

Applications of Mixed Methods Research in Education

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Webinar hosted by IIQM/MMIRA
9 May 2017
tinyurl.com/App1-MMR-Ed

Today's Plan

- What do we know about quantitative and qualitative research?
- What is "mixed methods research" (MMR)?
- Case study of 3 exemplars
- Affordances and challenges to MMR in educational research
- Questions and Quandaries

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What do we know about quantitative and qualitative research?

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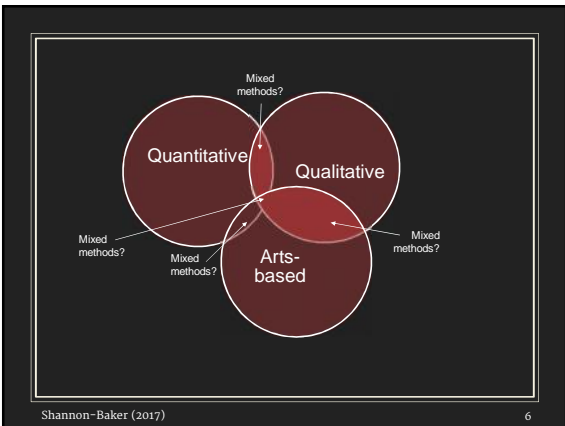
Characteristics of Research (Hatch, 2002)

<p>Quantitative research?</p> <ul style="list-style-type: none">• Controlled or manipulated settings• Researcher-defined perspective• Objective measures of variables• Researcher remains objective, collects data• "Facts" and causal explanations are very important• Narrow set of variables• Objectivity• <i>A priori</i> fixed design• Deductive data analysis• Researcher remains impartial	<p>Qualitative research?</p> <ul style="list-style-type: none">• Natural settings• Participant perspectives• Researcher as data-gathering instrument• Extended first-hand engagement• Centrality of meaning is very important• Wholeness and complexity• Subjectivity• Emergent design• Inductive data analysis• Reflexivity; researcher plays an active role
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What is "mixed methods research"?

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My Definition of MMR (Shannon-Baker, 2015, 2016)

- Philosophically grounded, intentional
- Multiple approaches in a single study
 - Multiple approaches v. "both" approaches (quan and qual)
- Mixture at any stage (data collection, analysis, writeup)

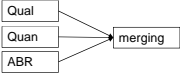
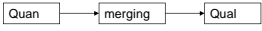

Creswell and Plano Clark (2011); Morse and Niehaus (2009)

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The fundamental principle of mixed methods research is built upon the idea that *integrating (or mixing) data and results between approaches will build upon complementary strengths and weaknesses.*

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Approaches to Mixing

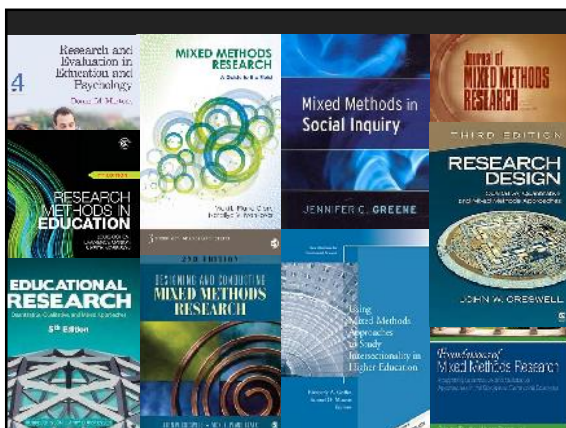
- Merging approaches

- Connecting approaches

- Embedding within a framework


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Integration Strategies

- Data transformation: qualitize and quantize (Treddie & Tashakkori, 2009)
- Extreme case analysis (Caracelli & Greene, 1993)
- Data matrices (or joint displays) (Piano Clark & Sanders, 2015)

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State of MMR in Educational Research

- Google Scholar: 4.34 million "mixed methods research education"
- Grants (USA: IES, Spencer Foundation, NIH, NSF)
- Graduate coursework (Degree programs/courses in education)
- Conferences and conference presentations

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State of MMR in Educational Research

Less specific to education

- Associations ([Mixed Methods Int'l Research Association](#), [American Educational Research Assoc.](#), [MM Special Interest Group](#), etc.)
- Journals ([Journal of Mixed Methods Research](#), [International Journal of Multiple Research Approaches](#))

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3 Exemplars of Mixed Methods in Education

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Criteria to Consider in MMR (Johnson et al., 2007)

1. What is mixed during the process?
2. When does the mixing occur?
3. What is within the realm of "mixed" methods research?
4. Why is the mixing important?
5. How does one's paradigmatic "orientation" influence the inquiry (e.g. "bottom-up" versus "top-down") (p. 122)?

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Evaluating a Study's Use of MMR (Plano Clark & Ivankova, 2016)

- Do the researchers...
 - Identify their research questions and purpose?
 - Address the timing of their approaches?
 - Discuss how they integrated their approaches/data/results?
 - Discuss their inferences from each approach and/or their meta-inferences?
- Special considerations:
 - Field-based assumptions and expectations
 - Journal/chapter word limits
 - Whether the audience is knowledgeable about MMR

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Ed Psych: Hoffman & Nadelson (2010)

- Problem:** What factors influence video gaming and if their motivation and goal orientations could be transferred to gaming in the classroom
- Methods design:** "concurrent triangulation mixed-methods"

QUAN

+

QUAL

→

Inferences

- N - 189
- 4 Instruments: Video Game Play, Goals Inventory, Need for Cognition, Success for Gaming Scale
- T-tests, regression analysis
- N - 25 (purposeful subset)
- Interview
- 3 phase coding: *a priori* categories; based on participants' motivations; thematic
- Merged analysis discussion
- Gaming satisfied need to socialize
- Control and challenge were associated with engagement
- Games may only aid learning if directly connected to content

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Ed Psych: Hoffman & Nadelson (2010)

- Clearly connect their philosophical orientation
- Detailed qualitative coding procedures
- Qualitative sampling based on sub-set of self-selected volunteers from quantitative surveys
- Triangulation focus → focus on supportive findings

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ELL: Soto Huerta (2012)

- **Problem:** Need to understand relationship between high-stakes test scores for emergent bilinguals and their literacy development strategies
- **Methods design:** "sequential MMR design"

Quan	QUAL	Inferences
<ul style="list-style-type: none"> • N= 45 Spanish/English 4th graders • Texas standard test: Informal Reading Inventory • Descriptive statistics (scores, sd) 	<ul style="list-style-type: none"> • <i>Quan scores used to identify strategies for qual activities</i> • Interview; guided reading activities; field notes • Inductive coding • 3 themes: comprehension, vocab, using both languages 	<ul style="list-style-type: none"> • Guided reading improved comprehension, and demonstrate other knowledges • Earlier learners req'd modeling, passage preview, and rehearsals

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ELL: Soto Huerta (2012)

- Qualitative data helped participants to "voice" their experiences
- Using IRI and qualitative measures created greater understanding of their English literacy development
- *Connection between phases not as clear*
- *Small sample size and convenience sampling*

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C&I: Rule & Harrell (2006)

- **Problem:** Anxieties about math influence choice to become math teachers and carry on to students
- **Methods design:** "triangulation mixed methods"; pre-/post-test of influence of math methods course ($n = 47$)

Arts-based & Qual	Quantified Data	Inferences
<ul style="list-style-type: none"> • Drawings of math-related experiences • Written account of related emotions • Interviews 	<ul style="list-style-type: none"> • Descriptive statistics (frequency of images and themes) • Two-proportion z-test for change 	<ul style="list-style-type: none"> • More positive emotions and less negative emotions depicted • Conscious reflections help to change attitudes toward math

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C&I: Rule & Harrell (2006)

- *Did not have a separate quantitative data collection*
- Strong psychological grounding, especially for arts-based methods
- Drawings...
 - Helped to change negative math anxieties (with course)
 - Encouraged reflection on past
 - Made them more aware of their feelings about math
- Drawing activities and conscious reflection about math-related experiences and emotions should be added to methods courses

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Affordances & Challenges to MMR in Education

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Affordances

- Findings can "speak" to one another—qualitative data to speak to high-stakes tests (Soto Huerta, 2012)
- Refute commonly held beliefs (Hoffman & Nadelson, 2010)
- Add depth to analyses of other data (Shannon-Baker, 2015)
- Based on definition/rationale for MMR:
 - More "fully" or completely address question/phenomenon
 - More "justifiable" results (Plano Clark & Ivankova, 2016, p. 6)
 - Build on the strengths and weaknesses of multiple approaches (Buck et al., 2009)
 - Instrument fidelity (Collins, Onwuegbuzie & Sutton, 2006)

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Challenges

- What constitutes "mixed" methods research (e.g. Rule & Harrell, 2006)
- Clear elaboration of methods and mixing/integration
- Consider the audience
- More funding → more "mixed methods" but do they mix?
- Training in multiple approaches to implement appropriate studies
- Supportive mentors

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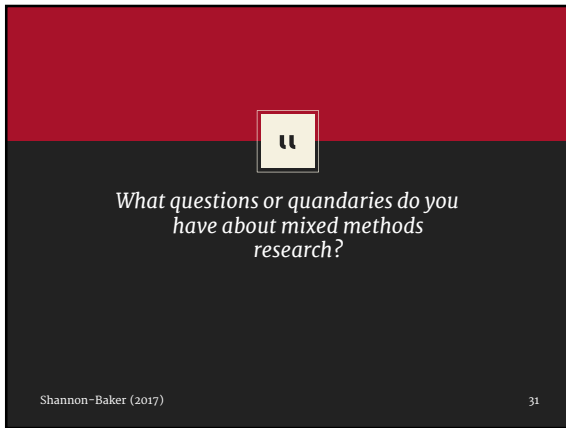
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Shannon-Baker (2017) 29

Thank you!

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What questions or quandaries do you have about mixed methods research?

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