

Getting Started in GER

STUDY DESIGN: QUALITATIVE VS. QUANTITATIVE



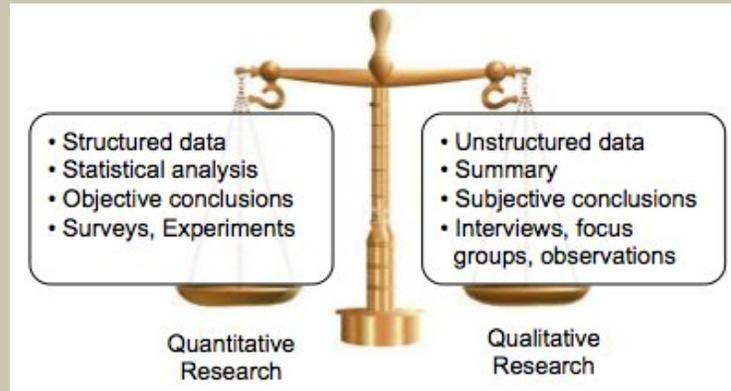
Earth Educators'
Rendevous

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OUTLINE

- Review Qualitative and Quantitative
- Mixed Methods
- An example of mixed methods in action

QUANTITATIVE VS. QUALITATIVE



<http://www.mymarketresearchmethods.com/quantitative-vs-qualitative-research-whatsthe-difference/>

Advantages and disadvantages of each?

WHY QUANTITATIVE?

Broad	General	Large n
Objective	Well established	Few variables
Reliable	Comparable	Less bias
Replicable		Statistics

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WHY QUALITATIVE?

Detailed

Realistic

Rich

Descriptive

Unstructured

Interactive

Original

Robust

Flexible

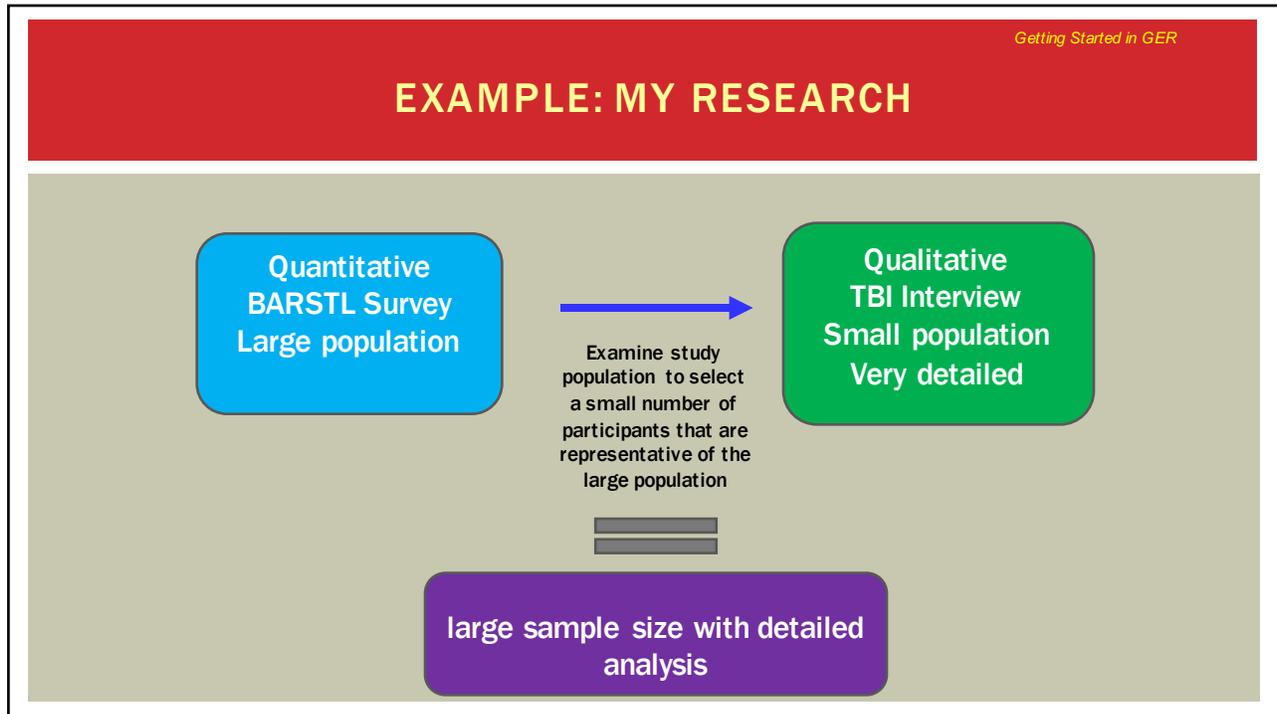
COMPARING INQUIRY STRATEGIES

Table 1.2 Alternative Strategies of Inquiry

<i>Quantitative</i>	<i>Qualitative</i>	<i>Mixed Methods</i>
Experimental designs Non-experimental designs, such as surveys	Narratives Phenomenologies Ethnographies Grounded theory Case studies	Sequential Concurrent Transformative

Creswell, J.W. (2003). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (2nd Edition). Thousand Oaks, CA: Sage.

Mixed Methods permits moving between phases of a research study using qualitative data to inform quantitative instruments or to identify variables (or vice versa!)



QUANT TOOL: BARSTL: BELIEFS ABOUT REFORMED SCIENCE TEACHING AND LEARNING SURVEY

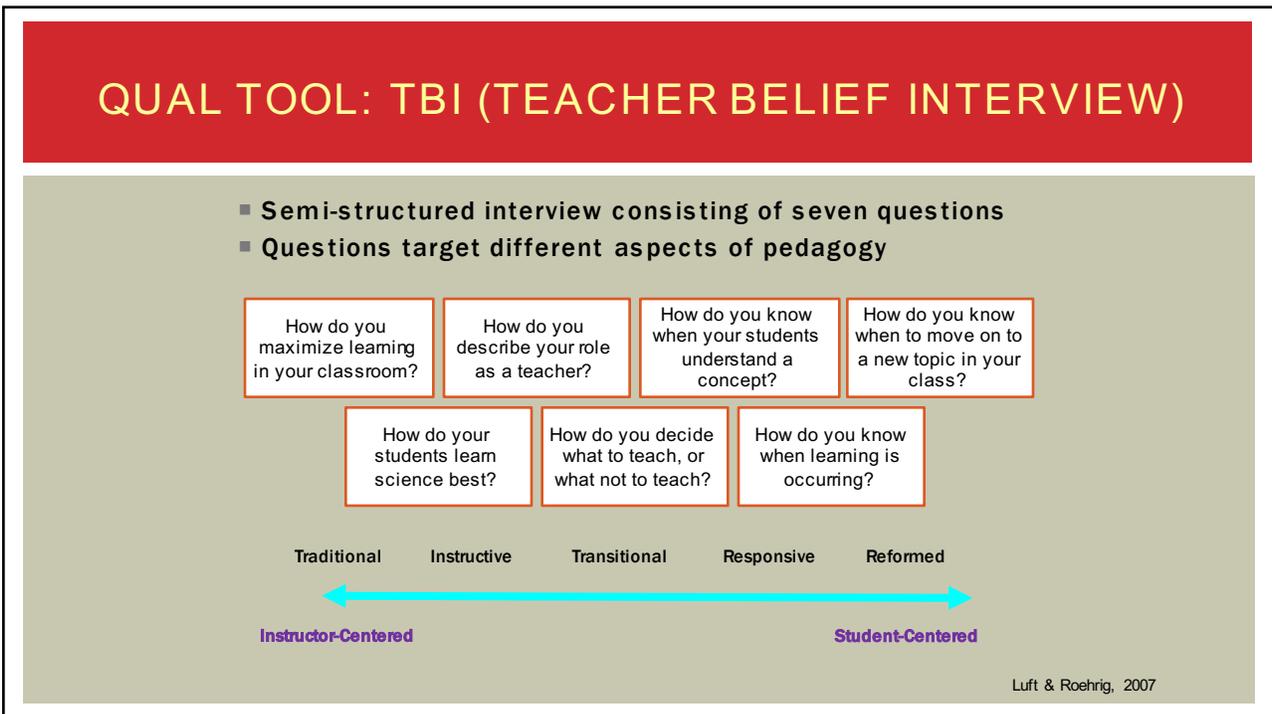
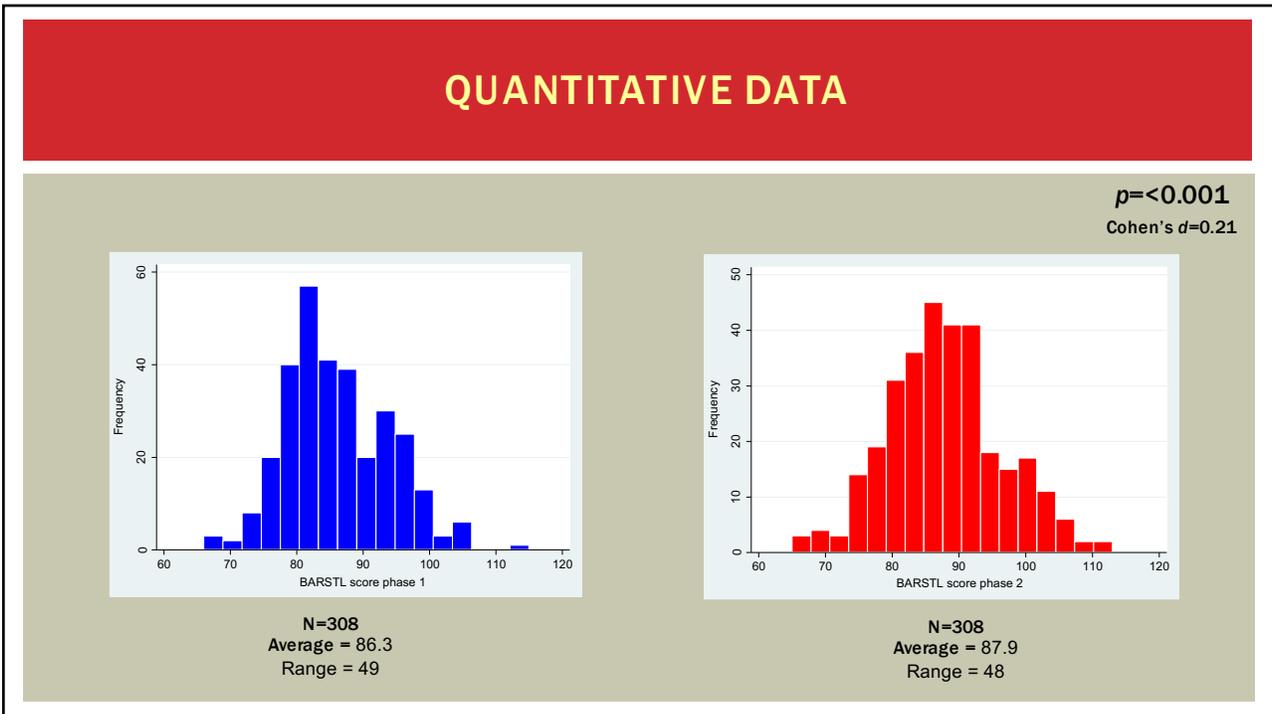
- 32-item Likert-type questionnaire; participants select their degree of agreement with the statements

During a lesson, students need to be given opportunities to test, debate and challenge ideas with their peers.

1: Strongly Disagree 2: Disagree 3: Agree 4: Strongly Agree

- Possible scores: 32 - 128 points, with higher scores reflecting reformed, student-centered beliefs

Sampson et al., 2013



Example interview question: How do you know when your students understand a concept in class?

Ideally, when they can explain it back to you or explain it back to somebody else in their own words.

That's what we did in tutoring a lot – that was if someone, especially in group tutoring if somebody answered a question, and other people were just sitting there.

We'd always have them go around and each explain in their own words before we'd move on to the next topic.



Instructive

In later classes, if someone brings up a topic again or maybe emails you later to ask about it, I would say that that would show they understood.

And of course, on tests and stuff, if they perform well, then I would take that as a measure of their understanding as well.

Asking a specific question like, "Okay, if relative humidity increases as air rises, then that would mean it decreases when it sinks," they're kind of like twisting the question around and furthering their understanding of the concept, that kind of thing.



Responsive

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YOUR TURN

- Take a moment to brainstorm and jot down potential qualitative geood research questions for undergraduate students.
- Discuss with your neighbor.
- Will your research study be qualitative, quantitative, or mixed methods? Write down any ideas on your worksheet.