Mixed Up about Mixed Methods? An Overview of Mixed Methods Research Designs

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Rationale of Presentation

• Provide overview of mixed methods
  – Philosophical foundation
  – Research designs
  – Examples from our work
• Encourage broader use of the design

Creswell & Plano Clark, 2010
What and Why?

<table>
<thead>
<tr>
<th>What is mixed methods?</th>
<th>Why use mixed methods?</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Study that includes qualitative and quantitative research designs*</td>
<td>• Combined approach provides a better understanding of the research problem than a single approach</td>
</tr>
<tr>
<td>• Single study or serial design</td>
<td></td>
</tr>
</tbody>
</table>

*NOT just qualitative and quantitative data!
Philosophy

Worldview influences personal choices in research

- Postpositivism
- Constructivism
- Advocacy / Participatory
- Pragmatism

Quantitative
Qualitative
Mixed
Designs: Explanatory and Exploratory

**Quantitative data collection and analysis** → **Qualitative data collection and analysis** → Interpretation

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Design: Exploratory Example

Topic: To what extent do individuals agree with climate change skeptic messages?

Qualitative data collection and analysis → Quantitative data collection and analysis → Interpretation

- Naïve scientific & non-scientific statements
- Sophisticated scientific statements
- “Mother nature” statements
- ACC is beneficial for nature and mankind
- Recent changes are part of a cycle

For more: Bentley et al., Tuesday, 9:50 am
Design: Embedded

**QUANTITATIVE data collection and analysis**

**Qualitative data collection and analysis**

Interpretation based on QUANT
**Design: Embedded Example**

**Topic: Does a field course improve concepts of lake systems?**

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**Significant learning gains in content are likely connected to the service learning aspect of this course.**

Instead of just writing up a report and getting graded on it and then it just gets recycled, ... It added more to [the class] to be able to say, “Okay this is an actual presentation [to the community].” (SF10-01)

Koretsky et al., 2012
Design: Triangulation

Quantitative data collection and analysis

Qualitative data collection and analysis

Compare or relate

Interpretation
Design: Triangulation Example

Topic: Does participation in professional development improve participants' teaching practices?

Quantitative
• Survey data from students
• Statistical analysis

Qualitative
• Interviews with faculty participants
• Qualitative analysis

Compare or relate

Interpretation
Participants who reported challenges in changing their teaching (QL), had lower student engagement scores (QN).

Reid, Sexton, Orsi, 2015
Some studies may appear to be mixed methods, but may not actually be

Qualitative data collection & analysis

Converted to quantitative data for analysis

Interpretation

Industry and academic geologists sometimes sketch differently

<table>
<thead>
<tr>
<th>Sketch or Annotation Type</th>
<th>IndGeo (%) k=183</th>
<th>AcGeo (%) k=149</th>
<th>χ² Statistic (2, K=361)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Landscape (actual)</td>
<td>30.1</td>
<td>26.8</td>
<td>14.27, p &lt; .01</td>
</tr>
<tr>
<td>Fault symbols</td>
<td>49.7</td>
<td>48.3</td>
<td>16.19, p &lt; .01</td>
</tr>
<tr>
<td>Related sketches</td>
<td>36.1</td>
<td>48.3</td>
<td>9.99, p &lt; .01</td>
</tr>
<tr>
<td>Edits or alternates</td>
<td>30.1</td>
<td>16.8</td>
<td>12.74, p &lt; .01</td>
</tr>
<tr>
<td>Explain thinking</td>
<td>42.6</td>
<td>34.9</td>
<td>14.08, p &lt; .01</td>
</tr>
</tbody>
</table>

361 sketches

Petcovic et al., 2016 in press
Is this embedded or triangulation?
Study: Why do students select a geoscience major?

**QUANTITATIVE**
- Close-ended survey data
- Multiple regression analysis

**QUALITATIVE**
- Interviews with students
- Constant comparative analysis

**OPTIONS**
- Embedded
- Triangulation
Conclusion

• Mixed method research can be a powerful tool
  – Yields greater insight than a single approach study
  – Overcomes limitations of a single approach

• Is mixing for you? Consider your:
  – Worldview
  – Research question / purpose
  – Comfort and familiarity with both qualitative and quantitative designs/methods
Questions?

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