Incorporating Technology to Achieve Excellence in Data Visualization
Assessment Institute
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Session Learning Outcome 1
Session Learning Outcome 2

Overview

1. Growing Interest in Data Visualization
2. Principles and Processes for Data Visualization (Edward Tufte)
3. Technology Tools for Data Visualization
4. Collaborative Activities
1. Growing Interest in Data Visualization

Early Data Visualization

What is Data Visualization?

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<td>Medium</td>
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What is Data Visualization?

GLOBAL TEACHER SHORTAGE

- 2.7 million
- 0.2 million
- 0.8 million

Consequences
- Overcrowded classrooms
- Rising number of students per teacher
- Out of school
- 1.2 million
- 0.3 million

Quality teachers are the pillars of quality education, a human right.
What is Data Visualization?
Why Data Visualization?

http://projectassistant.org/branding/visual-graphic-design/

Uses of Data Visualization

http://www.itap.purdue.edu/learning/images/innovate/communicate.png

https://martygabler.files.wordpress.com/2012/06/gain-understanding-e1338642302334.jpg
Technology and Data Availability

Planning for Excellence in Data Visualization (Fry, 2008)
1. We Face Information Overload.
2. We Are Better at Data Collection.
3. We Need More Sophisticated Thinking About Data.
4. We Know Data Never Stay the Same.
5. We Must Remember the Reason for Data Collection.
6. We Must Draw Insights from Diverse Fields.
Fry’s Seven Stages of Data Visualization

1. Acquire
2. Parse
3. Filter
4. Mine
5. Represent
6. Refine
7. Interact

2. Principles and Processes for Data Visualization (Edward Tufte)
Who is Edward Tufte?

Tufte’s Principle of Graphical Integrity 1

http://www.politifact.com/truth-o-meter/statements/2015/oct/01/jason-chaffetz/chart-shown-planned-parenthood-hearing-misleading/
Would you buy this? Why?

Or Would You Buy This? Why?
Tufte’s Principle of Graphical Integrity 2

Grade Distribution

EDUC 1234 Grade Distribution
Fall 2015

Tufte’s Principle of Graphical Integrity 3

Enrollment 1981-2015

Enrollment 1981-2015
Tufte’s Principle of Graphical Integrity 4

Price of a Loaf of Bread
Current Dollars

Price of a Loaf of Bread
1970 Constant Dollars

Hypothetical
Teacher
Shortage in Millions

https://www.google.com/#q=cost+of+loaf+of+bread
http://www.thepeoplehistory.com/pricebasket.html
http://www.bls.gov/data/inflation_calculator.htm

Tufte’s Principle of Graphical Integrity 5
Tufte’s Principle of Graphical Integrity 6


3. Technology Tools for Data Visualization
Overview of Tools for Data Visualization

5 best practices for telling great stories with data and why it will make you a better analyst.

Excel

Grade Distribution

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SAS


STATA

http://www.stata.com/

http://www.esri.com/
William Jacoby’s Home Page

http://polisci.msu.edu/jacoby/

Coursera

https://www.coursera.org/course/datavizational
Collaborative Activity 1A

A newspaper runs the following headline: Family Income Increases Faster than Housing Cost. Below are two graphs that illustrate the claim made in the headline. Both graphs display the same information. Which one of the graphs best represents Tufte’s Principle 1 that the representation of numbers, as physically measured on the surface of the graph itself, should be directly proportional to the numerical quantities represented. Explain your answer.

Graph A

Graph B
Collaborative Activity 1B

The same newspaper uses the following graph to show housing cost as a percent of family income. What is wrong with the graph?

Collaborative Activity 1C

If there were any doubts about the newspaper needing a new graphic design editor, the following graph should remove all doubt. What advice would you give to the newspaper regarding the following graph?
Collaborative Activity 1D
The final newspaper graph adds insult to injury. What is wrong with the graph?

Collaborative Activity 2
Design a visual representation of the following data. Do not concentrate on artistic perfection, instead try to design a visual representation of the data that incorporates one or more of Tufte’s Principles. Explain your work and the principles you highlighted to the group.
Conclusion

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http://www.personal.psu.edu/users/n/y/nyl5096/Assignment206.html