Visual Presentation of Data

2019-08-07

Course(s) Used:

- Public Speaking

Goals and Objectives:

- Students can identify the most common types of charts and graphs.
- Students can create effective charts and graphs.
- Students understand how to cite data in charts and graphs.
- Students can identify common errors in creating charts and graphs.
- Students know what to consider before using existing charts and graphs.

Rationale: Presenting numerical data, such as statistical evidence visually is one of the best uses of presentation aids. People can much more easily understand data when it is presented in a visual format rather than as a list of more abstract numbers.

Materials Needed

Materials:

- A computer with Internet access for demonstration
- A board and markers/chalk

Technology:

- At least one computer with Internet access per group

Outline of the Lesson

1. Review of previous session's content
2. Lesson opening
3. Common graphs and charts
    1. **Tables** list raw numerical data
    2. **Bar graphs** compare categories
    3. **Pictograms** use a series of images
    4. **Pie graphs** display portions of a whole
    5. **Line graphs** display changes over time

6. **Cartesian plots** show relationships between continuous variables
7. **Histograms** are simplified Cartesian plots displayed as a bar graph (without space)
8. **Timelines** display the temporal relationships of different events

4. Creating your own charts and graphs in PowerPoint
    1. Effects
    2. Attribution
5. Common student errors in creating charts and graphs
    1. Using tables
    2. Choosing the wrong type
    3. 3-D effects
    4. Shading
    5. Not using direct labels
    6. Unnecessary text (titles, scales, labels, keys)
    7. Using Infographics
    8. Relying solely on semantic color[1]
6. Hands-on group work
    - Students work in teams to locate create graphs and charts in PowerPoint. Students use US Mortality data located online from the CDC. Students should create 3 assertion-evidence structure slides which use graphs and charts based on these data as their visual evidence. There should be one slide which uses a bar graph or histogram, a second which uses a pie graph, and a third which uses a line graph. They use personal computers to create these presentation aids and share them with the class when complete. Questions groups should answer in front of the class include:
        - "What did you find most challenging about this project?"
        - "What aspect of these charts and graphs?"
        - "How would you cite these data?"
7. Using existing charts and graphs is like using images
    1. Resolution
    2. Aspect Ratio
    3. Backgrounds and Colors
    4. Licensing
    5. Effects
8. Oral presentation of numerical data
    1. Contextualize numbers for your audience
    2. Use round numbers unless precision is *required*
9. Lesson closing

[1] Approximately 1 in 20 people (1 in 12 males and 1 in 200 females) have some form of color vision deficiency.

Limitations

This lesson requires a classroom computer, a projector, and Internet access for demonstration. The students will need to bring their own computers if the class does not have access to a computer lab.

Variations and Accommodations

Follow guidance from local accommodation authorities. Students for whom technology usage will present an unreasonable burden be accommodated on an individual basis. Students may be placed in groups strategically if needed.