Offering Infographic Short Courses to Meet Student’s Interest

Jane Zhao, Digital Media Commons (DMC), Fondren Library, Rice University
Some background information about offering infographic workshops
## Student survey, Spring 2015

### Undergraduate

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Objectives

1. Share our experiences of offering infographics/data visualization workshops

2. Share findings on tools and resources for creating infographics
Outline

1. DMC

   - Introduction to Infographics
     - Creating Charts with Excel and Google Chart
     - Poster Creation with InDesign
     - Poster Creation with PowerPoint

2. DMC & CWOVC

3. Future Work

   - Creating Digital Illustrations for Your Research
Objectives for “Infographics, Communicate Information with Graphics”

1. Develop staff expertise
2. Learn the best practices of information design
3. Be aware the handy tools for creating Infographics and Data Visualization
Outline

1. What is Infographic? What is Data Visualization?
2. Why Infographics work?
3. What makes a good Infographic?
4. Information design best practices.
5. Tools for creating Infographics and Data Visualization.
6. Data sources.
Books used
What is Infographic? What is Data Visualization?

DMC Equipment Circulation

- 2009
- 2011
- 2013
- 2015
Why Infographics work?

• Between 50-80% of the human brain is dedicated to visual processing.
• The human brain is a pattern recognition machine.
• People remember pictures better than words, especially over longer periods of time.
A Table of Data, Hard to See its Pattern and Trend.

<table>
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<tr>
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<th>2009</th>
<th>2011</th>
<th>2013</th>
<th>2015</th>
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<td>April</td>
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<td>310</td>
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<td>May</td>
<td>75</td>
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<td>139</td>
<td>214</td>
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<td>June</td>
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<td>127</td>
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<td>July</td>
<td>78</td>
<td>140</td>
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<td>August</td>
<td>60</td>
<td>170</td>
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<td>September</td>
<td>145</td>
<td>362</td>
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<td>October</td>
<td>175</td>
<td>312</td>
<td>348</td>
<td>404</td>
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<td>November</td>
<td>232</td>
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<td>December</td>
<td>114</td>
<td>157</td>
<td>249</td>
<td>324</td>
</tr>
</tbody>
</table>
Convert the Data to a Bar Chart, Easy to See the Pattern.

DMC Equipment Circulation Statistics
Convert the Data to a Line Chart, Easy to See the Trend.

DMC Equipment Circulation Statistics

- 2009
- 2011
- 2013
- 2015
What makes a good infographic?

Information Design Best Practices

• Focus on the key message and keep it simple
• Visualize when possible
• Use a simple text message combined with a relevant image
• Use color schemes that are color-blind friendly
Adjust hue or color brightness

to make color-bind friendly color schemes

[Diagram showing original image, color-blind proof, and optimized design]

Use Photoshop/Illustrator to Proof Colors
Choice of colors for color-blind readers - Tips from Edward Tufte website

Use Color Brewer as a Reference to Create Color-blind Friendly Color Scheme

http://colorbrewer2.org/ – Color Advice for Cartography
Will Excel’s built-in chart styles pass color-blind test?
Left: Excel chart style – 1st row 2nd one

Right: after turning on color-blindness tool in Photoshop
Left: Excel chart style – 3rd row 2nd one

Right: after turning on color-blindness tool in Photoshop
Left: Excel chart style – 4th row 3rd one

Right: after turning on color-blindness tool in Photoshop
It is safe to use Excel’s built-in chart styles to create color-blind friendly color schemes!
# Desktop Tools – Vector Graphics

<table>
<thead>
<tr>
<th></th>
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<th>Adobe Illustrator</th>
<th>Adobe InDesign</th>
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<tbody>
<tr>
<td>PowerPoint</td>
<td>Excel</td>
<td>OmniGraffle (Mac only)</td>
<td>InkScape (free, PC and Mac)</td>
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<tr>
<td>Gephi (free, PC and Mac)</td>
<td>OmniGraffle (Mac only)</td>
<td>InkScape (free, PC and Mac)</td>
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Note: Tools in orange shaded cells are supported at the DMC.
Desktop Tools – Image Editing

<table>
<thead>
<tr>
<th>Adobe Photoshop</th>
<th>Gimp (free, PC and Mac)</th>
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<tr>
<td><img src="image1.png" alt="Adobe Photoshop" /></td>
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<td>Pixelmator (Mac only)</td>
<td>Acorn (Mac only)</td>
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Online Tools

• Wordle.net  [http://www.wordle.net/](http://www.wordle.net/)
• Google Chart  [https://developers.google.com/chart/](https://developers.google.com/chart/)
• Tableau Public  [https://public.tableau.com/s](https://public.tableau.com/s)
### Online Infographics Resources

#### Periodic Table of Visualization Methods

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Visualization Type</th>
<th>Description</th>
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<tbody>
<tr>
<td>Data Visualization</td>
<td></td>
<td>Visual representations of quantitative data in schematic form (either with or without symbols).</td>
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<tr>
<td>Information Visualization</td>
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<td>The use of interactive visual representations of data to simplify cognition. This means that the data is transformed into an image, which is utilized to convey information. The image can be changed by users as they interact and work with it.</td>
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<tr>
<td>Concept Visualization</td>
<td></td>
<td>Methods to elaborate (mostly) qualitative concepts, ideas, plans, and analyses.</td>
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<tr>
<td>Compound Visualization</td>
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<td>The complementary use of different graphic representation formats in one single scheme or frame.</td>
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**Periodic Table Elements and Visualization Methods**

<table>
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<th>Element</th>
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*Note: Depending on your location and context.*

© Ralph Langner & Martin J. Epple, www
Online Infographics Resources

The Noun Project

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Online Infographics Resources

• Periodic Table of Visualization Methods
• The Noun Project
• 22 free tools for data visualization and analysis
• infographics world
More Sample Infographics

• Cool infographics
  http://www.coolinfographics.com/

• Edward Tufte
  http://www.edwardtufte.com/tufte/posters

• Information is beautiful
  http://www.informationisbeautiful.net/
  by David McCandless, an author and designer.
Data Sources

- data.gov
  http://www.data.gov/
- FactBrowser
  http://www.factbrowser.com/
- Google Public Data
  http://www.google.com/publicdata/directory
- Wolfram Alpha
  http://www.wolframalpha.com/
- Wikipedia
  https://en.wikipedia.org/wiki/Main_Page
On Campus Resources

• Data Visualization Center

• Kelly Center for Government Information, Data, and Geospatial Services

• GIS Data Center
Objectives for “Visualizing Small Data Sets with Excel and Google Chart”

1. Data visualization best practices.

2. Use Excel’s built-in color schemes.
   • How to pick up color-blind friendly color schemes.
   • How to proof color with Photoshop or Illustrator.

3. How to save the chart to the file format specified by the publisher such as PDF, EPS or TIFF.

4. Use Google Chart to embed an interactive chart into a webpage.
Two hands-on projects

• Creating a chart for publication
  example
  http://online.liebertpub.com/doi/full/10.1089/jpm.2015.0341

• Creating a chart to embed on a website
  example
  http://libguides.rice.edu/c.php?f23Fg=376896%26p=2603479
Objectives for “Creating a Poster with PowerPoint or InDesign”

1. Compare PowerPoint with InDesign
2. Learn the pros and cons of PowerPoint
3. Lean the pros and cons of InDesign
Our Mission

The DMC supports the creation and use of multimedia in education, scholarship, and creative expression. Working toward this end, we provide services that include hands-on training, assistance with digital projects, and access to the essential tools for creating digital resources such as digital video and audio, images and animations, infographics, PowerPoint presentations, web pages, and more.

DMC Offers Hands-on Training on Media Editing and Assistance with Various Digital Projects

1. Help with using DMC equipment
2. Demonstration of DMC equipment
3. Assistance on video/audio editing, and graphics creation
4. Consultation on patron’s project
5. Short courses for using digital tools

DMC Provides Access to the Essential Tools and Facilities for Creating Digital Media

1. Poster printing
2. Skyping/Podcasting
3. Equipment available for checking out
4. Lecture/interview recording
5. Photo taking
6. iMovie, Final Cut Pro, Photoshop, Illustrator, InDesign, and more

dmc.rice.edu | dmc-info@rice.edu | 713-348-3635
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By PowerPoint

Your Projects, Our Passion!

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Findings

**InDesign**
- Gets work done precisely and nicely
- Good at text wrapping
- There is a learning curve
- Not readily available

**PowerPoint**
- Get work done
- No text wrapping
- Little learning curve
- Almost everybody has it
Skateboards
Emma Satterfield & Elizabeth Myong
Rice University

How are skateboards significant in Rice culture?

Findings

- **Transportation**
  - Efficient and compact means to travel for crucial transition periods: meal and class times
  - Used on sidewalks, main roads, concrete, and brick pathways
  - Navigate to avoid barriers like gravel and grass
- **Personal Expression**
  - Decorations and type of skateboard: for example colored wheels, stickers, and elaborate designs
  - Specifically stickers conveyed owner’s interests and preferences
  - Identity as a type of person who rides a skateboard: counter-culture, modern, edgy
- **Social**
  - Traverse indoors and outdoor worlds seamlessly
  - Community among skateboarders
  - Leisure: freestyling, tricks, games, teaching others

Social History

- First a part of surfer culture but became identified with rebellion, punk movement
- As skateboarding gained popularity and publicity, its reputation has changed
  - Pro skateboarders like Tony Hawk and the development of ‘extreme sports’
- Still associated with individuality and nonconformity
- **Is this the case at Rice?**

Social Processes

- Manufacturing involves specialized factory labor to separately make the three main components
- Strong element of customer choice – they usually assemble the board, and often choose deck designs
- Companies like Made in Mars, DIYSkate emphasize direct involvement in the manufacturing process
- **Do skateboarders at Rice put their own skateboards together?**
  - Shows personal investment in the skateboard - assembly requires precision and effort
Apple EarPods: Manufactured Isolation

By: Allison Burns, Angie Iyinbor, & Sierra Jenkins

Rice University, Spring 2016

The History: Operators to Apple Inc.

- Apple first introduced its iconic white earbuds in 2001, at the turn of the 21st century.
- However, Apple did not pioneer the portable ear speakers. This was the work of Utah native Nathaniel Baldwin who worked upon the designs of the ten pound earpieces used by telephone operators in the 1880s and the electrophone system used by wealthy citizens to listen to the opera in the 1890s.
- By 1910, the Navy took notice and quickly adopted Baldwin’s newest model for use in their Radio Division.
- Almost 50 years later, John C. Koss created the first stereo headphones specifically designed for music. Their circumferential design engulfed the entire ear, canceling outside noise and making them ideal for listening to the latest Beethoven songs.
- Overtime, as portable music players evolved, so did headphones, until the earbud was introduced.
- In 2001, Apple grabbed hold of this emerging trend of small earbuds, making them into the most commonly used personal, portable speakers.
- Afterwards, a remote and mic was added to the right cord to allow users to pause, play, fast-forward, rewind, etc. and to make calls and use voice control while wearing the earbuds.

Isolation : Connection Paradox

Telephone Operators ➔ Wealthy Opera Lovers ➔ College Students

Forms, Materials, and Types: Improving on the Earbud

- Apple produces several different apparatuses for listening, commonly referred to as “headphones”.
- There are 2 general types of headphones: in-ear and over-the-ear.
- Apple EarPods are a type of in-ear headphones released in 2012 which are composed of: copper wire, white rubber coating, plastic outer shells, copper coils, and paper based speaker cones.
- EarPods differ from other in-ear headphones by the shape of the plastic earpieces – they are created to project sound toward the pinna of the ear, causing it to bounce back into the ear canal. Small grooves are carved into these plastic pieces, allowing air to pass through and improve the acoustics of the music played.

How it’s made: Production Foreshadows Consumer Use

- Apple EarPods are produced in factories in China, then shipped all over the world for sale.
- The production process is complex and involves:
  - Winding copper into spindles, forming the thin wire that conducts the signal inside the headphones.
  - Insulating and coating the wires with white rubber PVC to form the cables.
  - Crimping the headphone jack onto the end of the cable.
  - Assembling and inserting the speakers.
  - And testing the EarPods to ensure a full spectrum of relevant frequencies can be transmitted.
- Headphones are made using a semi-automatic production line – partially assembled by machines, and partially assembled by people.
- Interestingly, the environment in which headphones are made mirrors the environment they create. Employees in headphone factories work independently and quietly, not making eye contact or conversation with one another. The work requires focus and constant monitoring, and the employees do not have the luxury of interaction. Ironically, the very products they make end up facilitating barriers to social interaction in the lives of consumers.

In Practice: How Rice University Students Use Headphones

Where
- Headphones are used in both loud and quite, public and private areas
- Also, they are used in motion (walking outside, working out) more often with mobile devises and when stationary (studying in the library or Rec Center) more often on less-mobile devices such as laptops

How
- Headphones are used by students to isolate the wearer from the environment around him/her – EX: Studying in a loud coffee shop
- Similarly, the are used to isolate the environment from the individual students activity – EX: Watching a movie without disturbing one’s roommate
- However, headphones are also used to make virtual or long distance connections – EX: acquire the sensation of attending a concert that was given years in the past, talk to a boyfriend stationed overseas
- Also, headphones are used as a social place holder so that students wearing headphones are treated as though they are in a conversation – EX: Person takes one out or both headphones when “interrupted” by a friend talking to them
- Social interaction and headphone use do not generally occur simultaneously
- Headphones (with mics) are used to free hands for multitasking – EX: An individual typing on her laptop while talking on the phone

References:

- “A Poster Done in PowerPoint, ANTH 201, Spring 2016”
- “Apple EarPods: Manufactured Isolation” By: Allison Burns, Angie Iyinbor, & Sierra Jenkins
- Rice University, Spring 2016

Interdisciplinary Teaching in Statistics:
A History and Next Steps

Motivation
Statistics plays a key role in advancement of other disciplines. What have we done to incorporate this interdisciplinary aspect into our teaching?

Timeline
1839: American Statistical Association Founded
1911: First statistics Departments formed
1971: "...The object of the new course is not to teach statistics as a separate discipline with a well-defined area of study like physics, chemistry or biology, but to introduce it as a body of techniques for application in research problems of various disciplines-- C.R. Rao"

Quantitative Qualitative
Quantitative Approach
Leman et al. develop a framework which motivates statistical methods through examples, rather than the other way around

2015

2013

Rylands et al. study the collaboration between mathematicians and scientists to build quantitative skills in their students

1994

Modern Interdisciplinary University Statistics Education Symposium

Next Steps
• Widespread adoption of a QQQ – like approach
• Interdisciplinary statistics as a possible solution to computer science overlap
• Implement a organization-wide initiative for interdisciplinary focus
• Not just for statistics majors
Research Question
“What are the most effective ways to sustain students’ attention during lecture?”

My Approach
Drawing on attention studies from the scholarship on teaching and learning literature, psychology of attention, and philosophy of attention, I attempt to summarize what I have found to be the most salient features of attention for the classroom setting, say why I take these to be important for lecturing, and explain how we should think about implementing these findings.

A primary conclusion that has shaped my project is that the question of how to sustain attention during lecture is not independent of the more general question of how students’ attention is affected by their environment both inside and outside the classroom.

Decreasing “Distraction”
In my findings, the most effective factors pushing students toward optimal attention to lecture cluster around a few themes: familiarity with content (Concepcion, 2004, Thorne et al, 2005, Rudisill, 2011), breaks from lecture (Thorne et al, 2005; Davies 1983), and motivation/attitude towards content (Thorne et al, 2005; Yantis, 1993). Other factors like the professor's personality and the classroom environment are also said to be important, but I set these aside in this project because these elements are understudied in the literature, and are not issues for managing attention that are raised specifically by lecturing.

Conclusion: Pessimism
While we would like specific, effective practices for our own individual classrooms, student-dependent effects tend to block this route, leaving us with helpful but less effective general policies that can accommodate for the variation in the attentional patterns of students from classroom to classroom:

(1) student-independent effects: attention fluctuates in ways natural for everyone
(2) student-dependent effects: attention fluctuates in ways peculiar to each student

* (2) blocks many helpful policies!

(Partial) Bibliography
Thorne, G., Thomas, A., and Lawson, C. “15 Strategies for...”
Creating Graphics

Fading images to a solid color
Adding text to PDF/image files
PowerPoint Tips

• Pages can be up to 56” for either side.
• Built-in color schemes are very helpful and color-blind friendly.
• PowerPoint poster templates are available online or can be created easily.
• PowerPoint allows users to create floating text blocks, insert vector object shapes, and import images to arrange in an infographic design.
PowerPoint is indeed your friend!
A SHORT COURSE SERIES BY DMC AND CWOVC
Creating Digital Illustrations for Your Research

1. **Function** – presentation
2. **Design** – presentation
3. **Execution** – hands-on
4. **Style** – hands-on
Reflection and future Work

• How to effectively bring the workshops to the students?
• Just hands-on workshops?
• In addition to static infographics, cover motion infographics such as illustrative animations?
• A workshop on creative use of PowerPoint?
Takeaways

1. PowerPoint is a great vector based graphics tool for information design.

2. Excel is good for visualizing small sets of data for basic needs.

3. • Proof and pick up colors
   • Proof colors with Photoshop or Illustrator.
   • Getting tips on choosing color-blind friendly colors from Edward Tufte’s website.
   • The built-in color schemes of Excel and PowerPoint are color-blind friendly.
For more information

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https://wiki.rice.edu/confluence/display/DMCGUIDES/DMC+Guides+Home
References


