

DATA ANALYSIS AND REPORTING

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CONNECTING AMERICA'S COMMUNITIES

WELCOME

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Broadband Technology Opportunities Program (NTIA)

HOUSEKEEPING

- Asking Questions
- Slides, support materials, and questions and answers from the Webinar are available at <http://broadbandworkshop.pbworks.com>
 - If you don't yet have a password for the wiki, "Request Access"



Your presenters

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Today's agenda

- Basic principles of analysis & reporting
- Communication & findings
- Approaches to quantitative analysis
- Approaches to qualitative analysis

BASIC PRINCIPLES

Analysis with a purpose

Why we do analysis & reporting

- Answering evaluation questions
 - Is the program doing well or poorly?
 - Who is benefitting from the program?
 - Are we achieving expected outcomes?
 - Are there problems that need remediation?
 - Have external factors affected outcomes?
- Making programmatic choices
- Accountability
- Telling a story

Golden rules

- Match analysis and reporting to audience and stakeholders
- Go back to needs assessment and evaluation questions
- Take care with the level of complexity
- Make limitations clear

COMMUNICATION & FINDINGS

Audiences & forms

Basic principles

- Take care in the way statements are made
 - Generalizing on small samples or low response rates
 - Couching comments based on your sample
 - Being honest and not misleading
 - Not conflating
 - Making limitations clear
- Structure in a purposeful way
 - Vary structure for audiences
 - Explain why you're doing what you're doing
 - Show your data plainly

Forms of communication

- Evaluation reports
- Reports to funders
- Fact sheets
- Letters
- Blog posts
- Proposals
- Conferences
- Presentation

What to include in an evaluation report

- Executive summary
- Background about program/needs assessment
- Methods use in evaluation (survey, interviews, programmatic data)
- Limitations to methods
- Findings
- Implications
- Appendices (complete survey/interview/programmatic data)

Steps for evaluation analysis

- Look at aggregate data
 - Compare overall results to previous time periods
 - Compare overall results to targets
 - Compare overall results to similar programs or external standards
- Breakout data
 - Breakout outcomes by important client characteristics
 - Breakout outcomes by different services
 - Compare to previous time periods
- Contextualize outcomes to inputs and outputs
 - Look for consistency among inputs, outputs, and outcomes
 - Create sets of outcomes
- Interpret results
 - Highlight key findings
 - Explain anomalies
 - Make recommendations for future action
- Decide how to present data in a report

(Hatry, 2006, Performance Measurement: getting results)

Interpretation and judgment

- Focus on results that matter
- Keep it simple
- Link the evaluation to decisions

APPROACHES TO QUANTITATIVE DATA

Choosing the right analysis method

Where to begin

- Look at your evaluation questions for guidance about what variables to analyze
- Create simple analysis of all data in aggregate form
- Break out according to important characteristics of programs or clients (setting contextual description)
- Group outcomes in sets
- Identify key findings
- Identify anomalies
- Create visualizations

Type of variables

- Categorical
 - Two or more categories
 - No intrinsic ordering
 - Examples
 - Male, female
 - Blonde, brunette, red
- Ordinal (Likert scales)
 - Similar to a categorical variable
 - Has an intrinsic ordering (lowest to highest)
 - Does not have equal spacing between categories
 - Can never be averaged
 - Saying “rank on a scale of 1-5” is still an ordinal variable
- Interval
 - Like an ordinal, but with equal intervals
 - Has to be real numbers
 - Intervals have to be equal to average

Analyzing categorical variables

- Show aggregate response frequency and percentage
- Break out according to important characteristics

	Number/percent of participants		
How participant learned about the program	West-end Center	East-end Center	Total
Advertisement	24 46%	28 53%	52 25%
Friend/family	29 36%	51 64%	80 38%
Program staff	34 44%	43 56%	77 37%
Total	97 46%	122 54%	209

Analyzing ordinal variables

- Similar approach to categorical variables
- Present categories as given to respondents
- Present multiple variables with same scale together

	Frequency of activity				
Type of use	Daily	Few times a week	Few times a month	Few times a year	Never
Keep up with current events	50%	21%	6%	1%	22%
Social networking	36%	12%	5%	3%	41%
Homework	36%	23%	14%	6%	20%
Looking for a job	24%	25%	18%	7%	25%

Why don't we average ordinal variables?

- Central tendency bias
- Social desirability bias
- Cultural differences
- Ordinal variables may be averaged only if the categories are symmetrical and equidistant:

Sometimes OK:	Never OK:
Completely agree=1	Excellent=1
Mostly agree=2	Very good=2
Somewhat agree=3	Good=3
Somewhat disagree=4	Fair=4
Mostly disagree=5	Poor=5
Completely disagree=6	

Analyzing interval variables

- Create groups of values and treat as ordinal variables -or-
- Report means, medians, and/or modes

Time in minutes spent using public access computers	
Time	Number of clients
7	6
9	4
12	5
13	7
17	11
21	14
27	8

Groupings

1-10: 10 clients

11-20: 23 clients

21-30: 22 clients

“The majority of clients used the computers for between 11 and 30 minutes”

Mean: 16.8

Median: 17 minutes

Mode: 21 minutes

“The average amount of time spent on the computers was 17 minutes”

VISUALIZATIONS

What types to use and when

Types of visualizations

- Tables
- Graphs
- Charts
- “Smart Art”
- Tag clouds

Tables

- Use tables to show a cross-tabulation between two questions (use of library computers for civic engagement and type of access to broadband)
- Can be used with any type of variable

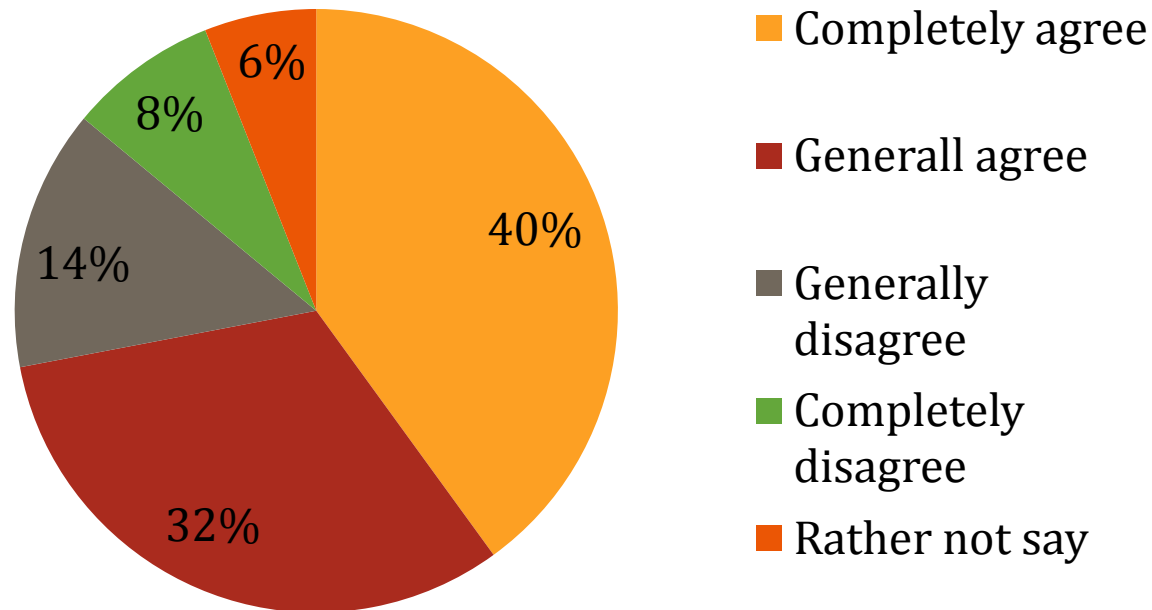
Table 1: How public access technology patrons used library computers for civic engagement (n=148)

	Type of Broadband access		Total
	% with access at home	% with access only at library	
Used library computers to:			
Keep up with news/current events	80	85	81
Learn about political activity/candidate or social cause	80	81	80
Make a donation to political candidate/cause	10	10	10
Learned about starting club/non-profit	16	15	16
Organized/managed club, civic/community/church group, or non-profit	27	20	25

Pie charts

- Use pie charts to show single dimension categorical or ordinal variables that add up to 100%

Percent of respondents (n=97)

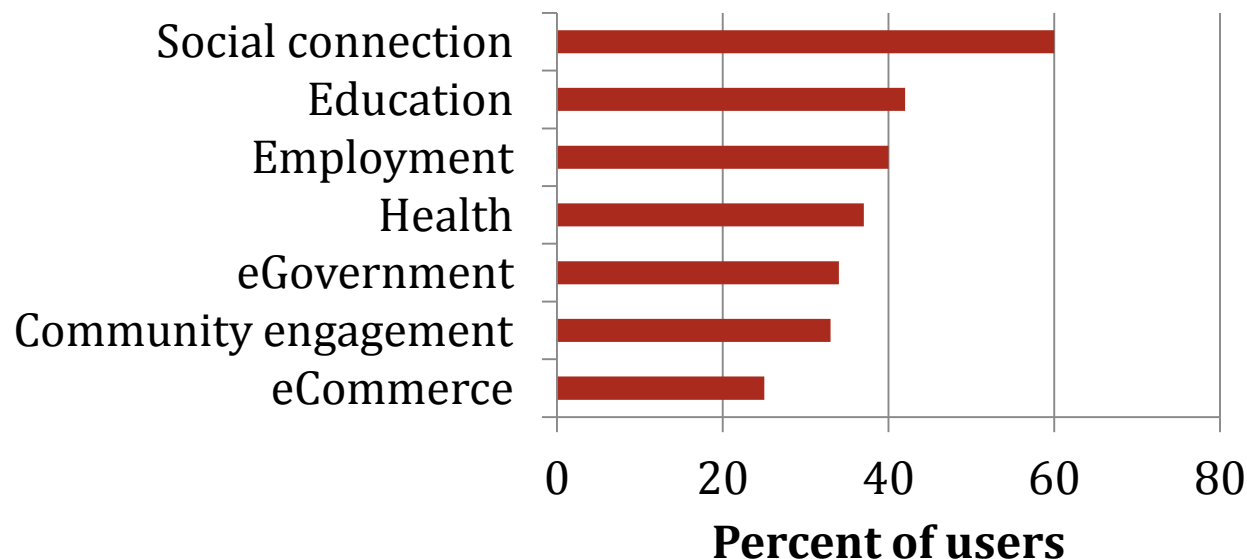


“72% of respondents completely or generally agreed.”

Bar graphs

- Use to compare categorical variables that aren't mutually exclusive.
- Can show cross-tabulation, but use cautiously
- Arrange from largest to smallest (not by survey question)

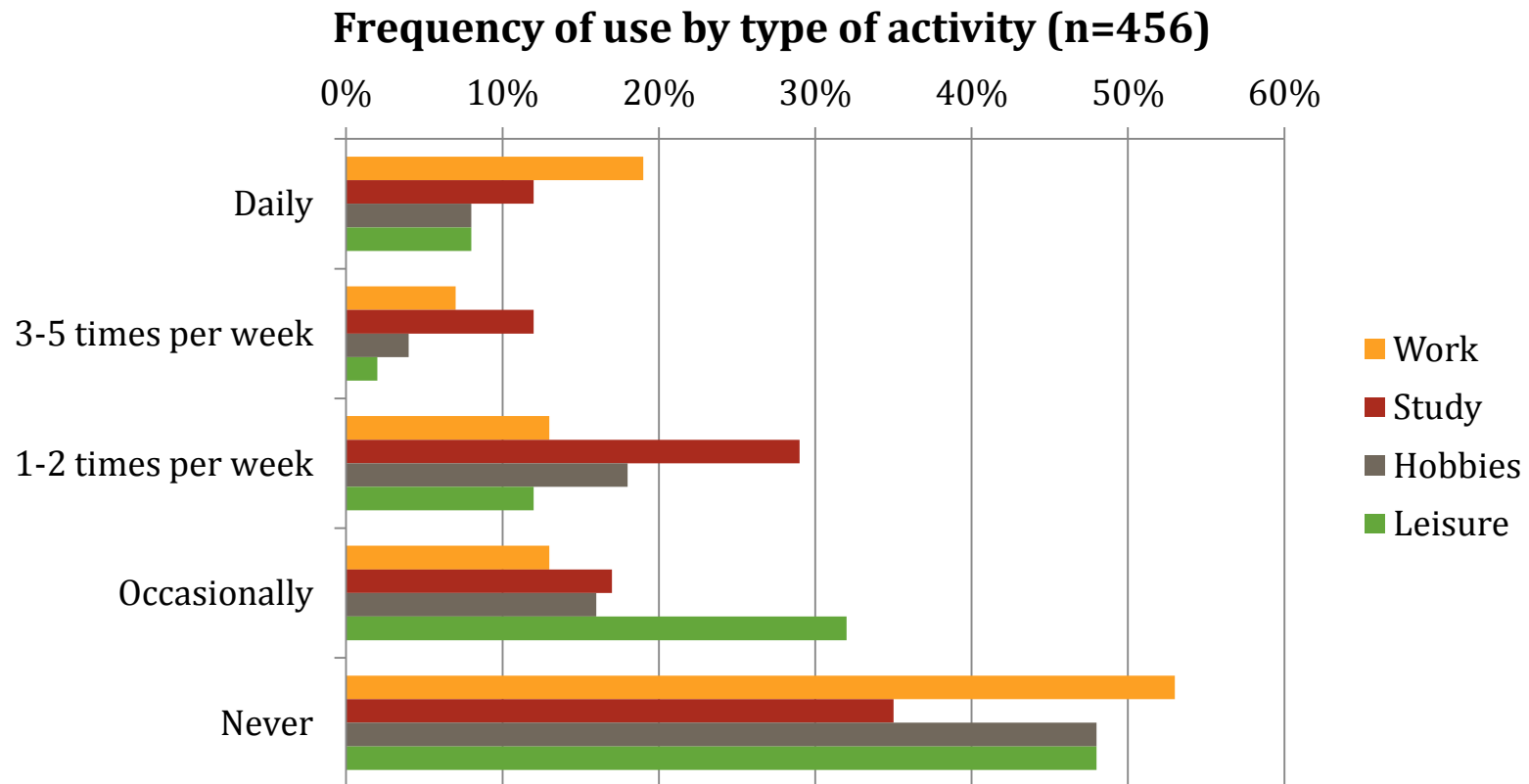
Types of public access computer use



“Use of the public access computers for social connection activities were the highest among survey respondents, 60% of whom reported using library computers for this purpose.”

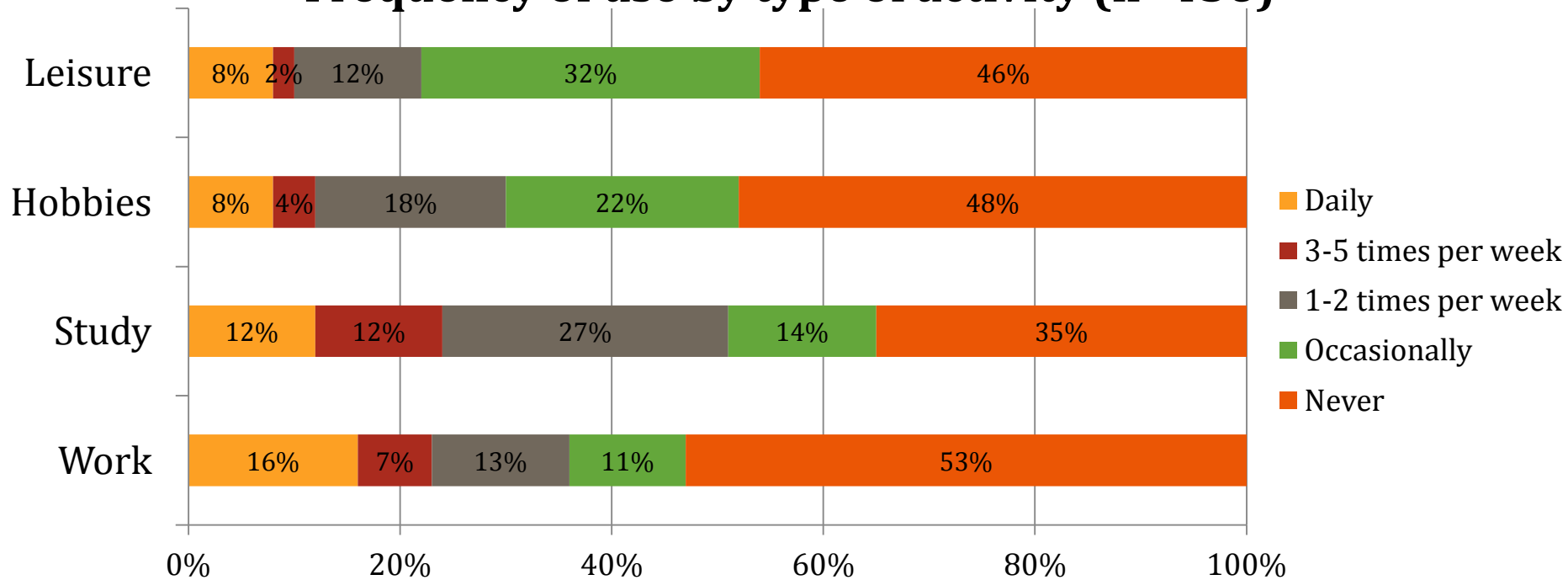
Cross-tabulated bar graphs

- Be cautious using bar graphs for cross-tabs. They can be effective, but can get messy and difficult to read fairly quickly.



A sometimes better way to crosstab bar graphs

Frequency of use by type of activity (n=456)

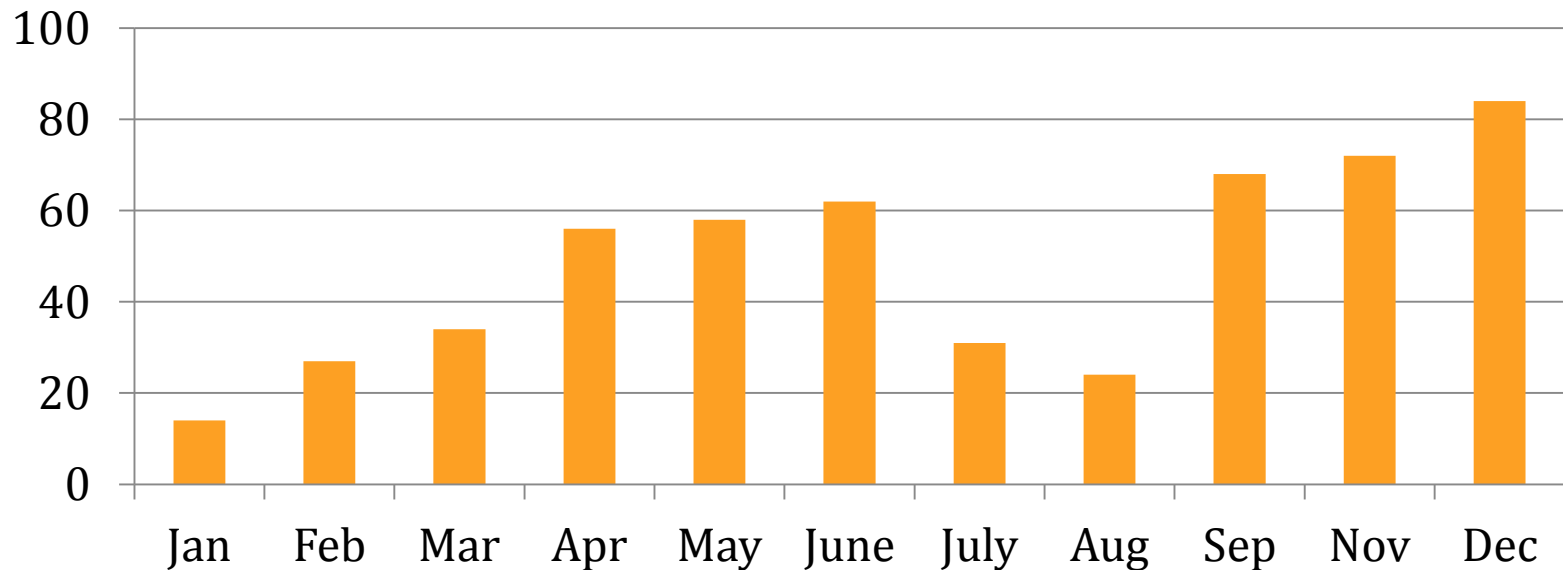


Of those engaged in activities, work and study related activities were engaged in with greatest frequency, with 24% of respondents studying at least 3 times a week, and 23% of respondents doing work-related activities at least 3 times a week. Study related activities were engaged in by the greatest number of respondents; however work-related activities were engaged in by the fewest respondents overall.

Column charts & line graphs

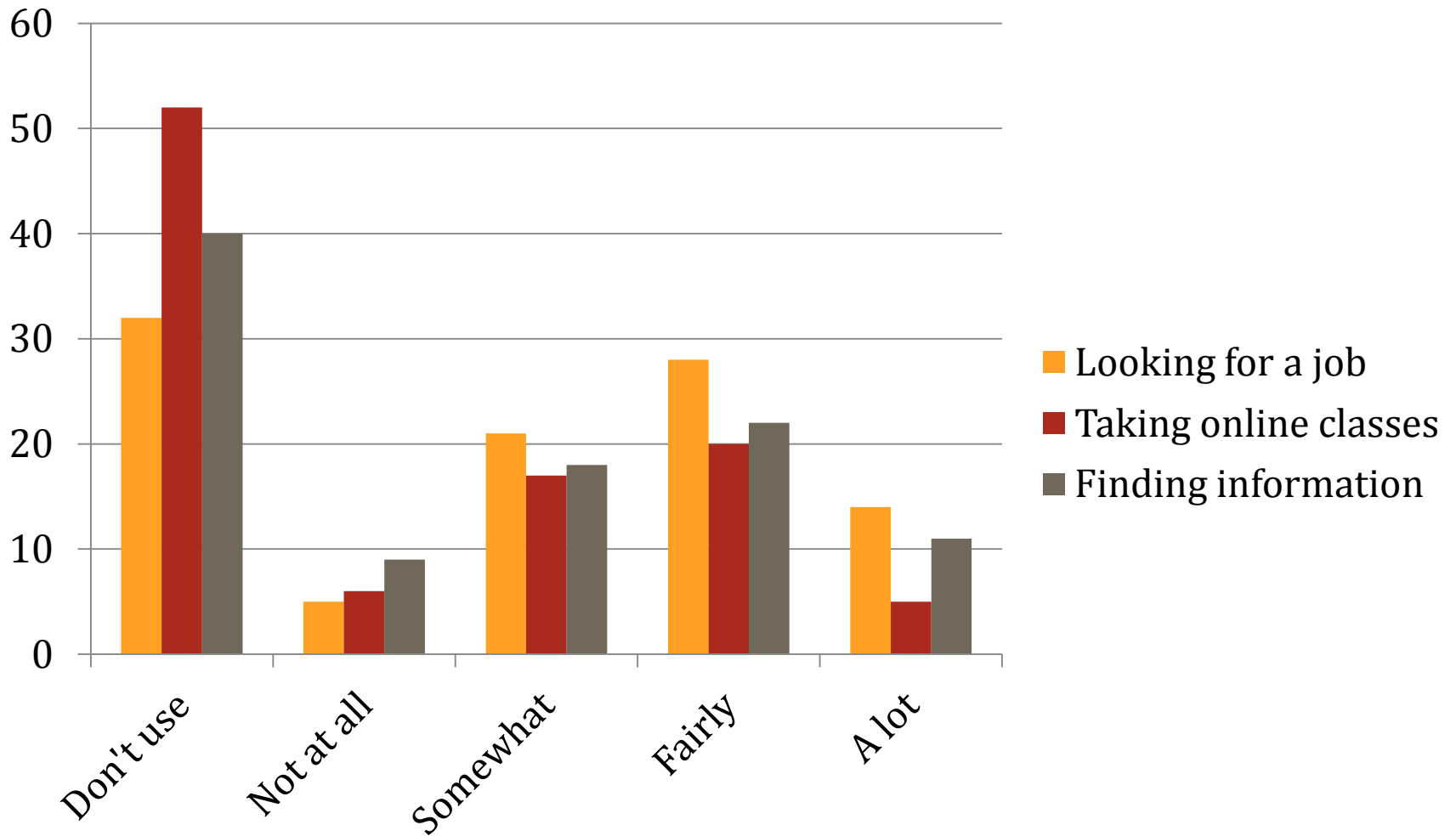
- Use column charts & line graphs to show change over time or ordinal variables

Number of visits



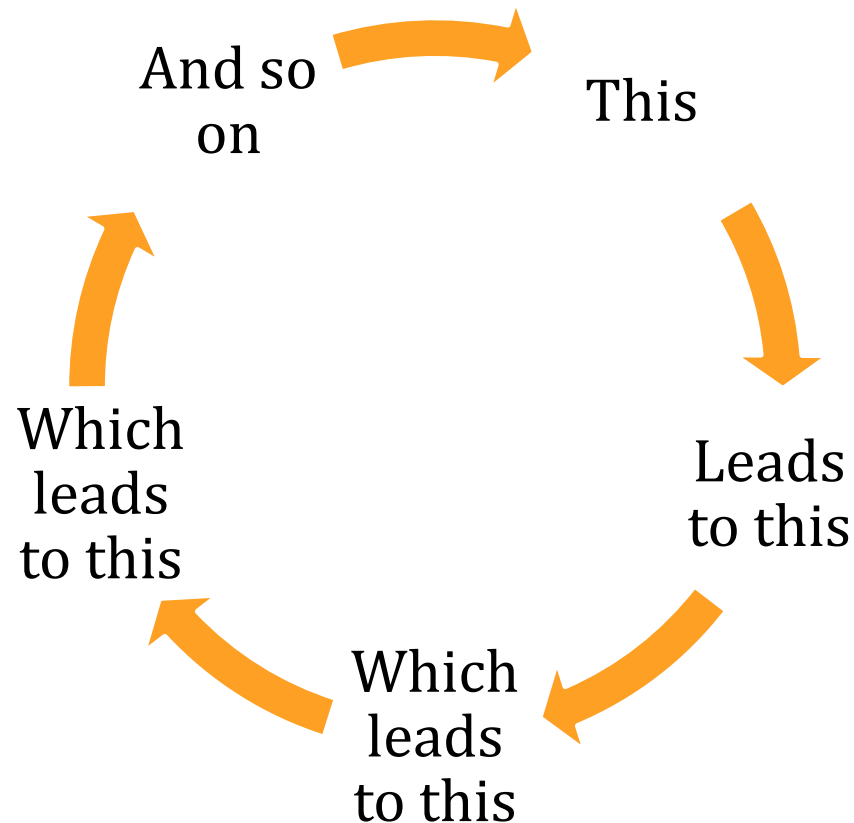
“The number of visits steadily increased from January through June. They fell off during the summer months, but picked up again in September (at the start of the school year). At the end of December, the number of visits were six times as many as we started in January.”

Cross tabulating column charts



“Smart Art”

- Use to show processes/cycles
- Be judicious



Tag clouds

- Shows the words people use
- Useful for introducing qualitative analysis
- Can't stand on its own as a presentation of data



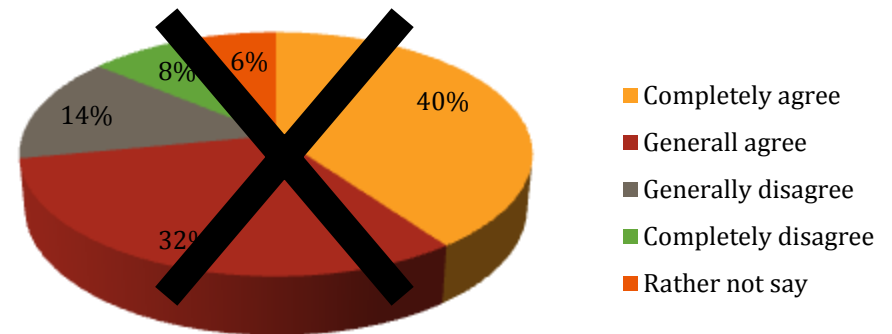
Visualization dos

- Do use tables & show the “N”
- Do show multidimensional data (carefully)
- Do use visualization to show interesting findings
- Do make sure that visualizations print in black and white
- Be consistent about using visualizations
- Keep formatting consistent

Visualization don'ts

- Don't tilt your pie
- Don't lop off your bars
- Don't forget your labels
- Don't get carried away with 3D
- Don't cherry pick

Percent of respondents



APPROACHES TO QUALITATIVE DATA

Finding patterns and summarizing

Basics of qualitative analysis

- Finding patterns through coding
 - What's going on?
 - What's the meaning of what's being said?
 - What are the assumptions behind statements?
 - What's the context?
- Turning anecdotes into data:
 - Create codes of themes, ideas, concepts, keywords
 - Assign codes to quotes
 - Count up quotes
- Reporting on codes
 - Use counts, not percentages
 - Choose exemplars for themes

Themes to code

- Outcomes: changes in behaviors, knowledge, or situations
- Events: things clients have done or plan to do
- Ways clients have applied new skills
- Changes in world views, values, ambitions
- Participation in new activities that have meaning
- New or changed relationships with others
- Meta-cognition

WRAP UP

Resources to help you

- Huff, D., & Geis, I. (1954). *How to lie with statistics*. New York: Norton.
- Analyzing Outcome Information: Getting the Most from Data <http://www.urban.org/publications/310973.html>
- Google chart tools: <http://code.google.com/apis/chart/>
- Wordle: <http://www.wordle.net/>

Wrap up

- Webinar slides and recommended resources will be available at <http://broadbandworkshop.pbworks.com>
- Next webinar: Data analysis and reporting office hours April 18, 1:00 EDT
- Final webinar: Using Evaluation Results for Decision-Making and Mobilizing Support May 2, 1:00 EDT
- Your candid feedback about today's session and the webinar series overall is welcome and encouraged
 - Contact Francine Jefferson (FJefferson@ntia.doc.gov)