Disseminating Research and Writing Research Proposals

- Research proposals
- Research dissemination
Research Proposals

Many benefits of writing a research proposal

- Helps researcher clarify purpose and design of research
- Reveals strengths and weaknesses of planned approach
- Used to secure funding or approval to conduct research
- Serves as a logical plan and guide when carrying out research
Research Proposals

Research funding

Most funding agencies require proposal for research in order to be considered for funding

Agencies often have annual deadlines, specific proposal guidelines, sample proposals

After deadline, proposals evaluated by agency staff and/or peer review committees

Often evaluated and ranked on specific criteria

If funded, researcher usually provides agency with annual or semi-annual updates on research progress, and a final report
Research Proposals

- Finding sources of funding
  - Ask senior researchers in field
  - Professional organizations
  - Reference works (print and online) such as The Foundation Grants Index, Directory of Research Grants, The Grants Register
  - Community of Science Funding Opportunities Database
    - http://fundingopps2.cos.com/
  - GrantSelect
    - http://209.61.189.163/gs/cgi-bin/welcome.pl
Research Proposals

Examples of LIS-related funding agencies

- American Library Association (ALA)
  - http://www.ala.org/Template.cfm?Section=grantfellowship
- Institute of Museum and Library Services (IMLS)
- American Society for Information Science & Technology (ASIS&T)
  - http://www.asis.org/awards/awardchart.htm
- National Science Foundation (NSF), National Endowment for the Arts (NEA), National Endowment for the Humanities (NEH)
Research Proposals

Components of research proposals

- Title page
  - Representative proposal title, researcher name(s) and affiliations

- Abstract
  - Concise and clear summary of the goals, major activities or research approach, and anticipated results of the proposed research
  - Often the first and only part of proposal read by some reviewers
  - Should be very well-written and revised after body of proposal is completed
Research Proposals

Components of research proposals

- Table of contents
  - When appropriate, provides an overview of structure of proposal

- Introduction
  - Introduces topic of study, structure of remainder of proposal
Research Proposals

- Components of research proposals
  - Statement of problem
    - Lead in and context of research problem
    - Why problem is important
    - How research would benefit or advance solutions to problem
    - Description of component sub-problems, if applicable
Research Proposals

Components of research proposals

- Literature review
  - Review and relate previous research relevant to proposed research
  - Evaluate methodology and findings of previous related work
  - Describe how proposed research will differ and/or expand on previous work
  - When applicable, describe any theoretical or conceptual framework that underlies the proposed research
Research Proposals

Components of research proposals

- Research questions or hypotheses
- Conclude reflective inquiry section by stating specific research questions or hypotheses that proposed research will investigate
- Define key terms as necessary
- If hypotheses will be tested, state significance level
Research Proposals

Components of research proposals

- Research design
  - Describes the research methodology
  - How study will be organized and conducted
  - Characteristics of population or sample
  - Techniques for data collection
  - Description of data collection instruments, pilot studies
  - How data will be analyzed, in general (descriptive or inferential statistics)
  - Limitations of the research design
Research Proposals

Components of research proposals

- Institutional resources
  - Description of resources used to support research that are provided by researcher’s institution
  - Computers, library resources, other equipment

- Personnel
  - Description of people involved in conducting proposed research
  - Demonstrate distribution of work among personnel, qualifications to complete tasks
Research Proposals

Components of research proposals

- Budget
  - Estimates of salary costs (based on personnel hours), equipment costs, travel costs, materials and supplies, etc. necessary to complete project
  - Salaries often include fringe benefits, institutional costs (indirect costs)
  - Often organized by tasks and stages of project timeline
  - Budget should be determined after research design, not before
Research Proposals

Components of research proposals

Timeline

Schedule showing when all major project tasks will be conducted and completed

Even when not required by funding agency, useful for identifying all necessary tasks and creating realistic schedule for completion
Research Proposals

Components of research proposals

- Anticipated results and conclusion
- Description of expected benefits of proposed research
- Re-emphasize context and value of proposed research

Bibliography

- Should include all items mentioned in the literature review
Research Proposals

Components of research proposals

Appendices

Additional resources directly relevant to proposal; depending on funding agency guidelines, may include:

- Resumes/CVs of key personnel
- Letters of support
- Detailed budgets and timelines
- Institutional descriptions
Research Proposals

- General proposal guidelines
  - Should be well-written
  - Clearly communicate essential material
  - Present convincing, well-supported argument for proposed research
  - Logical, well-formatted organization
  - Headings and subheadings
  - Appropriate and consistent margins, fonts, pagination, spacing
Research Proposals

General proposal guidelines

Should be careful to avoid:

- Not following agency guidelines
- Omitting or incompletely presenting required sections
- Glossing over details that haven’t been thought through
- Proposing research that needs more preliminary development
- Proposing research researcher is not qualified to conduct
- Presenting inappropriate research design for question to be investigated
Research Proposals

Proposal evaluation criteria

- Varies depending on agency and program of funding
  - Is proposed problem significant? Is it worth solving?
  - Is research appropriate to this funding agency and program?
  - Is proposed research innovative in approach to problem?
  - Is the proposed research design appropriate to investigating problem?
  - Are the researchers qualified to conduct proposed research?
  - Are there appropriate plans to evaluate research conducted?
  - Are the budget, timelines, and resources proposed realistic to complete the research?
Research Proposals

- Research proposal example

Institute of Museum and Library Services (IMLS)

Mission of IMLS:

“The Institute of Museum and Library Services is an independent Federal grant-making agency dedicated to creating and sustaining a nation of learners. The Institute fosters leadership, innovation, and a lifetime of learning by supporting the nation’s 15,000 museums and 122,000 libraries. The Institute also encourages partnerships to expand the educational benefit of libraries and museums.”
Research Proposals

- Research proposal example

Examples of recent proposals funded by IMLS:

- “Investigate the impact of the Internet on public library use via a national telephone survey ... document how people are currently using the public library and the Internet and identify the ways in which libraries and the Internet are competing with and complimenting one another”

- “Train librarians to build interactive multimedia Web sites for library user education and to evaluate these sites to determine their effectiveness for conveying user education content”

- “Develop solutions to two issues facing national interoperability of government data: (1) incompatibility of metadata indexes, and (2) inconsistency in the use of controlled vocabularies for classification of government World Wide Web documents and files”
Research Dissemination

- Research is not complete unless it is shared
  - Present research problem or question to readers and convey why it is important to investigate
  - Describe how you have investigated the problem
  - Present the data collected and interpret the significance of the data
  - Explain how the results resolve or further understanding of the research problem or question
Research Dissemination

- Benefits of disseminating research results
  - Enables others to learn from completed and on-going research
  - Enables researcher to get feedback from others
Research Dissemination

- Important considerations when writing research report
  - Who will be the target audience?
  - Which is the best venue to reach audience?
  - How can the research findings be best presented to target audience?
Research Dissemination

Publication venues

Research topic, scope and type of research, desired audience all factors in deciding appropriate venue

Monographs

Scholarly journals, bulletins, newsletters

Professional journals, magazines, newspapers

Conference presentations - often include papers (long and short) in proceedings, or a poster

Unpublished reports (theses, internal and technical reports)
Research Dissemination

- Presenting research findings

  - Several ways that data and statistics can be presented:
    - Text
    - Tables
    - Figures, charts, graphs

  - Use most effective vehicle for enabling reader to comprehend and compare results

- Presenting Data (Gary Klass): http://lilt.ilstu.edu/gmklass/pos138/datadisplay/
- Gallery of Data Visualization: http://www.math.yorku.ca/SCS/Gallery/
Research Dissemination

- Presenting data and statistics in text
  - Include statistics inside parenthesis
  - Casual reader can easily skim past numbers in parenthesis while reading the text
  - Critical reader can read material in parenthesis as part of text
  - Example: “There were no age effects except for action recognition ($t=2.32$ with 178 df, $p=0.0214$), where the older participants performed better (mean score of 4.7 versus 4.4).”
Research Dissemination

- Presenting data and statistics in tables and charts
  - Tables and charts supplement text
    - If all items in table or chart are discussed in text, no need for table or chart
    - Usually, text describes general characteristics or trend of data, highlights significant points, and table or chart shows complete details
  - Table or chart should be objective presentation of data
- Use clear and explanatory titles for tables and charts
  - Example: “Table 2. Mean performance scores, by video”
Research Dissemination

**Presenting data in tables**

- If intention is to show exact quantities, use table not chart
- Tabular display is intended to simplify presentation of statistical data that otherwise must be presented in a textual discussion
- Generally, a table should be accompanied by some text directly related to the content of the table
- Three general characteristics of a good table:
  - Should present meaningful data
  - Data should be unambiguous
  - Should convey ideas about the data efficiently
Research Dissemination

Presenting data in tables

1. Table titles, column headings and footnotes should precisely define what each data point in the table means.
2. Sort data by the most meaningful variable (usually not alphabetically).
3. When a time variable defines columns, display time in adjacent columns, from left to right.
4. When time points are in a column, sort so that the most recent year is at the bottom.
Research Dissemination

- Presenting data in tables
- Sorting data by meaningful variable versus sorting alphabetically

<table>
<thead>
<tr>
<th>Team</th>
<th>W</th>
<th>L</th>
<th>Pct</th>
<th>GB</th>
</tr>
</thead>
<tbody>
<tr>
<td>New York</td>
<td>103</td>
<td>58</td>
<td>.640</td>
<td>--</td>
</tr>
<tr>
<td>Boston</td>
<td>93</td>
<td>69</td>
<td>.574</td>
<td>10.5</td>
</tr>
<tr>
<td>Toronto</td>
<td>78</td>
<td>84</td>
<td>.481</td>
<td>25.5</td>
</tr>
<tr>
<td>Baltimore</td>
<td>67</td>
<td>95</td>
<td>.414</td>
<td>36.5</td>
</tr>
<tr>
<td>Tampa Bay</td>
<td>55</td>
<td>106</td>
<td>.342</td>
<td>49</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Team</th>
<th>W</th>
<th>L</th>
<th>Pct</th>
<th>GB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baltimore</td>
<td>67</td>
<td>95</td>
<td>.414</td>
<td>36.5</td>
</tr>
<tr>
<td>Boston</td>
<td>93</td>
<td>69</td>
<td>.574</td>
<td>10.5</td>
</tr>
<tr>
<td>New York</td>
<td>103</td>
<td>58</td>
<td>.640</td>
<td>--</td>
</tr>
<tr>
<td>Tampa Bay</td>
<td>55</td>
<td>106</td>
<td>.342</td>
<td>49</td>
</tr>
<tr>
<td>Toronto</td>
<td>78</td>
<td>84</td>
<td>.481</td>
<td>25.5</td>
</tr>
</tbody>
</table>

Final standings 2002 season
Research Dissemination

Presenting data in charts

Guidelines from Edward Tufte

- Purpose of analytical displays of information is to help reader think about evidence
- So, when designing an analytical display, the first question should be: What are the evidence-thinking tasks that this display is supposed to serve?
  - Understanding characteristics of the data
  - Making comparisons
  - Understanding causality
  - Assessing credibility of data and analysis
Research Dissemination

Presenting data in charts

<table>
<thead>
<tr>
<th>Race</th>
<th>Median Household Income, 1999</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asian*</td>
<td>$55,525</td>
</tr>
<tr>
<td>White</td>
<td>$44,232</td>
</tr>
<tr>
<td>Hispanic</td>
<td>$33,455</td>
</tr>
<tr>
<td>Black</td>
<td>$30,436</td>
</tr>
</tbody>
</table>

*Asian or Pacific Islander
Bureau of Labor Statistics:
http://www.bls.census.gov/cps/ads/2001/susenote.htm

Good chart

Bad chart
Research Dissemination

Presenting data in charts

Guidelines from Edward Tufte:

- Depict the data, and primarily the data
- Induce the audience to reflect on the meaning of the data, rather than the design of chart
- Avoid distorting the meaning of the data
- Present many numbers in a small space
- Summarize large data sets and make them coherent
- Encourage visual comparisons among data
- Describe clearly and put into context
Research Dissemination

- Presenting data in charts
- Variety of charts readily available (example is from Excel)
Research Dissemination

Presenting data in charts - line charts
Research Dissemination

Presenting data in charts - bar charts
Research Dissemination

Presenting data in charts - pie charts

Books checked out by age group

- 0-10
- 11-20
- 21-40
- 41-60
- 61+

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-10</td>
<td>34</td>
</tr>
<tr>
<td>11-20</td>
<td>26</td>
</tr>
<tr>
<td>21-40</td>
<td>53</td>
</tr>
<tr>
<td>41-60</td>
<td>78</td>
</tr>
<tr>
<td>61+</td>
<td>48</td>
</tr>
</tbody>
</table>
Research Dissemination

Presenting data in charts - histogram
Research Dissemination

- Presenting data in charts - box and whiskers plot
Research Dissemination

Presenting data in charts - scatter diagram

State mean SAT score vs Percent taking SAT for 2002
## Research Dissemination

### Presenting data in charts

<table>
<thead>
<tr>
<th>Type of data</th>
<th>Goal of chart</th>
<th>Best chart types</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parts of whole</td>
<td>Show relative size of components of whole</td>
<td>Pie chart (when few parts)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bar chart</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Line chart</td>
</tr>
<tr>
<td>Relative amounts</td>
<td>Show ranking by size, count, percentage, etc.</td>
<td>Bar chart</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Line chart</td>
</tr>
<tr>
<td>Frequency</td>
<td>Show frequency distributions for defined intervals</td>
<td>Histogram</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Line chart</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Box and whisker plot</td>
</tr>
<tr>
<td>Time series</td>
<td>Show variation over time</td>
<td>Bar chart (when few intervals)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Line chart</td>
</tr>
<tr>
<td>Correlation</td>
<td>Show how changes in variables correspond to each other</td>
<td>Paired bar chart</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Line chart</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Scatter diagram</td>
</tr>
</tbody>
</table>