Borrowing Across Disciplines for Integrated Curriculum Development

Lilly Conference on Evidence-Based Teaching & Learning
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What is Data Visualization?

Data Literacy

Visual Literacy

Graphic Design

M.G.Scanlon 2017
Why Use Data?

- Document a situation
- Demonstrate a trend
- Defend an assertion or argument
Example

The Hispanic population in Winston Salem has grown substantially since 1990.
Example

Since 1990, the Hispanic population in Winston Salem has grown over 2,000% from 1,521 to 38,218.
Example

According to the Census Bureau, the Hispanic population in Winston Salem grew from 1,521 to 38,218 between 1990 and 2017.

Source: Census.gov
Why Use Data Visualization?

• Data is ubiquitous and visualization helps us interpret it
Why Use Data Visualization?

90% of all information transmitted to our brains is visual. People remember...

80% of what they see

but only

20% of what they read.
Where to Use Data Visualizations

• Advocacy
• Research
• Performance review
• Financial analysis
• Competitive advantage when job-hunting
Skill Sets

• Visual literacy
• Data literacy
• Graphic design
Visual Literacy

• Perception
• Memory
• Patterns
Visual Literacy: Perception

• Pattern, size, color
• Words, numbers, concepts
• Data Visualization

Ted.com/talks/david_mccandless_the_beauty_of_data_visualization
Visual Literacy: Memory

See: 80%

Read: 20%
Visual Literacy: Patterns

- Trends
- Patterns
- Relationships
### Population of Winston Salem by Race and Ethnicity

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<tbody>
<tr>
<td>White</td>
<td>116,976</td>
<td>117,109</td>
<td>116,768</td>
<td>118,342</td>
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<td>Black</td>
<td>54,896</td>
<td>60,919</td>
<td>70,347</td>
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<tr>
<td>Hispanic</td>
<td>1,238</td>
<td>1,521</td>
<td>16,409</td>
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<tr>
<td>Asian</td>
<td>474</td>
<td>1,265</td>
<td>2,285</td>
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<td>Other Race</td>
<td>440</td>
<td>470</td>
<td>11,814</td>
<td>20,976</td>
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<td>American Indian and Alaska Native</td>
<td>336</td>
<td>392</td>
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<td>988</td>
<td>1,221</td>
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<td>Two or More Races</td>
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<td>5,553</td>
<td>8,113</td>
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Source: Census.gov
Population of Winston Salem by Race and Ethnicity

Source: Census.gov
Data Literacy

• Finding reliable sources of data
• Understanding basic statistical concepts
• Creating effective graphics
• Interpreting graphics
Data Literacy: Choosing the Right Type of Graph

Source: http://www.fusioncharts.com/charting-best-practices/selecting-the-right-chart/
Graphic Design

• Color
• Font
• Spacing
Audience Questions:

- Who’s using data visualization and how?
  - Teaching
  - Research
  - Assessment
  - Other
Why to Incorporate Data Visualization into a Class

Population: 1900 to 2016
In thousands, except as indicated. Estimates as of July 1. Prior to 1940, excludes Alaska and Hawaii. Civilian population excludes Armed Forces.

Year
Population (in thousands)
0 100,000 200,000 300,000 400,000

 Resident population

Our Classes

<table>
<thead>
<tr>
<th>LIS 650: Management Administration</th>
<th>LIB 290: Introduction to Data Visualization</th>
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Research Question

How would students respond to the same content taught in two different conditions?
Class Agenda & Materials

- Mary’s assigned reading:
  - “Chapter 14, Anatomy of a Graphic”
- Student-led discussion and ancillary material
- Mike’s assigned readings:
  - “10 Useful Ways to Visualize Your Data”
  - “Data Visualizations: A Tool for Advocacy”
- Mary’s lecture
- Graphing exercise
The Assignment

Create a graph in Excel
Rubric

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The Outcome: Total Scores

• UNC-G results

• WFU results
The Outcome: By Element

**UNC-G Results**
- **Citation**: 20
- **Axis labels**: 15
- **Good title**: 5
- **Title**: 20
- **Correct type**: 20

**WFU Results**
- **Citation**: 4
- **Axis labels**: 6
- **Good title**: 4
- **Title**: 8
- **Correct type**: 8
Process

• Course development should be ongoing
• Management classes should reflect workplace trends
• Recognize the value of content from other disciplines
• Experiment with content prior to broader use
• Pull in a subject matter specialist to assist
• Assess how content will be delivered and received
• Adjust as needed based on assessment
Next Steps

• Next semester, Mike will:
  • Include data visualization in his learning outcomes
  • Incorporate content earlier in the semester
  • Incorporate into additional assignments throughout the semester
  • Expand into data literacy – have students FIND data, and graph it.
Activity

• What are you currently teaching?
• What’s a concept from a discipline outside your own that you could draw into your class?
Resources

