newspaper articles and other publications.

**Learning Objectives:**

1) Evaluate an author’s use of statistical reasoning in an argument as either appropriate or nefarious.

2) Interpret statistics in the development of a thesis statement.

3) Correctly and clearly write about numbers, percentages, and rates.

**Outline of Activities:**

1. Essay Assignment Sheet

2. Comment Sheet for Essay

3. Uses and Abuses of Statistics Handout

4. Homework on “Uses and Abuses” handout

5. Criteria for Analyzing Effective Use of Statistics Handout

6. In class Exercises on Statistics Skills and Concepts

7. Homework on Statistics Skills and Concepts

8. Pre-essay Homework assignment: Article and worksheet on “Premature Babies on Rise”

9. Pre-essay Homework assignment: Article and worksheet on “Life without Father”

10. Pre-essay Homework assignment: Article and worksheet on “Spend a Little, Save a Lot”

11. Pre-essay Homework assignment: Article and worksheet on “Study: Child-care draining families with low income”

12. Student Questionnaire and Comment form

**Essay Assignment Sheet**

**Deadlines:**Sunday, December 1, 2017 before midnight

**Length and Format:**This essay must be a minimum of four pages typed and double spaced in 12 point, Times New Roman font. The essay also needs to have a title.

**Instructions:**You will write a 5-paragraph cause/effect essay of 500-700 words. You will answer the following question: How can writers use math effectively to support their claims in articles and essays? In class, we will discuss criteria that writers should consider when using mathematical support. We also will be reading several articles and discussion how the writers follow or do not follow the criteria for effective use of statistics in their support. In your essay, you will need to refer to these specific articles as examples. Then your job will be to explain why the chose examples from these passages demonstrate effective and ineffective uses of math.

**Organization:**

You may use any of the four styles of introduction you learned. Your htesis should be the answer to the assignment question. I will show you some examlpes of how students have included a list style theses in response to this question.

Option I: In your body paragraphs, use several articles.

            Paragraph 1: Writers using mathematical support need to consider… (explain this

with an example from one of the articles read and discuss)

            Paragraph 2: Another concern when using math…(explain this with a second article

you read)

            Paragraph 3: A final consideration writers must make while using numerical

support…(explain this with a third article as an example)

Option II: In your body paragraphs use one article and rer to it for all of your examples.

Conclusion: Summarize your thesis/main point and conclude with a comment.

**Incorporating Examples from Articles:**

For each example you choose from the passage we read in class you should 1) provide a brief summary that includes some general context for the example, 2) analyze the way way math was employed, 3) explain how the example effectively or ineffectively illustrates the writer’s claim or argument.

You should choose examples that are effective as well as passages where the writer has been dishonest or ineffective. Using both will help the reader understand your points better than just positive examples or negative ones.

**Steps                                                                                                                Due Dates**

1. Study this assignment sheet.
2. Read article about the abuses of statistics.
3. Complete homework exercises.
4. Take notes on lecture. Criteria for good usage.
5. Small group work on identifying misuses of numbers.
6. Read article “Flu gets deadlier as nation gets older”
7. Do related homework exercises.
8. View students samples in class.
9. Read article “Life without Father.”
10. Do related homework and answer journal questions
11. Choose a brainstorming technique and choose three subtopics (specific criteria of good math usage)
12. Read article “Spend a Little, Save a lot”
13. Create a brief outline: thesis, topic, sentences, and supporting points.
14. Write thesis and two body paragraphs in class.
15. Receive feedback on first draft. Think about revision.
16. Conduct peer review with classmate using “Peer Editing Checklist.”
17. Complete final draft.

**Grade Sheet**

**1.    In-class exercises (attendance & participation)**

* a. Attendance on content days (15 pts.)

**2.    Homework Assignments**

**a.**Homework “Uses and Abuses of Statistics” (5 pts.)

**b.**Homework “Premature Babies on Rise” (5 pts)

**c.**Homework “Life without Father” (5 pts.)

**d.**Homework “Spend a Little, Save a Lot” (5 pts.)

**e.**Statistics Skills & Concepts worksheet (5 pts.)

**f.**Homework relate to Child Care article (30 pts.)

**3.    In class writing**

**a.**Thesis and 2 body paragraphs (10 pts.)

**4.    Final Draft of Essay**

**a.**Incorporation of require elements (10 pts.)

**b.**Correctness of analysis of statistics (20 pts.)

**c.**Clarity of analysis and explanation (20 pts.)

**Total (100 pts.)**

**Comment Sheet**

1. Essay Organization (did you use criteria appropriately; support and explain examples, and use examples appropriately) Comments:

2. Vocabulary/Language Use (did you use correct terminology and language and does your language fit the criteria used) Comments:

3. Addressing the Topic (did you understand the assignment and complete the assignment) Comments:

**Group Exercise for Statistical Analysis**

1. In an ABC “Nightline” poll, 186,000 viewers each paid 50 cents to call a “900” telephone number with their opinion about keeping the United National headquarters in the United States. The results showed that 67% of those who called were in favor of moving the United Nations headquarters out of the United States. Can we conclude the way general population feels about keeping the United Nations headquarters in the United States? Why or why not?

2. The *Newport Chronicle* claims that pregnant mothers can increase their chances of heaving healthy babies by eating lobsters. That claim is based on a study showing that babies born to lobster-eating mothers have fewer health problems than babies born to mothers who don’t eat lobster. What is wrong with the claim?

3. “According to a nationwide survey of 250 hiring professionals, scuffed shoes were the most common reason for male job seeker’s failure to make a good first impression. Newspapers carried this statement based on a poll commissioned by Kiwi Brands, producers of shoe polish. Comment on why the results of this survey might be questionable.

4. The Hawaii State Senate held hearings when it was considering a law require that motorcyclists wear helmets. Some motorcyclists testified that they had been in crashes which helmets would not have been helpful. What important group was not able to testify?

5. When it snowed heavily, Eric Meyer, a professional reporter, would call the sheriff’s office and ask how many “fender-benders” had been reported that day. Often the newspaper headline would say something like “A fierce winter storm…caused 28 fender benders on the freeways.” What additional information would help readers interpret that number? How might this ben an ineffective use of numbers?

**Homework on Uses and Abuses of Statistics**

1. Highlight all words or symbols related to math that are used in the examples in the passages.

2. What are the two different meanings of “figure” in the beginning of the quotation?

3. Why are “self-selected surveys” misleading?

4. Why was “the 67% of students suspended 3 times” a misleading percentage?

5. Why do you think that 97% of the respondents said “yes” to the first question about “Veto” power in contrast to the 57% of the respondents in the second question?

6. What might “100% improvement” mean to the airline that used this percentage? What did the editorialist believe that “100% improvement” means?

7. What did most consumers infer when they heard the claim “ninety percent of our cars sold in the last 10 years are still on the road”? How is the additional information that the car dealer sold 90% of his cars in the last 3 years different from the picture that the consumer’s had?

8. What example does RobertNiles.com give to demonstrate the need for readers to know where research data comes from?

9. What does correlation mean? What does causation mean? Create your own example of a correlation that does not mean causation.

**Criteria for Analyzing Effective Use of Statistics**

* The statistics/math should be clear.
* The numbers should be relevant. (It is not okay for a writer to throw out numbers just to be using numbers.)
* The statistics should be current (within the past 5-6 years) unless the writer is presenting a historical perspective.
* The statistics/numbers should be attributed. (Information about the source and date of numerical data should be identified in the text of the essay.)
* The math/statistics should be introduced. (The reader needs some context.)
* The statistics/math used should be explained (E.g., what math had to be performed to arrive at a certain number?)
* The statistics/math used should be interpreted. (What do the numbers mean? How do they relate to the essay’s thesis or claim?)

**In Class Exercise on Statistics Skills and Concepts**

1. In a study of members of a weight loss company, researchers found that 67% of the members lost 20 pounds or more. Furthermore, 30% of those members who had lost at least 20 pounds had maintained  that weight loss for five or more years. If there were 5,700 members in the study, how many actually maintained the weight loss of 20 pounds or more for five or more years?

2. A stockbroker who lets an account balance drop by 25% says to a client, “We’ll easily be able to make a 25% recovery in your account.” What is mathematically wrong with the stockbroker’s statement?

3. A research at a cancer research center was criticized for falsifying data. Among his data were figures obtained from six groups of mice, with 20 invdival mice in each group. These values were given for the percentage of successes in each group. 53%, 58%, 63%, 446%, 48%, 67%. What is mathematically wrong with his values?

4. Is a 10% price cut the same as two consecutive 5% cuts? Why or why not?

**Homework on Statistics Skills and Concepts**

1. In a study of college campus crimes committed by students high on alcohol and drugs, a mail survey of 1875 students was conducted. A *USA Today* article notes, “Eight percent of the students responding anonymous say they’ve committed a campus crime. And 62% of that group says they did so under the influence of alcohol or drugs.” Assuming that the number of students responding anonymously is 1875, how many actually committed a campus crime while under the influence of alcohol or drugs.

2. Suppose that *Show Warehouse*advertises that on this Saturday all their shoes will be an extra 10% off the sticker price. If a pair of shoes is already marked down 25%, will I get a totl of 35% off the pair of shoes? Explain your answer.

3. In an angry letter to the Associated Press, a company president complained about a poll being unfair. He claimed that because the sample size of 1,223 people was used to represented 120 million people, his letter represented 98,000 people who have the same views. Is this arithmetic correct? Is his claim valid?

4. A daily newspaper ran a survey by asking readers to call in their responses to this question: “Do you support the development of atomic weapons that could kill millions of innocent people?” It was reported that twenty readers responded, and 87% said “no” while 13% said “yes.” Based on the “Uses and Abuses of Statistics” article, what is wrong with the statement? What is wrong mathematically in this statement?

**Homework on “Premature Babies on Rise”**

1. In the seventh paragraph, the writers stats that it is “disturbing” that “nearly 12% of babies were born prematurely in 2001…” What if you were told that for the last 20 years, the percent of babies bing born prematurely was 11.4%? Would you agree that this rise to 12% is disturbing? Therefore, what other information could the writer have given to make it more clear that this “rise” is significant?

2. In the sixteenth paragraph, what information could the author have included to help us know whether the number of women who smoke is really that much different than ten yeas ago?

3. In the seventeenth paragraph, the author stats that “there were 45.8 births for every 1,000 women age 15 to 19.” Mathematically, what is another way to state this statistic?

4. In the fourteenth paragraph, the author writes, 83 percent of women got timely prenatal care, up from 76 percent in 1990.” Another way to state this fact is, “From 1990 to 2001, the percentage of women who received timely prenatal care increased by 7%.” Rewrite the second sentence ein the fourteenth paragraph in your own words.

**Homework on “Life without a Father”**

1. In the second paragraph, the author stats that “40 percent of US children will go to sleep in homes in which their fathers do not live.” How does he get this number from his chart? What assumptions is he making?

2. Also in the second paragraph, the author stats that “More than half of our children are likely to spend…” Does he get this number from the chart below? What important information is he not mentioning?

**Homework on “Spend a Little, Save a Lot”**

1. In the third paragraph, the author gives the annual cost of driving a car. She says that it does not include the cost of maintenance and insurance. Does she say what her estimated cost does include. Do you think this use of numbers (statistics) is clear? Why or why not?

2. In the seventh paragraph, does the author explain how she estimates that there would be five million cars and 27,000 new lane miles added to our highways? Does she site where the statistics came from? Is there information she should have included to make it more effective?

3. What kind of statistical evidence does she give to support he claim that “Another benefit of riding the bus is that it may help save your life or someone’s else’s life”? Describe it using your own words.

4. In the second paragraph, the author gives several statistics for reducing pollution. Are you impressed by her statistic that one person can save 9.1 pounds of hydrocarbons, 62.5 pounds of carbon monoxide, and 4.9 pounds of nitrogen oxide? What other information could she have included to make these numbers more effective?

**Homework on “Study: Child-care draining families with low income”**

1. According to the statistics in the article, how much money do families who can earn up to $33,059 spend on childcare? Show your work to find the answer. Then, write your answer in a complete sentence.

2. According to the statistics in the article, how much money do families who earn up to $16,529 spend on childcare? Show your work to find the answer. Then, write your answer in a complete sentence.

3. Do your answers from the first and second questions agree with the amounts given in the fifth paragraph?

4. What percent of low-income families receive help from the government with childcare expenses? Show your work to find the answer. Then, write yoru answer in a complete sentence.

**Student Questionnaire and Comments**

1. What’s your major?

2. Do you believe you understand issues related to use of statistics better now because you had to write an explanation? Why or why not?

3. Do you think that including a math related topic in your essay made it more or less difficult than other essay topics? Why or why not?

4. Please make suggestions in regard to improving this linked assignment for future students.