

Borrowing Across Disciplines for Integrated Curriculum Development

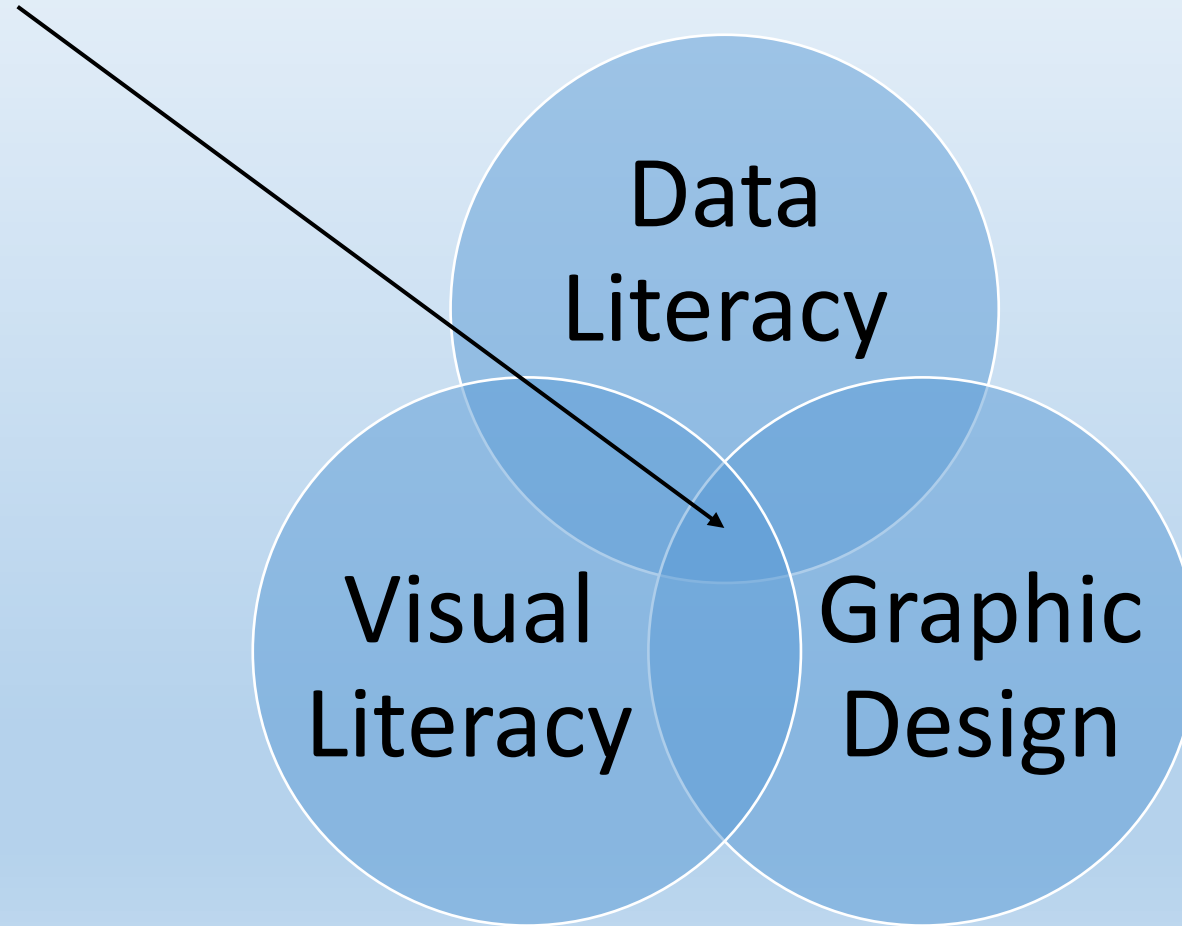
Lilly Conference on Evidence-Based Teaching & Learning

Michael A. Crumpton, UNC - Greensboro

Mary G. Scanlon, Wake Forest University

January 2018

What is Data Visualization?



Why Use Data?

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

Example

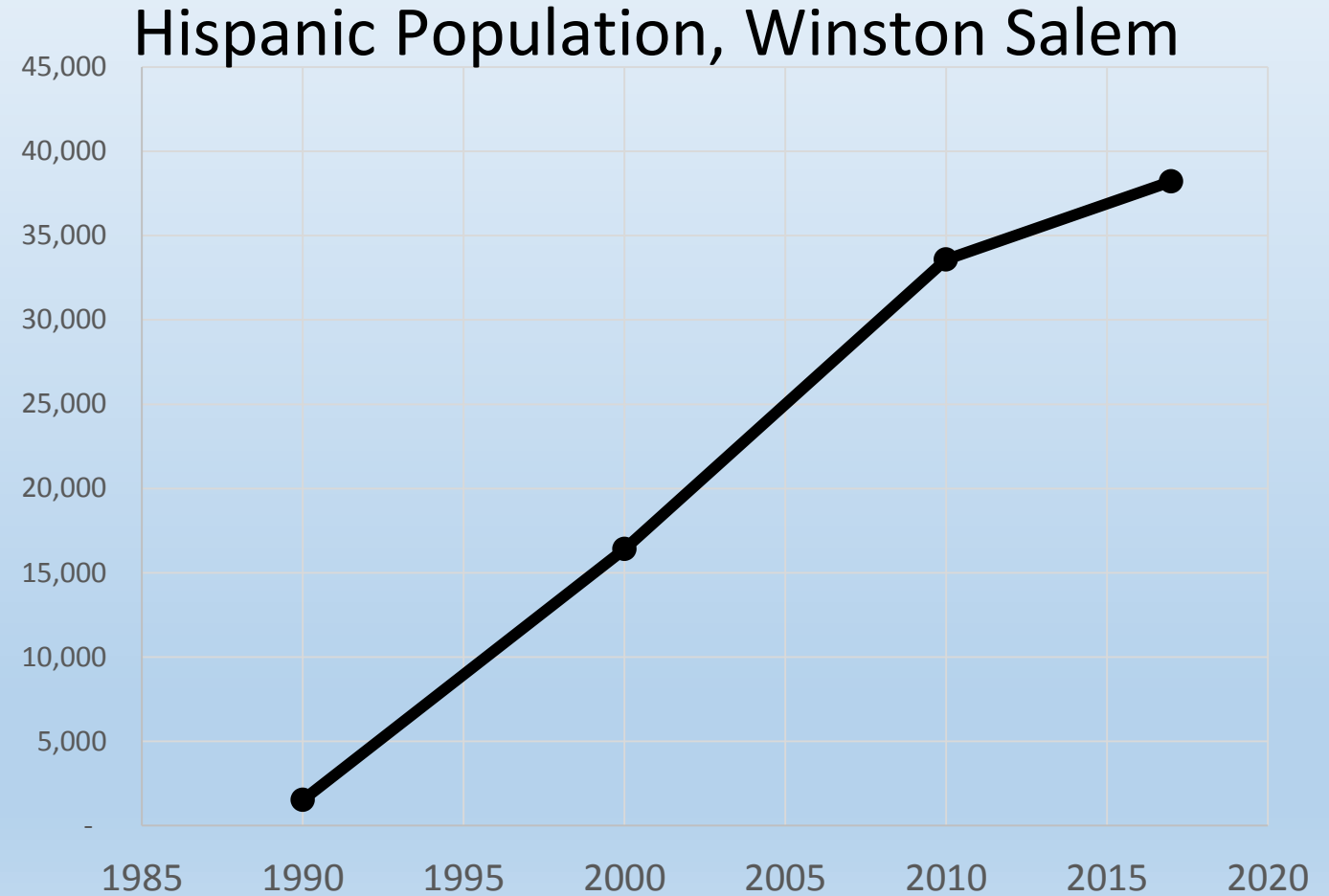
The Hispanic population in Winston Salem has grown substantially since 1990.

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...



but only



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](https://www.ted.com/talks/david_mccandless_the_beauty_of_data_visualization)

Visual Literacy: Memory

See: 80%

Read: 20%

Visual Literacy: Patterns

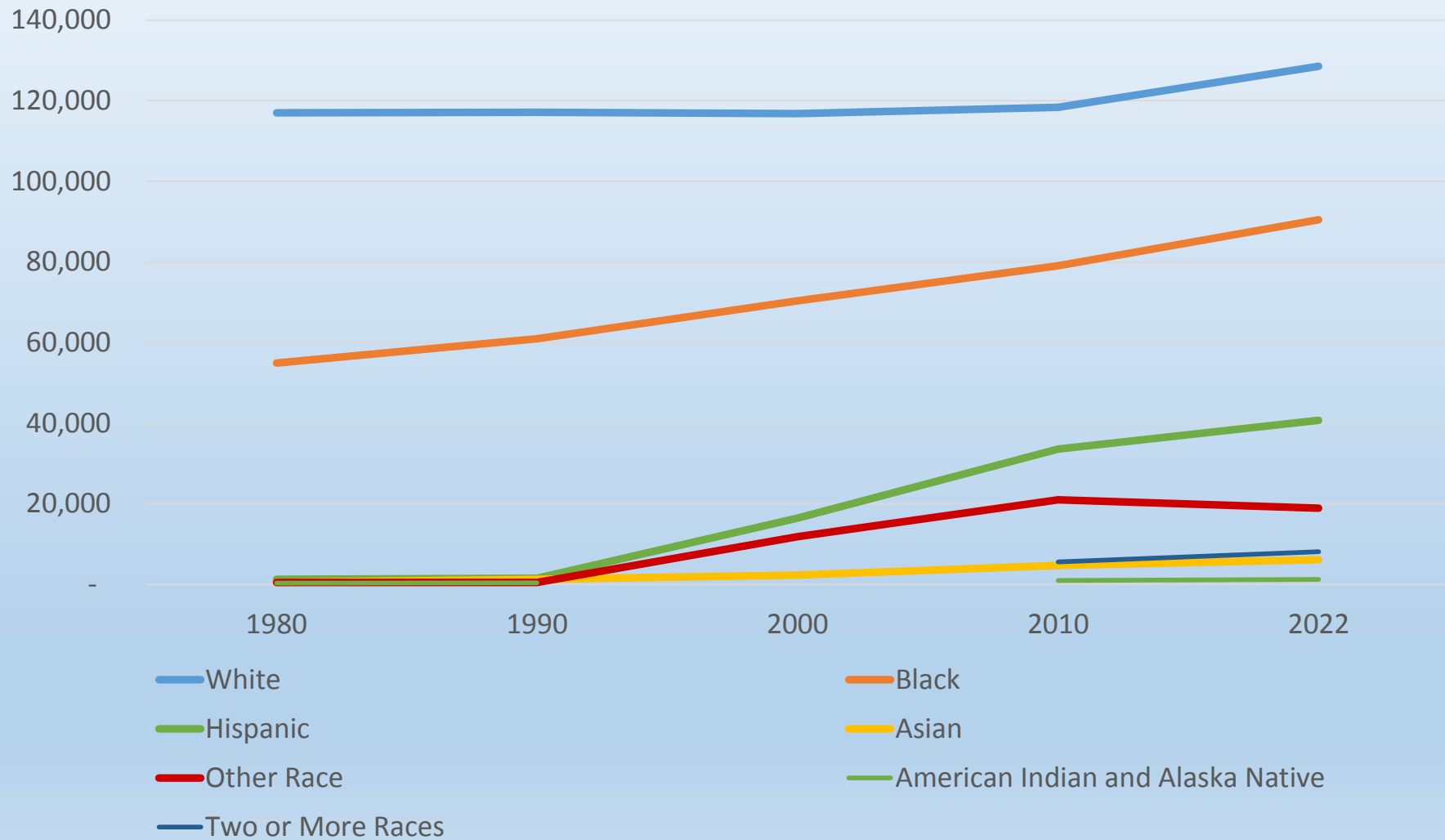
- Trends
- Patterns
- Relationships

Population of Winston Salem by Race and Ethnicity

	1980	1990	2000	2010	2022
White	116,976	117,109	116,768	118,342	128,545
Black	54,896	60,919	70,347	79,059	90,466
Hispanic	1,238	1,521	16,409	33,585	40,700
Asian	474	1,265	2,285	4,699	6,105
Other Race	440	470	11,814	20,976	18,917
American Indian and Alaska Native	336	392		988	1,221
Two or More Races				5,553	8,113

Source: Census.gov

Population of Winston Salem by Race and Ethnicity



Data Literacy

- Finding reliable sources of data
- Understanding basic statistical concepts
- Creating effective graphics
- Interpreting graphics

Data Literacy: Choosing the Right Type of Graph

COMMON FORMS OF DATA ANALYSIS

COMPARISON OF DATA

For identifying the highs and lows of data. Who is the best and worst sales guy among 10 individuals?



COLUMN CHART



BAR CHART

TRANSITION OF DATA

Applied to time-based data to understand the trend of change. Has the website traffic been going up or down over the last 30 days?



LINE CHART



AREA CHART

COMPOSITION OF DATA

To understand how a data value breaks down into its constituents. How does the website traffic break down into search, direct, referrals and campaigns?



PIE CHART



WATERFALL CHART

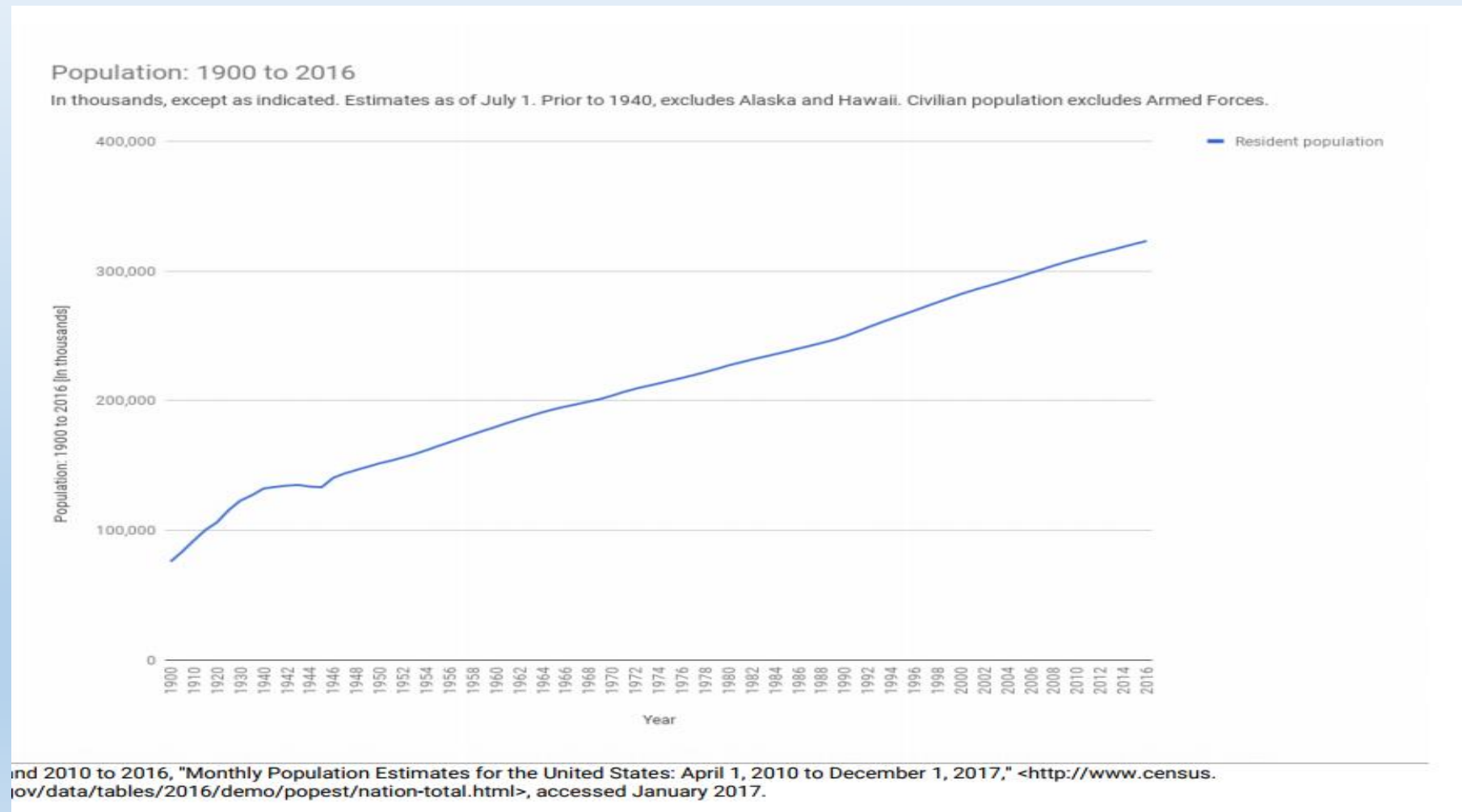
Graphic Design

- Color
- Font
- Spacing

Audience Questions:

- Who's using data visualization and how?
 - Teaching
 - Research
 - Assessment
 - Other

Why to Incorporate Data Visualization into a Class



Our Classes



THE UNIVERSITY *of* NORTH CAROLINA
GREENSBORO



WAKE FOREST
UNIVERSITY

LIS 650: Management Administration

LIB 290: Introduction to Data Visualization

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

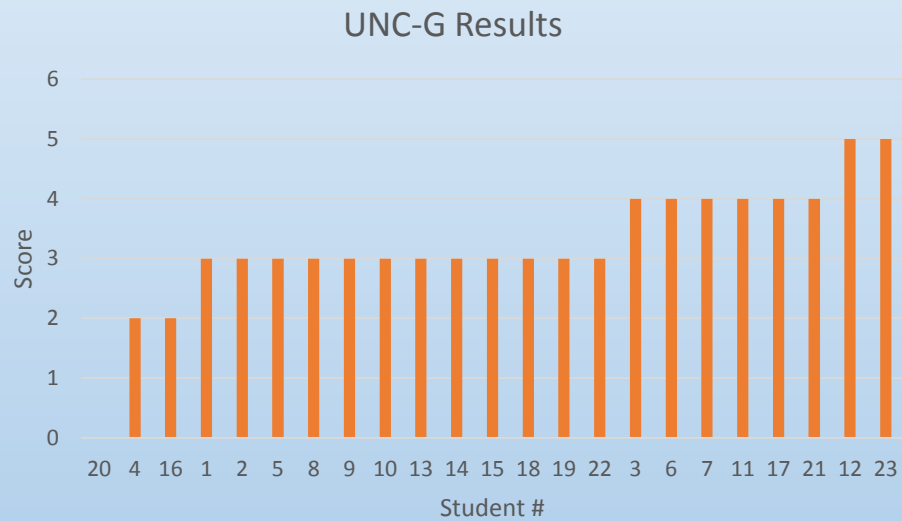
Create a graph in Excel

Rubric

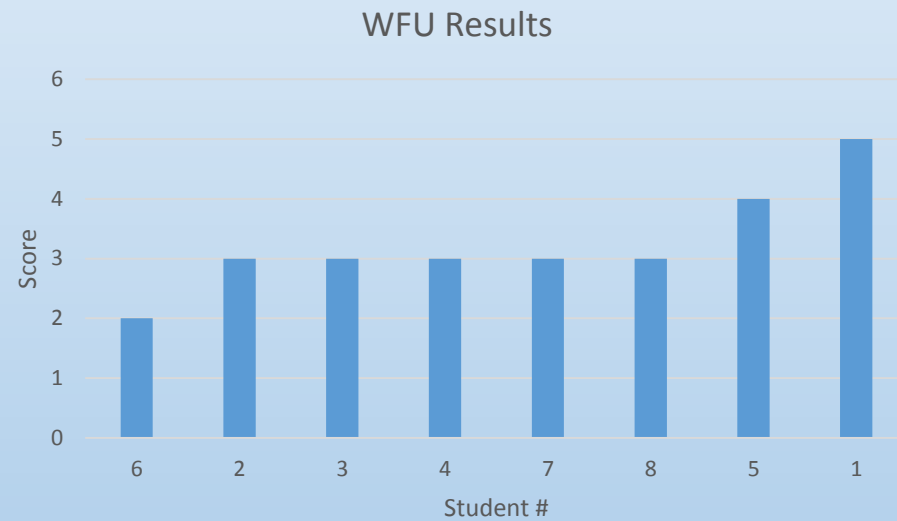
<u>Student</u>	<u>1</u>	<u>2</u>	<u>3</u>
Correct type (1)			
Title (1)			
Good title (1)			
Axis labels (1)			
Citation (1)			

The Outcome: Total Scores

- UNC-G results

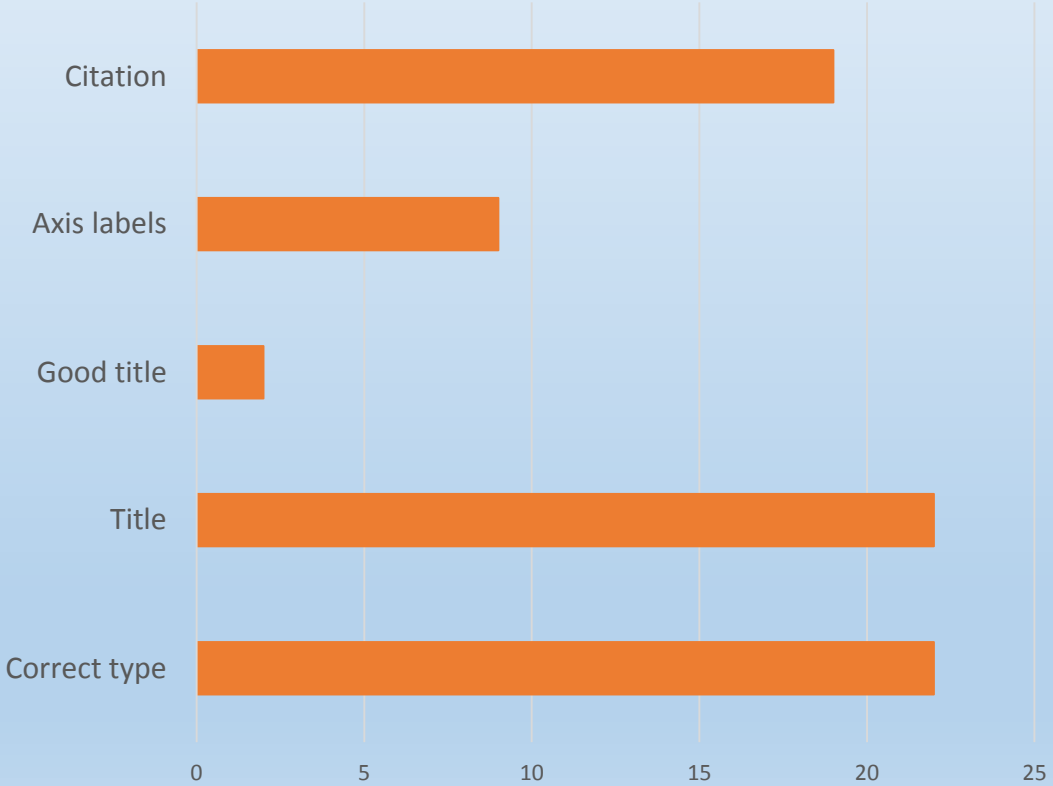


- WFU results

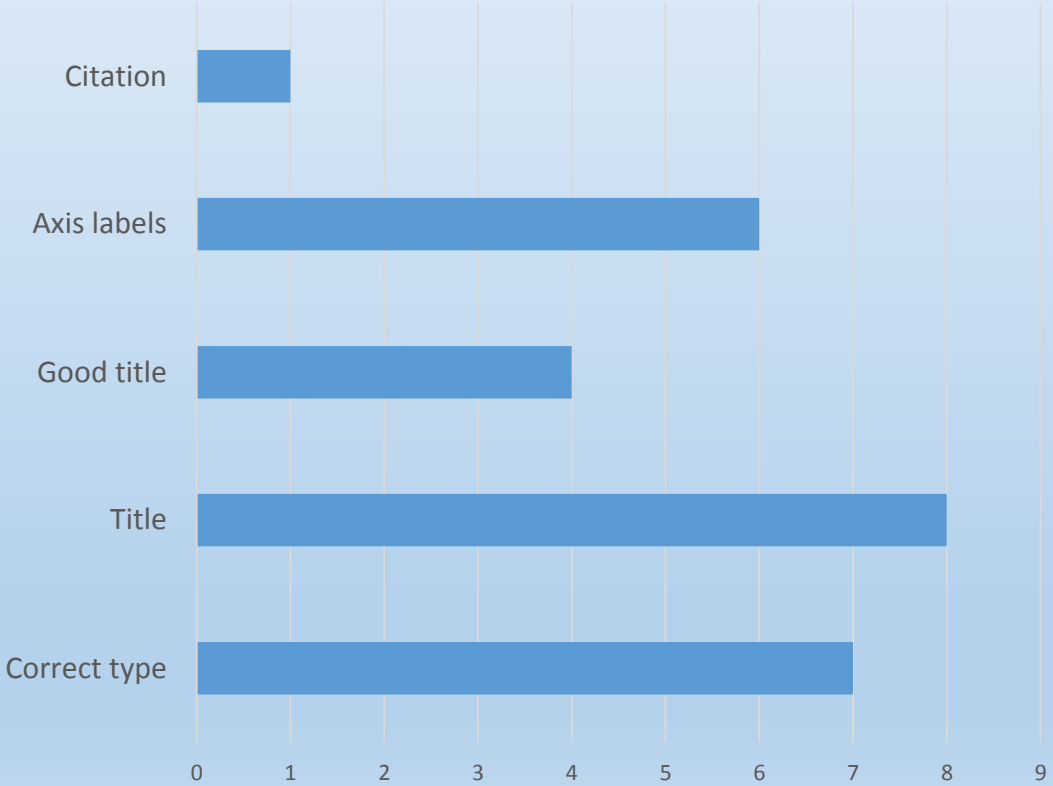


The Outcome: By Element

UNC-G Results



WFU Results



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

- Blitz, S. (2017, November 15). 10 Useful Ways to Visualize your Data. Retrieved from <https://www.sisense.com/blog/10-useful-ways-visualize-data-examples/>.
- Chiasson, T. (2017). Anatomy of a Graphic (Ed), DATA + DESIGN. Infoactive.
- Perez, J. (2016). Data Visualizations: A Tool for Advocacy. *Florida Libraries*, 59(1), 25–28.