Designing a Poster
Tips and Tricks
An MSU Center for Faculty Excellence
Teaching and Learning Workshop
Presented by
Steve Luft
Center for Faculty Excellence
Graduate Student
October 27, 2016
• Sign up sheet – populates your faculty insight report
• Credit towards membership in the Center for Faculty Excellence - 8 credits required for membership – members invited to end of the year celebration.
• Credit towards Teaching Enhancement Certificate – 12 credits required – multiple ways to earn credits – short workshops 1 credit/unit
• Evaluations
Agenda

What is a Poster
Purpose of a Poster
Poster Types
Design
Examples
What is a poster?

A poster is a “public” piece of paper conveying information through text (words) and/or graphic images (symbols or pictures).

Purpose of a Poster

Poster must convey its message with immediacy and purpose.

- Research conducted looking at the amount of time people spend looking at a poster - Average time looking at a poster? 90 seconds.

Main target audience is the person walking by. Designed to be displayed vertically on a wall or in a window, and is large enough to be seen and read from a relatively short distance (5’-10’).

Communication is **KEY**
Poster Types

Research & Informational
Study of E. coli in Silver Bow Creek
Rachael Woodschmidt III
Montana Tech
April 25, 2001

Abstract:
This study was done on the E. coli levels that are present in Silver Bow Creek and what contributes to these levels. The area was studied from the waste treatment plant in Rosier, Montana. These levels are of interest due to the fact that a walking trail is being built through this area. This will allow children, adults, as well as pets to be exposed to the treat of E. coli. Samples of water were collected from a number of location along this site. The samples were then filtered and allowed to grow on mEndo agar so that the number of E. coli colonies could be counted. Due to faulty equipment a conclusive decision on the reason for the colony formations was not drawn.

Introduction
Location
Silver Bow Creek
Procedure

• Silver Bow Creek
• Size of bacteria:
  measurement

• Procedure involves:
  - filtering
  - incubation

Discussion:
The results that were collected were the values for the number of E. coli, pH, and dissolved oxygen. The number of E. coli that were found in 10 mL of sampled water were much higher than the recommended level for drinking water. The pH levels that were recorded throughout the sample were around neutral which is what was expected. The dissolved oxygen levels that were found were much higher than would be expected. This may be due to an error in the sampling method that was used or due to faulty equipment. The nitrates levels in the water could not be tested due to the fact that the test kit for nitrates was not in working order. The levels of nitrates may have provided some reasons why the numbers of E. coli were so high, since E. coli are nitrate loving bacteria.

Collection of Samples
Millipore Membrane Filter Apparatus

Problems

Conclusion

Results

Results Cont.
Hantavirus Pulmonary Syndrome

By Zara Berg

- **Hantavirus (HPS):** a disease that causes respiratory failure & discovered in 1993

- **Contracted:** rodents shed the virus in their urine, droppings, and saliva. The virus is mainly transmitted to people when they breathe in air contaminated with the virus. Contamination usually found in rural areas inhabited by rodents.

- **Symptoms:**
  - Unusual symptoms: soar throat, rash, earache and runny nose
  - **Treatment:** The earlier the patient is brought in to intensive care, the better. If a patient is experiencing full distress, it is less likely the treatment will be effective.
  - **Prevention:** Seal up holes and gaps in your home or garage. Place traps in and around your home & clean up any easy-to-get food.

- **Types of Rodents that spread the disease:**
  - Deer Mouse: Found throughout North America
  - Cotton Rat: Found in overgrown areas with shrubs and small grasses
  - Rice Rat: Found in marshy areas & is semiaquatic
  - White-Footed Mouse – Found in woody & brushy areas
1. Introduction
In Florida, the population of West Indian Manatees, listed as endangered species in 1987, appear to be growing in recent years. At the same time, the total number of manatee deaths is increasing rapidly. Therefore, it has become more important to evaluate the long-term viability of the populations. I hypothesized that cold stress due to cold winters and accidents with watercrafts cause additional mortality and examined the population trends during the next 100 years.

2. Objectives
- Simulate manatee population trends during the next 100 years under the assumptions that there is additional mortality due to cold stress only (temperature effect) or accidents with watercrafts only (boat effect) or both cold stress and accidents (combined effect).
- Investigate the relationship between the mean number of deaths due to watercraft accidents in each year and the probability of extinction within the next 100 years.

3. Methods
- Model type: modified age-based matrix model of female manatees
- Initial population size = 1600
- Mean boat collision deaths / year = 68 individuals
- Draw minimum temperature and the number of boat collision deaths in each year randomly from normal distribution
- Simulate 100 times for each model

4. Results: Graphs of Population Trends
- Model 1: No effect (natural mortality only)
  - Natural Mortality Only
  - Without additional mortality, the manatee population keeps growing

- Model 2: Temperature effect
  - Even 100 years of consecutive cold winters do not cause the manatee population to decline

- Model 3: Boat effect
  - A mean of 68 boat collision deaths / year causes slower population growth, but the population size still increases

- Model 4: Combined effect
  - Assuming randomly occurring cold winters and a mean of 68 boat collision deaths / year, population growth became even slower, but the population size still increases
  - BUT........
  - If the mean number of boat collision deaths / year becomes 72, there is a chance that the population will become extinct

5. Discussion
- Cold winters did not cause the manatee population to decline. This result can be expected because there are thermal refuges during winter (e.g., power plant warm-water discharges), therefore, the mortality due to cold winters was very low. Developing a model that includes the effect of winter refuge loss could be interesting in future studies.
- Current average boat collision deaths (i.e., 68 deaths / year) slowed population growth; however, did not cause the manatee population to decline.
- Population growth became even slower when the effects were combined (i.e., randomly occurring cold winters and mean boat collision deaths / year = 68); however, the population was still growing.
- Increase in the mean boat collision deaths (even by a small number) could be a serious problem. For a mean >= 78, the extinction probability became 1. The records show that the deaths due to accidents increased rapidly during the last 5 years, therefore understanding the current situation of boat collision deaths is important to maintain manatee populations.
Southern Flounder Exhibit Temperature-Dependent Sex Determination

J. Adam Luckenbach*, John Godwin and Russell Borski
Department of Zoology, Box 7617, North Carolina State University, Raleigh, NC 27695

Introduction
Southern Flounder (Paralichthys lethostigmus) support valuable fisheries and show great promise for aquaculture. Female flounder are known to grow faster and reach larger adult sizes than males. Therefore, information on sex determination that might increase the ratio of female flounder is important for aquaculture.

Objective
This study was conducted to determine whether southern flounder exhibit temperature-dependent sex determination (TSD), and if growth is affected by rearing temperature.

Methods
- Southern flounder broodstock were strip spawned to collect eggs and sperm for in vitro fertilization.
- Hatched larvae were weaned from a natural diet (Artemia) to high protein pellet diet after satiation at least twice daily.
- Upon reaching a mean total length of 40 mm, the juvenile flounder were stocked at equal denisties into one of three temperatures 18, 23, or 28°C for 245 days.
- Gonads were preserved and later sectioned at 2-6 microns.
- Sex-distinguishing markers were used to distinguish males (spermatogenesis) from females (oogenesis).

Histological Analysis

<table>
<thead>
<tr>
<th>Male Differentiation</th>
<th>Female Differentiation</th>
</tr>
</thead>
</table>

Temperature Affects Sex Determination

<table>
<thead>
<tr>
<th>Temperature (°C)</th>
<th>% Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>10</td>
</tr>
<tr>
<td>23</td>
<td>30</td>
</tr>
<tr>
<td>28</td>
<td>50</td>
</tr>
</tbody>
</table>

(RP = 0.05 and RRP = 0.001 represent significant deviations from a 1:1 male female sex ratio)

Rearing Temperature Affects Growth

<table>
<thead>
<tr>
<th>Temperature (°C)</th>
<th>Body Weight (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>80</td>
</tr>
<tr>
<td>23</td>
<td>40</td>
</tr>
<tr>
<td>28</td>
<td>20</td>
</tr>
</tbody>
</table>

Growth Does Not Differ by Sex

<table>
<thead>
<tr>
<th>Temperature (°C)</th>
<th>Male (g)</th>
<th>Female (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>23</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>28</td>
<td>20</td>
<td>20</td>
</tr>
</tbody>
</table>

Results
- Sex was discernible in most fish greater than 120 mm long.
- High (28°C) temperature produced 4% females.
- Low (18°C) temperature produced 22% females.
- Mid-range (23°C) temperature produced 44% females.
- Fish raised at high or low temperatures showed reduced growth compared to those at the mid-range temperature.
- Up to 245 days, no differences in growth existed between sexes.

Conclusions
- These findings indicate that sex determination in southern flounder is temperature-sensitive and temperature has a profound effect on growth.
- A mid-range rearing temperature (23°C) appears to maximize the number of females and promote better growth in young southern flounder.
- Although adult females are known to grow larger than males, no difference in growth between sexes occurred in age-0 (< 1 year) southern flounder.

Acknowledgements
The authors acknowledge the Subcommital-Kennedy Program of the National Marine Fisheries Service and the University of North Carolina Sea Grant College Program for funding this research. Special thanks to Leo Ware and Beth Stamps for help with the work.
Southern Flounder Exhibit Temperature-Dependent Sex Determination

J. Adam Luckenbach*, John Coadly and Russell Brown
Department of Zoology, Box 7662, North Carolina State University, Raleigh, NC 27695

Introduction
Southern flounders (Platichthys flesus) exhibit temperature-dependent sex determination (TSD), and if growth is affected by rearing temperature.

Objective
This study was conducted to determine whether Southern flounder exhibit temperature-dependent sex determination (TSD), and if growth is affected by rearing temperature.

Methods
- Southern flounders were reared in 28°C and 20°C water for 16 weeks. Only three temperature treatments were used: 18°C, 23°C, or 28°C for 254 days.
- Gonads were preserved and later sectioned at 2-μm sections.
- Sex distinguishing markers were used to distinguish males (Drosophila) from females (Drosophila).

Histological Analysis

Context
This poster was presented at the annual Zoology Department Symposium for graduate students at North Carolina State University. It won the award for best poster presentation at the symposium.

Positive Points
- The title conveys the main message instantly.
- Context and objectives are made clear.
- Methods are concise.
- Graphs are interpreted by their titles. One can read the titles and trust the authors, or examine the graphs in more detail.
- Results and conclusions are concise and relate back to objectives.
- Color scheme is very simple and pleasing.
- Font is large enough everywhere, including figures.

Negative Points
- Results and conclusions do not relate back to context (Introduction). It would be nice to see a statement of how the findings relate to aquaculture.
- Some viewers have noted that the title could be more direct: "Water Temperature Determines Sex of Southern Flounder"
- Title font is too small on the slide - could be larger.
- Some viewers have felt there is too much white space between the columns. It could be reduced somewhat, but not too much. Doing so would also allow facts to be made a little larger.
Can Suburban Greenways Provide High Quality Bird Habitat?

George R. Hess :: NC State University :: Department of Forestry & Environmental Resources :: Raleigh NC 27695-8002 USA :: george_hess@ncsu.edu
Christopher E. Moorman, Jamie H. Mason, Kristen E. Sinclair, Salina K. Kohut :: NC State University :: Department of Forestry & Environmental Resources
www4.ncsu.edu/~grhess/GreenwaysForWildlife

Birds of Conservation Concern in Decline
- Many bird species of conservation concern – including neotropical migrants, insectivores, and forest-interior specialists – decline with increasing human development
- Greenways might mitigate this effect
- Habitat patch size, vegetation composition & structure, and landscape context are key factors
- Standards are lacking for designing and managing suburban greenways as high quality habitat

Objective: Greenways for the Birds
- Determine how development-sensitive forest birds are affected by
  - forested corridor width
  - adjacent development intensity
  - vegetation composition & structure
- Develop recommendations for greenway designers and planners

Study Design & Independent Variables
- Sampled 34 - 300m corridors in Raleigh & Cary, NC, USA
- Sampled range of
  - 20 - 1,200m
  - Adjacent density (low density residential – office/commercial)
- Additional measures
  - Vegetation composition & structure in corridor
  - Land cover in 300m x 300m adjacent to corridor (context)
- Measured richness & abundance of
  - Breeding birds
  - Neotropical migrant birds during stopovers
  - Mammal nest predators

Breeding Birds of Concern More Common in Wider Greenways with Less Managed Area Surrounded by More Forest Canopy
- 8-minute, 50m point counts at center of corridor
- Revisited 4 times during breeding season
- Forested Interior Species Richness
- Neotropical Migrant Species Richness

Nest Predators Less Common in Wider Greenways with Narrower Paths
- Five baited scent stations along each greenway segment
- Observed for 5 nights each
- Significant Predictors for Predator Abundance
  - Greenway:
    - Corridor width
    - Building density
  - Adjacent Landscape:
    - Corridor width
    - Mature forest
    - Ground cover
    - Vine cover

Greenways for Development-Sensitive Forest Birds Might Conflict with Intense Recreational Use
- People & Managers Prefer ...
- Forest Birds Prefer ...

Spring Neotropical Migrant Stopovers More Common in Wider Greenways with More, Taller Hardwood Trees
- 200m x 25m transects along one side of greenway path
- Revisited sites for two spring seasons and one fall season
- Width not significant, but trend consistent with other findings

Potential Solution: Wide Corridor, Trail Near Edge
- Make corridors at least 50m wide; wider is better
- Don’t split forested corridor
- Keep trails as narrow as possible
- Avoid wide grassy areas along trails within forested corridor
- Locate trails near the edge of forested corridors
Can Suburban Greenways Provide High Quality Bird Habitat?

Objective: Greenways for the Birds
- Determine how development-sensitive forest birds are affected by
  - forested corridor width
  - adjacent development intensity
  - vegetation composition & structure
- Develop recommendations for greeway designers and planners

Study Design & Independent Variables
- Sampled 34 - 390 ha corridors in Raleigh & Cary, NC, USA
- Sampled range of:
  - Forested corridor widths (28 - 1,280)
  - Adjacent density (low density residential - low-intensity)
- Additional measures:
  - Vegetation composition & structure in corridor
  - Land cover in 30 m x 30 m adjacent to corridor center

Context
This poster was presented at the annual meeting of the Ecological Society of America (2005).

Positive Points
- The title asks an interesting question.
- The headings (white text on blue background) provide a brief description of the poster. If you read only the headings, you can get a good idea of what this work is about. But see Negative Points.
- Methods are concise.
- The poster is quite visual - nice images.
- Results and conclusions are concise and relate back to objectives.
- Color scheme is very simple and pleasing.
- Font is generally large enough (too small in figures).

Negative Points
- Some viewers have felt the poster appears crowded - there is not a lot of white space.
- Some viewers dislike the heading blocks because (1) they were not helpful in providing direction about what was in each section, (2) some - especially those in the middle column - are too long, and (3) they were not helpful in directing the viewer where to read for what information.
- The graphs - especially the four scatter plots - are too small and have fonts that are too small.
Gene Flow in Lions

Introduction
- One of the greatest dangers to small populations is related to gene flow
- Deliberate alleles can crop up and spread throughout a small population, pushing the population towards extinction
- It may be possible, as conservationists, to use gene flow in small populations to our advantage, by introducing beneficial alleles into a small population, perhaps by transplanting animals with desired traits
- In either case, it is essential to know how fast the new gene, whether beneficial or detrimental, will affect the population
- Because of their unusual social structure and endangered species status, lions present an interesting and informative model of gene flow in small populations

Objectives
- Determine what kinds of detrimental genes are likely to threaten a small population
- Predict the speed with which a beneficial gene will spread throughout the population

Methods
- I developed a stochastic model that followed the fate of lion prides, month by month, over a period of 50 years
- I modeled nine different effects of genetics on survival:
  - Gene Effect 1 - Control
    - Initial population - random, about 60% heterozygous
    - Effect on survival - none
  - Gene Effect 2 - Harmful recessive gene
    - Initial population - RR with one Rr adult female
    - Effect on survival - $\sim 10\%$
  - Gene Effect 3 - Beneficial recessive gene
    - Initial population - RR with one rr adult female
    - Effect on survival - $\sim 10\%$
  - Gene Effect 4 - Harmful dominant gene
    - Initial population - RR with one Rr adult female
    - Effect on survival - $\sim 10\%$
  - Gene Effect 5 - Beneficial dominant gene
    - Initial population - RR with one RR adult female
    - Effect - $\sim 10\%$
  - Gene Effect 6 - Very harmful recessive gene
    - Initial population - RR with one Rr adult female
    - Effect on survival - $\sim 50\%$
  - Gene Effect 7 - Very beneficial recessive gene
    - Initial population - RR with one rr adult female
    - Effect on survival - $\sim 50\%$
  - Gene Effect 8 - Very harmful dominant gene
    - Initial population - RR with one Rr adult female
    - Effect on survival - $\sim 50\%$
  - Gene Effect 9 - Very beneficial dominant gene
    - Initial population - RR with one RR adult female
    - Effect on survival - $\sim 50\%$

Results
- Recessive genes had little effect, no matter how beneficial or detrimental
- Harmful dominant genes quickly eradicated themselves, and had little effect on the resulting population size
- Introductions of beneficial dominant genes resulted in small, quick increases in the prevalence of the beneficial allele, followed by a slower decrease
- Gene effect 5, the very beneficial dominant gene, was the only effect I modeled that had any real positive effect on the final population size.

Discussion
- If we are to attempt to use relocation as a way to 'breathe up' the genetics of small populations of lions, we must try to make sure the gene we wish to introduce is a dominant one. Also, relocating just one animal is unlikely to be enough to spread the gene in a reasonable amount of time. My model could easily be modified to simulate the introduction of multiple animals.
- Spontaneous mutations are unlikely to be a problem in lion populations; recessive genes do not have a large enough effect to be dangerous, at least in the relatively short term of 60 years, and dominant genes eradicate themselves quickly.
Gene Flow in Lions

Introduction
- Gene flow occurs when individuals move from one population to another.
- Genes can move into and out of populations, affecting population structure and evolution.
- The study of gene flow is crucial for understanding population dynamics and evolutionary processes.

Objective
- To determine which traits of different gene pools are stable, and which are not.
- To study the impact of gene flow on population stability.

Methods
- A model was developed to simulate gene flow in lion populations over a period of 100 years.
- The model considered factors such as migration rates, mating preferences, and genetic drift.
- Results were analyzed to understand the effects of gene flow on population structure.

Results
- Gene flow led to increased genetic diversity within populations.
- Migration rates had a significant impact on population structure.
- High migration rates resulted in increased genetic homogeneity across populations.

Discussion
- The study highlights the importance of gene flow in maintaining population stability.
- Management strategies should consider the role of gene flow in conserving lion populations.

Context
This poster was presented as a class project for Modeling Biological Systems at NC State University.

Positive Points
- Nice, attention-grabbing graphic (the lion).
- Large title.
- Font is easy to read, even in figures.
- Headings everyone will understand – clear organization.
- Author identified with complete contact information (lower left corner).

Negative Points
- Poster seems a bit text heavy and unbalanced (all figures in upper right).
- Hand to head ratio over the lion graphic - lack of contrast, changing contrast, confusing lines.
- Title is not very informative.
- Titles on graphics are not very informative ("Gene Effect 1", "Gene Effect 2", ...) could have named the effects and listed them as titles.
- Lots of back-and-forth required between text and graphics – could have spread out the graphics and put the pertinent text near each graph.
- In addition to the "Discussion", some kind of "Lessons Learned" section might help put the work in perspective – especially for the uninitiated.
- It's not clear what the "spot art" in the lower right is supposed to represent. If it's gene flow, perhaps it would have worked better up with the title.
- Although author is identified fully (lower left), at least her name should have appeared more prominently under the title.
ABSTRACT
Click here to insert your Abstract text. Type it in or copy and paste from your Word document or other source here. This text box will automatically re-size to your text.
To change the border style of this text box, double-click on the dashed border, select “Colors and Lines”, and change the border to solid or whatever style/color you like. Or “No Line” to remove the border altogether.
To change the font style of this text box, click on the border once to highlight the entire text box, then select a different font or font size that suits you. This text is in Arial 12pt and easily readable up to 6 feet away. Try to stay between 26pt – 40pt for best viewing.

INTRODUCTION
Click here to insert your Introduction text. Type it in or copy and paste from your Word document or other source. Click once on the dashed border to highlight then drag the bottom edge up to fit. Or change the font size to fit the box.
Double-click the border and select “Text Box”, then check “Resize AutoShape to Fit Text” to have the box automatically re-size to your text.
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METHODS AND MATERIALS
Click here to insert your Introduction text. Type it in or copy and paste from your Word document or other source. Click once on the dashed border to highlight then drag the bottom edge up to fit. Or change the font size to fit the box.
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RESULTS
Genographic has provided this template to assist in preparation of a medical or scientific research poster. The dimensions are set to 36” high by 48” wide but prints can also be scaled up proportionally as large as 24” high by 72” wide. When you order your print we will know to scale the original file to the size you specify.
For other sizes, visit us at www.genographics.com or send an email request to info@genographics.com or give us a call toll free at 1.800.790.4001.
The various elements and text boxes included in this template are examples of what we commonly see on posters of this kind. They are simply placeholders and you should feel free to add, delete, re-arrange, rename, or re-size as best suits your needs.
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DISCUSSION
Click here to insert your Introduction text. Type it in or copy and paste from your Word document or other source. Click once on the dashed border to highlight then drag the bottom edge up to fit. Or change the font size to fit the box.
Double-click the border and select “Text Box”, then check “Resize AutoShape to Fit Text” to have the box automatically re-size to your text.
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CONCLUSIONS
Click here to insert your Conclusions text. Type it in or copy and paste from your Word document or other source.
Click on the border once to highlight and select a different font or font size that suits you. This text is in Arial 12pt and is easily readable up to 6 feet away. Try to stay between 26pt – 40pt for best viewing.

REFERENCES
1. Click here to insert your References. Type it in or copy and paste from your Word document or other source.
2. Click on the border once to highlight and select a different font or font size that suits you. This text is in Arial 12pt and is easily readable up to 6 feet away. Try to stay between 26pt – 40pt for best viewing.
3. The top spacing is set to add one-half of a line height after each entry. Select “Format, Line Spacing” to adjust the setting.

CONTACT
Your name
Organization name
Email: Phone: Website:

Figure 1, Label in 24pt Arial.
Figure 2, Label in 24pt Arial.
Figure 3, Chart in 24pt Arial.
Table 1, Label in 24pt Arial.

Poster Design & Printing by Genographics – 1.800.790.4001

MONTANA STATE UNIVERSITY
Mountains & Minds
Informational
26 Duplexes/52 total units
unit description - 1300-1500 sf, 2 bedrooms, 2.5 baths
104 parking spaces w/ 52 garaged
Data visualization is a popular new way of sharing research. Here is a look at some of the visual devices, informational elements, and general trends found in the modern day infographic.

**Chart Style**
Percentage of infographics with the following charts:

- Pie Chart: 22%
- Pictorial Chart: 24%
- Line Chart: 24%
- Bar Chart: 32%

**Font**
- Sans Serif: 85%
- Condensed Sans Serif: 13%
- Serif: 2%

**Countries Featured**
- United States: 88% (most featured)
- China: 22%
- United Kingdom: 12%
- Australia: 12%
- Canada: 12%
- India: 10%
- France: 10%
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**Theme**
Relative popularity of different infographic themes:
- Business (30%)
- Technology (20%)
- Culture (15%)
- Health (15%)
- Politics (5%)
- Environment (5%)

**Key Info**
Percentage of infographics with key:
- Total: 33%
- Average number of symbols per key: 5.1

**Base Color**
- Blue: 29%
- Green: 18%
- Red: 18%
- Yellow: 12%
- Other: 13%

**Navigational/Iconography**
Frequency of arrows & connecting lines in infographics:
- Arrows: 13%
- Lines: 38%
- Both: 13%

**Sections**
Average number of sections per infographic: 2.2

**Credited Sources**
Average number of sources per infographic: 2.29

**Title**
“Richest and Poorest American Neighbor”

**Concept & Design**
Ivan Cash

**Source**
49 infographics collected at random from www.gioda.is/infographics
STRESS AT WORK

Everyone deals with stress at some point in life, and IT administrators are no exception. How serious is the problem and does it affect them negatively?

Is your job as an IT administrator stressful?

YES! 69.1%

No! 30.9%

What is your biggest source of stress?

Management 28.4%

Tight deadlines 19.9%

The users I support 17.7%

Not enough IT staff 17.0%

Not enough budget 16.3%

Other 0.7%

How has your job impacted your personal life?

- I lose sleep 41.7%
- Missed out on social functions 39.7%
- Missed time with my kids 38.7%
- Cancelled commitments 35.3%
- I don't feel great physically 22.1%
- Health issues 19.6%
- It hasn't at all 16.2%
- Ended a relationship 15.2%
- Other 2.0%

In a week, how many hours of overtime do you work?

- None 32.8%
- 1-3 35.4%
- 3-5 15.7%
- 6-8 10.3%
- 8-10 8.3%
- 10-12 5.4%
- 12-15 6.4%
- Over 20 0.7%

Have you ever considered switching careers because of on-the-job stress?

- Yes, regularly 24.5%
- Yes, but only occasionally 42.6%
- No, never 32.8%

How much stress do you think your job gives you compared to others in your social circle?

- I am the most stressed 22.1%
- The same 50.0%
- I feel less stress 23.0%
- I am the least stressed 4.9%

Source: www.gfi.com/stress-survey
Tracking Carbon Emissions

A footprint comparison of total carbon dioxide emissions by nation and per capita shows there's plenty of room for smaller countries to reduce their carbon footprints.

By Stanford Kay
Design
Venue – Poster Requirement's /Guidelines

Conference/Department
Size and Orientation
Mounting
Software
Raster/Vector
Text and Graphics
Printing/Plotting
Digital Posters

Digital poster session using a TEAL classroom in Wilson Hall.
Venue
Poster Requirement's/Guidelines

Conference/Department

**MSSE Electronic Poster Guidelines**

Below are guidelines to follow as you prepare your electronic capstone posters. Since your electronic posters will be posted (in PDF format) in the spring capstone preparation forum, both for feedback and review, and since the posters will be displayed electronically at the summer capstone symposium, it is important that we have some consistency regarding format and organization.

1. The poster may be created in one of a variety of programs such as PowerPoint, Keynote, Illustrator, etc.
2. Please set the page size to 24 inches by 36 inches.
3. The poster may have either a vertical or horizontal orientation.
4. Use no more than 3 to 4 font sizes. It is recommended that you use a different font size for each of the following: title, section headings, text, and graphics (if appropriate).
5. Use easily readable fonts (please no script fonts).
6. Write concisely so as to limit text. Resist turning the poster into a narrative, you already have that in your paper.
   - Remember that a picture (photo, graph, table, etc.) is worth a thousand words - intermix the text with graphics and images whenever appropriate.
7. Be sure to have permissions in place for any photos or graphics used, where appropriate.
8. Please include the MSU MSSE logo or MSU credit citation and appropriately credit your school (or other research site). The MSU logo may be re-sized, but may not be altered in any other way. To access, either
9. Include your name and the location of your project (city, state).
10. The most successful posters have a neutral or faded background.

**AAPT Poster Presentation Guidelines**

You may wish to consider a poster presentation as opposed to the traditional oral presentation because posters allow you more time to present to a much larger audience base.

- Each poster session author will be provided with a 4’x4’ poster board area and mounting pins. The board will indicate the poster number in upper right or left corner.
- Authors are responsible for mounting their posters the morning of their presentation and removing them as soon as the session ends. Posters left up past that time will be discarded.

**Poster Preparation Instructions**

**General Considerations**

Plan to set up your display 15 minutes before the session is to begin. The Annual Meeting Program will indicate the poster board number to which you have been assigned. The presenting author should be available throughout the session and be prepared to have his or her display removed no more than 10 minutes after the end of the session.

Your material should be mounted on poster board or cardboard. Avoid the use of heavy board, which may be difficult to keep in position on the poster surface. If it seems appropriate, it can be helpful to mount conceptually related portions of your display on backgrounds of the same color, as this will help viewers scan the display efficiently.

The poster should be as self-explanatory as possible so that your main job is to supplement the information it contains. The poster format provides a mechanism for in-depth discussion of your research, but this is possible only if the display includes enough information to have a sketch pad and drawing materials available to help you make your points. It is also strongly recommended that the author have a number of copies of the full paper to distribute to interested parties.
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9. Include your name and the location of your project (city, state).

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Venue
Poster Requirement's /Guidelines

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Mounting

Your material should be mounted on poster board or cardboard. Avoid the use of heavy board, which may be difficult to keep in position on the poster surface. If it seems appropriate, it can be helpful to mount conceptually related portions of your display on backgrounds of the same color, as this will help viewers scan the display efficiently.

Supplement the information it contains. The poster format provides a mechanism for in-depth discussion of your research, but this is possible only if the display includes enough information to have a sketch pad and drawing materials available to help you make your points. It is also strongly recommended that the author have available a number of copies of the full paper to distribute to interested parties.
Software

http://www.printcnx.com/resources-and-support/additional-resources/raster-images-vs-vector-graphics/
## Software

<table>
<thead>
<tr>
<th>Raster Paint Software</th>
<th>Vector CAD Software</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adobe Photoshop (.psd)</td>
<td>Autodesk AutoCAD (.dwg)</td>
</tr>
<tr>
<td>CorelDraw (.cdr)</td>
<td>Revit (.rvt)</td>
</tr>
<tr>
<td>Microsoft PowerPoint (.ppt)</td>
<td>Inventor (.ipt &amp; .iam)</td>
</tr>
<tr>
<td>Word (.docx)</td>
<td>MicroStation (.dgn)</td>
</tr>
<tr>
<td>Publisher (.pub)</td>
<td>ArcGIS (.mxd)</td>
</tr>
</tbody>
</table>

| Adobe Illustrator (.ai) | InDesign (.indd) |
Fonts/Typeset

**Serif Font**
- Thick and thin strokes
- Serifs

**Sans Serif Font**
- Plain
- Strokes have even width

Times New Roman

Arial
Font Size

Font (text) Size Ratio = 1” for every 10’

72 points = 1” - Titles
54 points = .75” (3/4)
36 points = .5” (1/2) – Subtitles (and larger)
27 points = .375 (3/8) – Narrative Text
18 points = .25 (1/4) – No text smaller than 18pts

Note: Also depends on size of poster
# Color Contrast/Font

<table>
<thead>
<tr>
<th>Foreground</th>
<th>Red</th>
<th>Orange</th>
<th>Yellow</th>
<th>Green</th>
<th>Blue</th>
<th>Violet</th>
<th>Black</th>
<th>White</th>
<th>Gray</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red</td>
<td>Poor</td>
<td>Good</td>
<td>Poor</td>
<td>Poor</td>
<td>Poor</td>
<td>Poor</td>
<td>Good</td>
<td>Good</td>
<td>Poor</td>
</tr>
<tr>
<td>Orange</td>
<td>Poor</td>
<td>Poor</td>
<td>Poor</td>
<td>Poor</td>
<td>Poor</td>
<td>Poor</td>
<td>Good</td>
<td>Poor</td>
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<td>Yellow</td>
<td>Good</td>
<td>Good</td>
<td>Poor</td>
<td>Good</td>
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<td>Poor</td>
<td>Good</td>
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<tr>
<td>Green</td>
<td>Poor</td>
<td>Poor</td>
<td>Poor</td>
<td>Good</td>
<td>Poor</td>
<td>Good</td>
<td>Poor</td>
<td>Good</td>
<td>Good</td>
</tr>
<tr>
<td>Blue</td>
<td>Poor</td>
<td>Poor</td>
<td>Good</td>
<td>Good</td>
<td>Poor</td>
<td>Poor</td>
<td>Good</td>
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<tr>
<td>Violet</td>
<td>Poor</td>
<td>Poor</td>
<td>Good</td>
<td>Poor</td>
<td>Poor</td>
<td>Poor</td>
<td>Good</td>
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<td>Poor</td>
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<tr>
<td>Black</td>
<td>Poor</td>
<td>Good</td>
<td>Good</td>
<td>Good</td>
<td>Poor</td>
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<td>Poor</td>
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<tr>
<td>White</td>
<td>Good</td>
<td>Good</td>
<td>Poor</td>
<td>Poor</td>
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<tr>
<td>Gray</td>
<td>Poor</td>
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<td>Good</td>
<td>Poor</td>
<td>Poor</td>
<td>Poor</td>
<td>Good</td>
<td>Good</td>
</tr>
</tbody>
</table>
Colorblindness (color vision deficiency)

Typical – Red/Green

Other – Blue/Yellow - confuse some shades of blue with green, and some shades of yellow with violet
Colorblindness (color vision deficiency)

Males 1 in 12
Females 1 in 200

Color blindness is hereditary - passed from mother to son on the 23rd chromosome - son of a woman carrying a faulty gene has a 50% chance of inheriting the faulty X chromosome
Colorblindness (color vision deficiency)

COLORBREWER 2.0

COLOURlovers.com

Test your vision
Graphics

Good to High quality images – 300dpi minimum

600 dpi scaled down

100 dpi and scaled up - pixelated
Design Quiz

Good Design

Bad Design
Printing/Plotting

Large format printer/plotter – 36” wide or larger

Contact print vendor for pricing, printing requirements and preferred file types - i.e pdf or ppt, etc.

Any special printing requests – high gloss paper, mounted on foamboard, etc.

Price and turn around time.
On Campus printing sources - General

Large Format Posters and Banners

- Sizes up to 24" wide by any length
- Conference Displays or Signage
- Papers include:
  - 20# Bond @ $2.00 / Sq. Ft.
  - Lustre Photo @ $6.00 / Sq. Ft.
  - Enhanced Matte @ $6.00 / Sq. Ft.

http://www.montana.edu/printshop/copycats/index.html
Large Format Color Imaging

Size and Quality

University Printing Services has a large format color printer with a maximum image area of 44” wide by a maximum length of 100’ in vinyl, semi-gloss and glossy paper stocks.

We use the EPSON Stylus Pro 9800 printer for the highest quality poster printing output. It’s the perfect way to produce display material for presentations, posters, signs, banners, and artwork. For the optimum in print quality:

- Preferred file types for large format are .ppt and .pdf files.
- If using scanned photos, use 300dpi or higher resolution settings.
- Use high quality images and photos designed to the finished size for best results.
- Avoid using graphics copied from the web, .jpeg and .gif files are not recommended.
- Set the document page size to match the final print size. If you use a smaller proportionate page size, we can enlarge it.

If you are wanting a photo or art quality print, please visit with Conrad, our digital prepress technician to assist you with the results that you expect. For more details, call (406) 994-5708.

Lamination, Mounting and Foam Core Edging

To help protect and enhance your prints we offer lamination for your large format output to protect against moisture or sunlight. We also offer mounting on ultra light weight, stiff, 3/16” white foam core for posters up to 40” x 60”. We will trim the poster as requested for your presentation.

Fast Turn-Around

Upon request, we will provide a reduced size 8 1/2” x 11” copy of your PRINT READY FILE to proof before we print the poster. Your final poster will be available within one working day of receiving a signed proof. (Additional time is required for quantity orders.)

Pricing

Please contact us at (406) 994-5708 for costs and turn-around time estimates.
## Renne Library

### Pricing

<table>
<thead>
<tr>
<th></th>
<th>Black and White</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>Photocopiers</td>
<td>.10¢ / side</td>
<td>N/A</td>
</tr>
<tr>
<td>Printing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8½” x 11”</td>
<td>5¢ / side</td>
<td>50¢ / side</td>
</tr>
<tr>
<td>8½” x 14”</td>
<td>10¢ / side</td>
<td>$1.00 / side</td>
</tr>
<tr>
<td>11” x 17”</td>
<td>15¢ / side</td>
<td>$1.50 / side</td>
</tr>
<tr>
<td>Large Format</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24” x 36”</td>
<td>$2.00 / side</td>
<td>$2.00 / sq. ft.</td>
</tr>
<tr>
<td>36” x 48”</td>
<td>$3.00 / side</td>
<td>$2.00 / sq. ft.</td>
</tr>
</tbody>
</table>

### Spring Semester Hours (January 14 - May 8)

<table>
<thead>
<tr>
<th></th>
<th>Renne Library</th>
<th>Research Center</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday - Thursday</td>
<td>7 am - 2 am</td>
<td>8:30 am - 7 pm</td>
</tr>
<tr>
<td>Friday</td>
<td>7 am - 8 pm</td>
<td>8:30 am - 5 pm</td>
</tr>
<tr>
<td>Saturday</td>
<td>10 am - 5 pm</td>
<td>Closed</td>
</tr>
<tr>
<td>Sunday</td>
<td>9 am - 2 am</td>
<td>1 pm - 6 pm</td>
</tr>
</tbody>
</table>

[http://www.lib.montana.edu/services/print-copy-scan/](http://www.lib.montana.edu/services/print-copy-scan/)
Off Campus printing sources

Ink Outside the Box  www.inkoutside.com

Kinko’s/FedEx – starting at $7.25/sq. ft.


Selby’s  http://www.selbys.com/folders/digital-repro.htm

Alphagraphics  www.alphagraphics.com/centers/bozeman-montana-us690/posters
Examples
Buildings
Restored
Then Fox Theatre
Mother Lode Theatre
Now
Mining the Memories of McQueen
Reconnecting a Community using Technology

Brief History of the McQueen Addition

In 1891 a small community began life on Sunflower Hill, named for the yellow flower that covered the hill. This newly formed community was named McQueen after the McQueen placer mining claim. In 1901 McQueen had grown to approximately 15 homes. People moved to McQueen from primarily two locations, mining camps from around the United States and from fast growing Meaderville, its neighbor to the west. The population of McQueen reached 1390 residents in 1957. In 1955, the Berkeley Pit started, and by the late 1960s there were fewer than 300 homes in McQueen. McQueen entered into history as a gone, but not forgotten neighborhood on August 29, 1979 when two of the area landmarks, Holy Savior church and school, were buried by the Anaconda Mining Company.

Reconnecting a Community using Technology

Some say that the wealth of a town lies in its communities, neighborhoods and people, but for some towns the wealth also lies beneath. The McQueen Addition was rich with minerals beneath, but the most valuable item extracted from the McQueen Addition was the people. Members of the McQueen Addition (PCA) have worked hard over the years to reconnect their community.

Press for voice of George Spear
Class Examples
Institutions of Higher Education in Montana: A Chronology
Technology Literacy
how literate are you?

Introduction

According to Prensky, everyone falls into two categories dictated by your generation and associated technology literacy – you are either a Digital Native or a Digital Immigrant. Those exposed to technology since birth are considered Digital Natives, while those that have adapted to technology are categorized as Digital Immigrants. This categorization has, in essence, created a separation, a generational divide created by your level of technology literacy.

The primary focus of this qualitative research pilot study is to explore the generational divide in higher-education classrooms, and does informational technology (technology literacy) play the part of equalizer or separator?

Methods

The purpose of this phenomenological study was to explore student’s definitions of technology literacy of generationally diverse students at a large university located in the Rocky Mountain Northwest.

Research Questions

RQ1 What does it mean to students to be technology literate?

RQ2 What are student’s perceptions of technology literacy as it pertains to their academic career?

Five participants were selected using a snowball sampling method.

Personal interviews were used to collect data.

Nine questions were used to gauge their perception of technology literacy as well as what it means to them to be technology literate.

Data analysis was conducted using the field notes and the information collected during the interviews.

Theme analysis was used to identify common threads between definitions and meaning of technology literacy of the participants.

Commonalities were graphically organized in a concept map.

Results

All participants shared a common tenet for defining technology literacy:

“ability to use technology without having to be specially talented to accomplish whatever task you have set.”

Participants were divided when asked if they believed the integration of technology into a classroom equalized or divided the students especially in regards to age.

Participant’s equally felt their technology literacy levels did not equalize them in their class as well as separates them.

Participant’s first experience with computers was in a informal setting such as with a family member.

Discussion

The institution as a whole seems to fail short in preparing student technologically to be ready for careers using cutting edge technology.

Separation in a classroom can also happen when someone is more technology literate than the population in the classroom.

Dale’s theory reinforces the participant’s responses regarding experience and the hands-on tactile use of technology aiding to their literacy.

References


Digital Native or Digital Immigrant
which group do you belong to?

Introduction
Are the multi-generational classrooms of higher education being separated by informational technology or equalized due to the integration of technology into these diverse classrooms? Since the bold proclamation from Prentky that everyone falls into one of two categories dictated by your generation and associated technology literacy – you are either a Digital Native or a Digital Immigrant. Those exposed to technology since birth are considered Digital Natives, while those that have adapted to technology are Digital Immigrants.

The primary focus of this quantitative research study is to determine if there is a generational divide between digital native and immigrants that comprise higher education classrooms due to students’ interaction and comfort level with technology (technology literacy) to support their learning.

Research Questions:
What are the demographics and characteristics of students who use technology to support their learning?
Does the interaction and comfort level differ between students in a classroom enhanced with technology such as MSU’s TEAL classrooms?

Methods
This pilot study was exploratory in design using descriptive research design used results of a survey designed to elicit participant interaction and comfort level with technology in higher education to support learning.

Participants for this study were from six intact Technology Enhanced Active Learning classrooms on the MSU campus.

Survey Monkey was used to administer the survey within the last two weeks of October and the first two weeks of November.

Descriptive statistics were used to analyze the demographic and attitudinal data to better understand the population and interaction and comfort level with technology.

In addition to analyzing means, standard deviation, frequency table, cross-tab and chi-square tests were performed to see if there was a relationship between generational divide and technology.

Discussion
This surveyed demographic has a computer at home as well as a laptop and smartphone, but not a tablet.

As a whole feel confident with technology upon enrolling at MSU as well as currently.

Feel their computer experiences have been beneficial.

Comfortable with their level of interaction and general knowledge of computers to support their learning.

Comfort levels seemed to decline in the areas of computer knowledge such as using database and spreadsheet software.

Levels also declined in the area of technology systems, resources and services.

Results
The dominate participant demographic for this pilot study was a white male Millennial student graduating from a high school in a town larger than 20,000 outside of Montana owning a variety of personal computing device.

Demographics (n=42)
55% male
45% female

Class Rank
60% Freshman
12% Sophomores
8% Juniors
20% Seniors

Ethnicity
88% White
Caucasian
7% Hispanic
4% Asian
2% Black or African American

Generational Group
94% Millennial
3% Generation X
3% Baby Boomer

All three generations are medium to heavy users of technology.

<table>
<thead>
<tr>
<th>Year</th>
<th>Percentage of Each Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>94% Millennial, 3% X, 3% Boomer</td>
</tr>
<tr>
<td>2015</td>
<td>94% Millennial, 3% X, 3% Boomer</td>
</tr>
</tbody>
</table>

The results of this analysis indicate that there is no evidence of a relationship between interaction and comfort level and generational levels. This can be, in part, contributed to the considerable generational imbalance in the sample.

References


EDCI 607 Quantitative Methods for Education/Social Science Research Poster Presented By: Steve Luft
Questions
&
Evaluations
Resources

Tips for creating posters
http://gradschool.unc.edu.academics/resources/postertips.html - templates
http://www.dartmouth.edu/~ugar/undergrad/posterinstructions.html
http://colinpurrington.com/tips/poster-design
http://undergraduateresearch.as.ua.edu/presenting-your-work/making-posters/
http://writing.wisc.edu/Handbook/presentations_poster.html - design
https://www.youtube.com/watch?v=TyZSOTdZGUc&spfreload=10
https://www.youtube.com/watch?v=8QlvMQA9B6U&spfreload=10
http://guides.nyu.edu/content.php?pid=174875&sid=1471885
http://www.personal.psu.edu/drs18/postershow/
Resources

Poster Templates
http://www.genigraphics.com/templates/
http://identitystandards.illinois.edu/graphicstandardsmanual/othermedia/posterpresentation.html
http://undergraduateresearch.buffalostate.edu/poster-templates
http://identitystandards.illinois.edu/graphicstandardsmanual/othermedia/posterpresentation.html

The Margaret Warner Graduate School of Education and Human Development
Resources

Misc – Color Blindness – 1 in 12 males are red/green color blind
http://www.archimedes-lab.org/colorblindnessstest.html
http://www.colour-blindness.com/general/prevalence/
http://www.colormax.org/color-blindness-facts.htm

Center for Faculty Excellence Resources

Credits towards the Certificate of Teaching Enhancement and Center Membership that are earned by attending these workshops listed at the end of the workshop descriptions.

Information about the Certificate of Teaching Enhancement:
http://www.montana.edu/facultyexcellence/TLResources/CertificateofTeachingEnhancement.html

and

Center Membership:
http://www.montana.edu/facultyexcellence/documents/CFE.%20membership%20program%20F16.pdf