

MIXED METHODS



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Overview

- Mixed Methods Research, Defined
- Quantitative Research
- Qualitative Research
- When to use Mixed Methods Research
- Types of Mixed Methods Research Designs
- Key Characteristics
- Steps in Conducting a Mixed Methods study
- Evaluating a Mixed Methods study

Mixed Methods Research, Defined

- A mixed methods research design is a procedure for collecting, analyzing, and “mixing” both quantitative and qualitative research and methods in a single study to understand a research problem.
- To utilize this design effectively, you must understand *both* quantitative and qualitative research.
- Philosophical Approaches

Quantitative Research

- A type of educational research in which the researcher decides what to study; asks specific, narrow questions, collects quantifiable data from participants (a large number of participants); analyzes these numbers using statistics; and conducts the inquiry in an unbiased, objective manner.
- Postpositivism – singular reality; objective; deductive

Quantitative Research (cont'd)

- Generally attempts to quantify variables of interest; questions must be measurable.
- Example:
 - What is the relationship between graduate students' level of interaction, measured by the number of 'hits' in the course, and students' grades in an online research methods course?

Quantitative Methodology

- Generally involves collecting numerical data that can be subjected to statistical analysis
- Examples of data collection methodologies
 - Performance Tests
 - Personality Measures
 - Questionnaires (with closed-ended questions or open-ended but transferred to quan data)
 - Content Analysis
- The data is generally referred to as “hard” data

Qualitative Research

- A type of educational research in which the researcher relies on the views of participants; asks broad, general questions; collects data consisting largely of words (or text) from participants; describes and analyzes these words for themes; and conducts the inquiry in a subjective, biased manner.
- Constructivism – multiple realities; biased; inductive

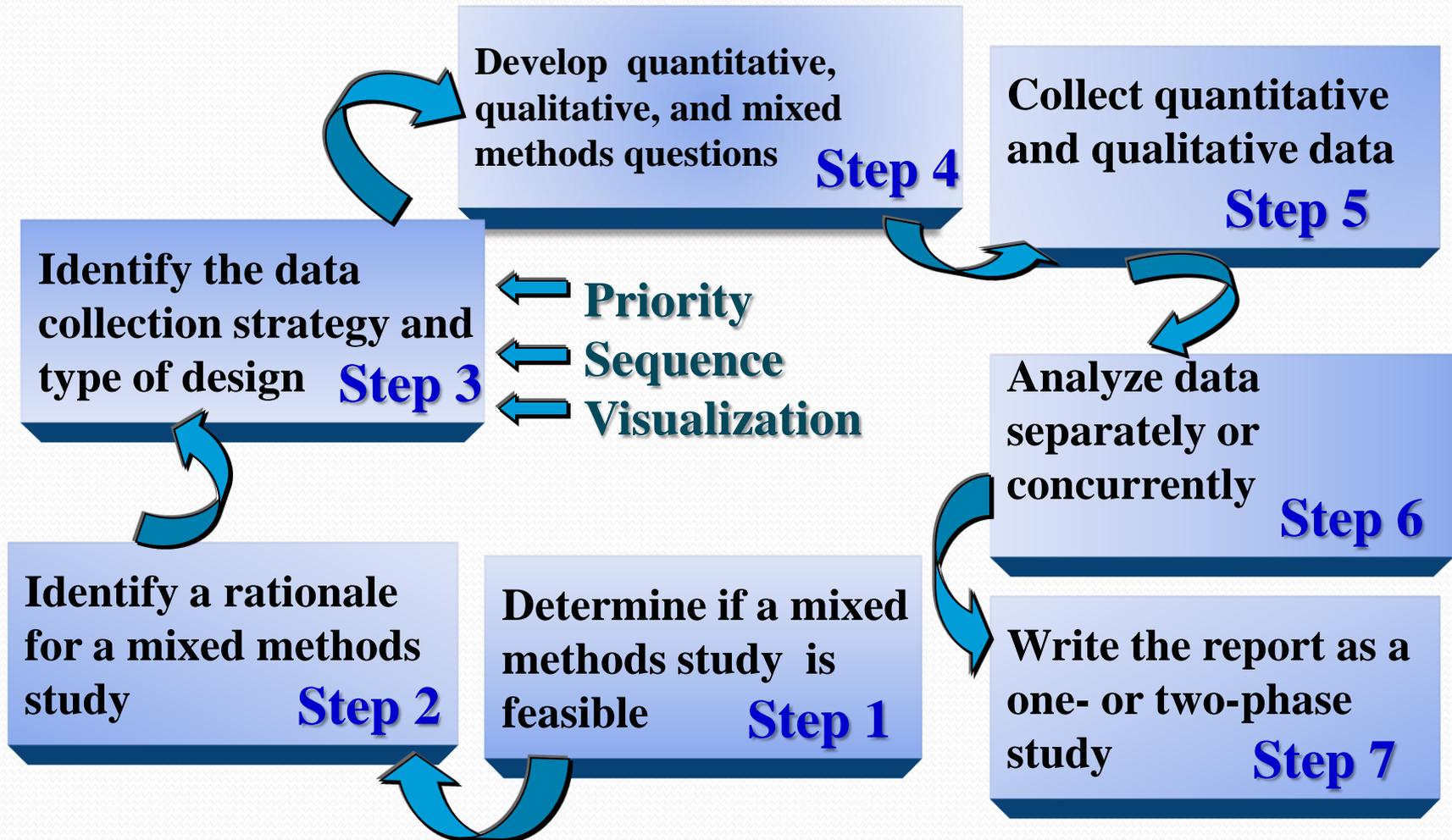
Qualitative Research (cont'd)

- “There are times we wish to know not how many or how well, but simply how” (Shulman, 1988, p. 7).
- Example:
 - “What are the factors that influence a graduate students’ experience in an online research methods course?”

Qualitative Methodology

- Generally involves listening to the participants' voice and subjecting the data to analytic induction (e.g., finding common themes)
- More Exploratory in nature
- Examples of data collection methods
 - Interviews
 - Open-ended questionnaires
 - Observations
 - Content analysis
 - Focus Groups

Steps for Conducting a Mixed Methods Study



When to Use Mixed Methods Designs

- When both quantitative and qualitative data, together, provide a better understanding of your research problem than either type by itself.
- When one type of research (qualitative or quantitative) is not enough to address the research problem or answer the research questions.
- Pragmatism – practicality; multiple view points; biased and unbiased; subjective and objective

When to Use Mixed Methods (cont'd)

- To incorporate a qualitative component into an otherwise quantitative study
- To build from one phase of a study to another
 - Explore qualitatively then develop an instrument
 - Follow-up a quantitative study qualitatively to obtain more detailed information

Mixed Methods Research Methodology

- Utilizes both quantitative and qualitative data collection methodologies.
- Examples
 - Interviews and Questionnaires
 - Performance Tests and Observation
 - Questionnaires and follow up Focus groups
 - Document analysis, Performance Tests, Questionnaire, and Interviews

What Is Mixed Methods Research?

A **mixed methods research design** is a procedure for collecting, analyzing, and “mixing” both quantitative and qualitative research and methods in a single study to understand a research problem.

Key Characteristics of Mixed Methods Designs: Rationale

- Rationale
 - Test findings of first phase
 - Explain results of first phase in more detail
 - Provide a more complete understanding than either quantitative or qualitative alone
- Collecting both quantitative and qualitative data
 - Numeric data
 - Text data

Mixed Methods Legend

Notation	Defined
QUAN	Quantitatively driven study.
QUAL	Qualitatively driven study.
quan	Quantitative data is secondary to <i>qualitative</i> data.
qual	Qualitative data is secondary to <i>quantitative</i> data.
+	Indicates that quantitative and qualitative data are collected <i>concurrently</i>.
→	Indicates that quantitative and qualitative data are collected <i>sequentially</i>.

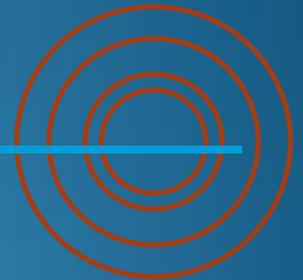
Key Characteristics of Mixed Methods Designs: Priority and Sequence

- Priority
 - Equal weight
 - **QUAN** carries more weight than **qual**
 - **QUAL** carries more weight than **quan**
- Sequence
 - Collect both quantitative and qualitative data at the same time
 - Collect quantitative data first, followed by qualitative data
 - Collect qualitative data first, followed by quantitative data

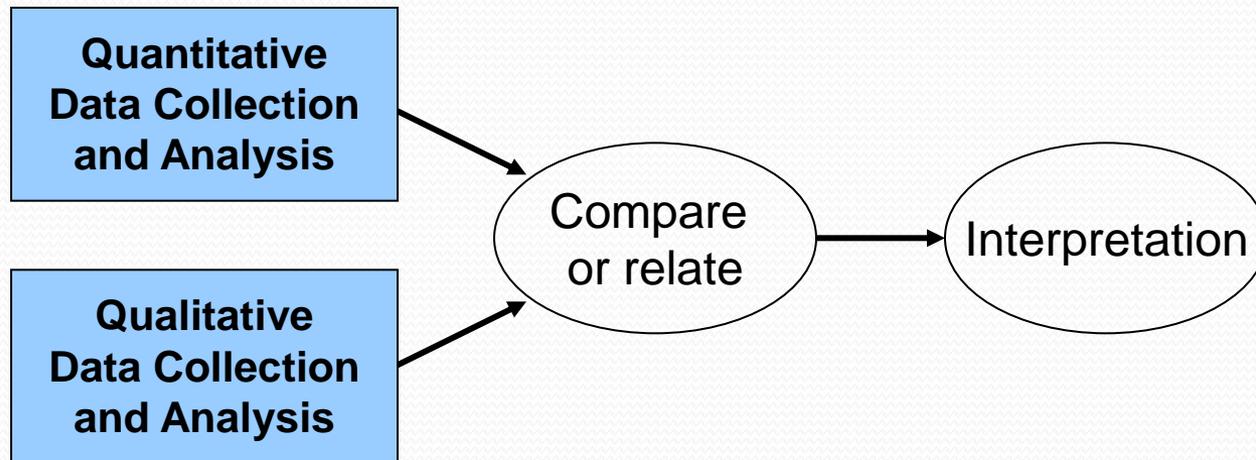
Key Decisions In Choosing A Mixed Methods Study

- The level of interaction between the quantitative and qualitative strands
- The priority of the strands
- The timing of the strands
- Where and how to mix the strands

The Major Mixed Methods Designs



The Convergent Parallel Design



The Convergent Design

- The researcher:
 - Collects quantitative and qualitative data concurrently
 - Analyzes the two data sets separately
 - Mixes the two databases by merging the results during interpretation (and sometimes during data analysis)

Purposes for the Convergent Design

- Obtain a more complete understanding from two databases
- Corroborate results from different methods
- Compare multiple levels within a system

When to Use the Convergent Design

- Choose this design if:
 - Need to collect both types of data in one visit to the field
 - Both types of data have equal value for understanding the research problem
 - Have quantitative and qualitative research skills
 - Can manage extensive data collection activities individually or with a team

Convergent Design

- Philosophical assumptions:
 - Best suited to an "umbrella" paradigm such as pragmatism
- Common variants:
 - Parallel-databases variant
 - Data-transformation variant
 - Data-validation variant

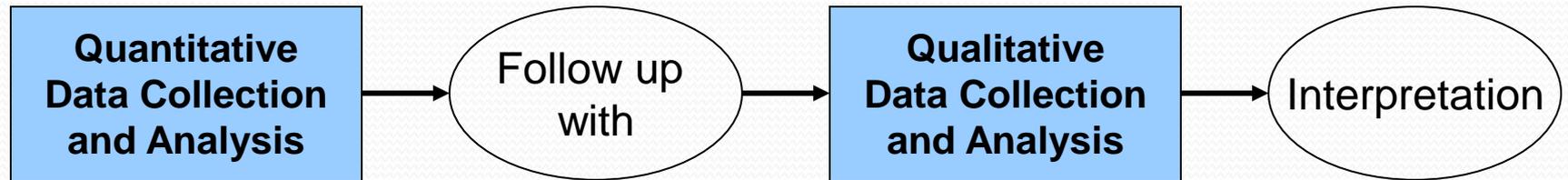
Strengths: Convergent Design

- Intuitive
- Efficient
- Lends itself to teams

Challenges: Convergent Design

- Requires substantial effort and expertise
- Issues related to the samples and sample sizes
- Difficult to converge two sets of different data
- How to resolve discrepant results

The Explanatory Sequential Design



The Explanatory Design

- The researcher:
 - Starts by collecting and analyzing quantitative data
 - Collects and analyzes qualitative data in a second phase as a follow-up to the quantitative results
 - Connects the phases by using the quantitative results to shape the qualitative research questions, sampling, and data collection

Purposes for the Explanatory Design

- To use qualitative data to help explain quantitative results that need further exploration
- To use quantitative results to purposefully select best participants for qualitative study

When to Use the Explanatory Design

- Choose this design if:
 - Researcher and research problem are quantitatively oriented
 - Know important variables and instruments are available
 - Participants available for second data collection
 - Have time to conduct two phases
 - Have limited resources and need to collect and analyze one data type at a time
 - New questions emerge from quantitative results

Explanatory Design

- Philosophical assumptions:
 - Begin from postpositivism for the quantitative phase
 - Shift to constructivism for the qualitative phase
- Common variants:
 - Follow-up explanations variant
 - Participant-selection variant

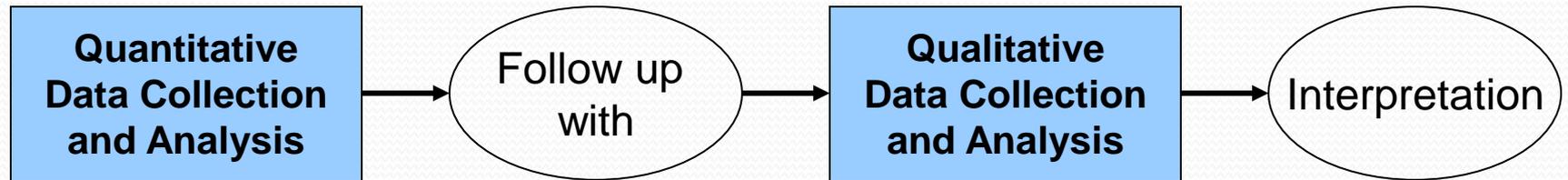
Strengths: Explanatory Design

- Appealing to quantitative researchers
- Straightforward to implement two phases
- Final report can be written in two phases
- Lends itself to emergent approaches

Challenges: Explanatory Design

- Two phases require lengthy time to implement
- Difficult to secure IRB approval when second phase cannot be specified before first phase complete
- Need to decide what results to follow up
- Must decide criteria for selecting participants
- Need to contact participants for a second round of data collection

The Exploratory Sequential Design



The Exploratory Design

- The researcher:
 - Collects and analyzes qualitative data first followed by quantitative data
 - Analyzes the qualitative data and uses results to build to the subsequent quantitative phase
 - Connects the phases by using the qualitative results to shape the quantitative phase by specifying research questions and variables, developing an instrument, and/or generating a typology

Purposes for the Exploratory Design

- To first explore because variables, theories, hypotheses not known
- To develop an instrument or typology that is not available
- To assess whether qualitative themes generalize to a population

When to Use the Exploratory Design

- Choose this design if:
 - Researcher and research problem are qualitatively oriented
 - Important variables not known and instruments not available
 - Have time to conduct two phases
 - Have limited resources and need to collect and analyze one data type at a time
 - New questions have emerged from qualitative results

Exploratory Design

- Philosophical assumptions:
 - Begin from constructivism for the qualitative phase
 - Shift to postpositivism for the quantitative phase
- Common variants:
 - Theory-development variant
 - Instrument-development variant

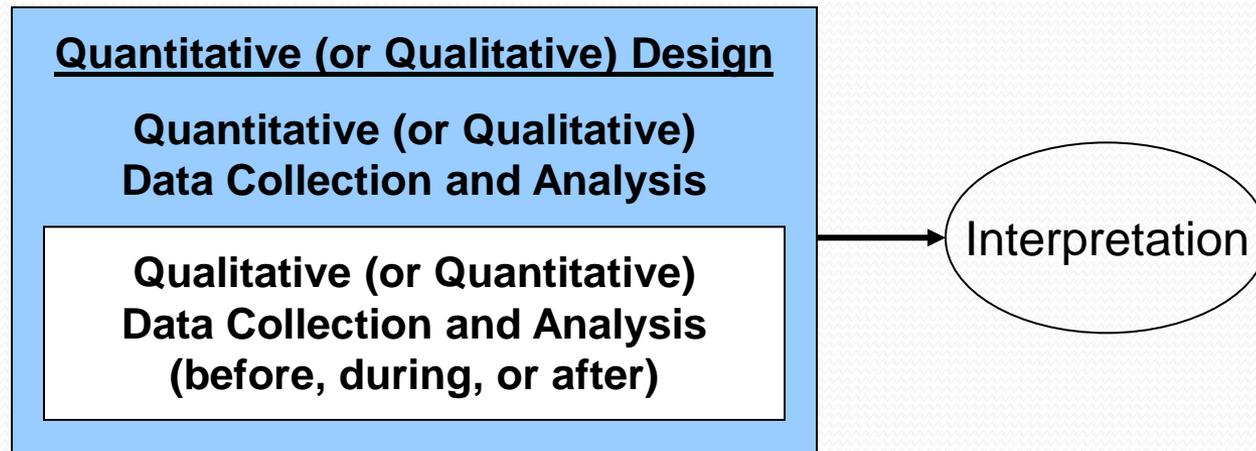
Strengths: Exploratory Design

- Straightforward to design, implement, and report
- Quantitative component can make the qualitative approach more acceptable to quantitative-biased audiences
- Researcher produces a product, such as an instrument
- Lends itself to emergent approaches

Challenges: Exploratory Design

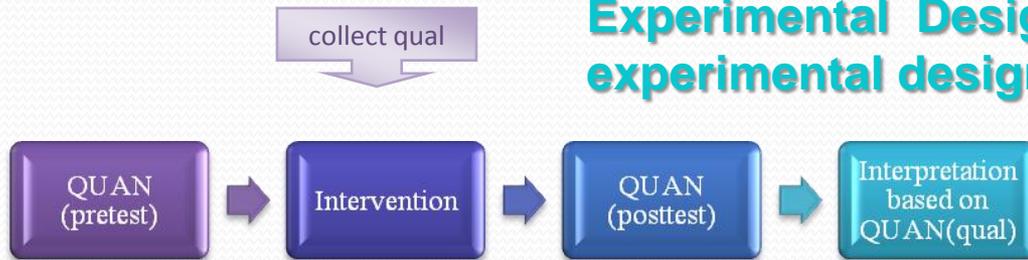
- Two phases require lengthy time to implement
- Difficult to specify quantitative procedures when applying for initial IRB approval; may have to apply twice
- Deciding the qualitative findings to use for quantitative phase
- Procedures for developing a valid and reliable instrument

The Embedded Design



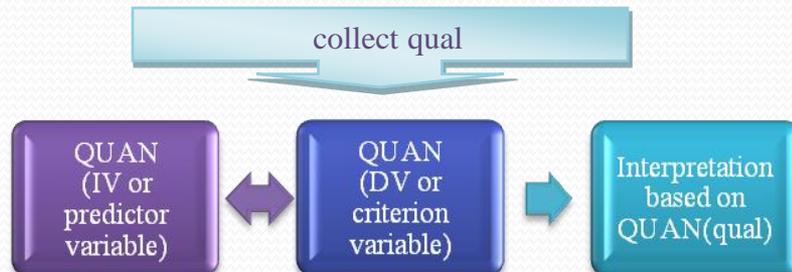
Embedded Approach

Experimental Design (can use quasi-experimental design)



QUAN designs to be used within an Embedded Approach

Correlational	Experimental
Explanatory design	Between-subjects -pre- and posttest design
Predictive design	Within-subjects -cross-over design -factorial design



Correlational Design

The Embedded Design

- The researcher:
 - Collects and analyzes quantitative and qualitative data within a quantitative research design, qualitative research design, or research procedure
 - Collection and analysis of secondary data set occurs before, during, and/or after the primary methods

Purposes for the Embedded Design

- To address different questions that call for different methods
- To enhance an experiment such as by
 - improving recruitment procedures
 - examining the intervention process
 - explaining reactions to participation

When to Use the Embedded Design

- Choose this design if:
 - Have expertise with the primary design
 - Are comfortable with the primary orientation
 - Have little prior experience with the supplemental method
 - Resources limit placing equal priority on both methods
 - Need for a secondary data set emerges

Embedded Design

- Philosophical assumptions:
 - Worldview may reflect the primary approach, use pragmatism for a concurrent approach, or shift in a sequential approach
- Common variants:
 - Embedded experiment
 - Embedded correlational
 - Embedded instrument development and validation
 - Mixed methods case study
 - Mixed methods narrative research
 - Mixed methods ethnography

Strengths: Embedded Design

- May require less time and fewer resources
- Improve the larger design with supplemental data
- Fits team approach well
- May be able to publish results separately
- Appealing to those accustomed to traditional designs

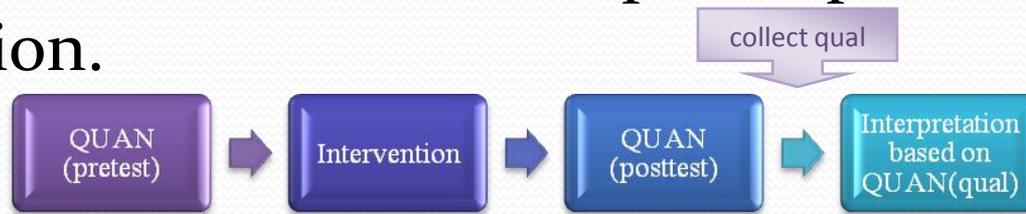
Challenges: Embedded Design

- Need expertise in primary design and mixed methods
- Must specify purpose for collecting the supplemental data
- Must decide when to collect supplemental data
- Results are difficult to integrate
- Must consider treatment bias if qualitative data collected during experiment

Light, G. et al. (2009). Assessing the impact of a year-long faculty development program on faculty approaches to teaching. *International Journal of Teaching and Learning in Higher Education*, 20(2), 168-181.

- **Objective:** Determine if the Faculty Development Program (FDP) impacts teaching style of pre-tenure faculty.
- **Research Questions**
 - **Quantitative** – What effect did the FDP have on teachers' approaches to teaching?
 - **Qualitative** – (*Central*) – How did the teachers' teaching strategies change in response to the FDP?
 - *Sub* - What steps did the teachers take to implement the change?
 - **Mixed Method** – How do the qualitative (qual) findings explain (expand on) the quantitative (QUAN) results?

- Design.** The mixed method design employed was an explanatory approach with an quasi-experimental design. The quantitative method was quasi-experimental between-subjects approach utilizing a pre- and posttest control group design. Qualitative data was collected at two time points post intervention.



Assignment	N = 81	Pretest	Treatment	Posttest	qual	qual (n = 25)
NR	n = 52	ATI	FDP	ATI	Critical Reports	Interviews
NR	n = 29	ATI	-	ATI	Critical Reports	

NR = non-random

ATI = Approach to Teaching Inventory

FDP = Faculty Development Program

Chapter 1: Introduction

- Statement of the Problem
 - The topic.
 - The research problem.
 - Background and justification (philosophical view points).
 - Deficiencies in the evidence.
 - Audience.
- Definition of Terms

Chapter 2: Literature Review

- Lit Review should include relevant headings and subheadings. Following the lit review the purpose statement then research questions should be presented.
- Purpose Statement -(a) the overall content aim, (b) the type of mixed method design, (c) the forms of data collection that will be used (very general), (d) the data collection site(s), and (e) the reason for collecting both forms of data (see Creswell, 2007).
- Research Questions
 - Quantitative
 - Qualitative
 - Mixed Methods

Chapter 3: Methodology

- Participants
 - Quantitative.
 - Qualitative.
- Instruments
- Procedures
 - Design
 - Quantitative data.
 - Qualitative data.
 - Data analysis.
- Limitations

Mixed Methods Template

- Go to the ARC website for the Mixed Methods specific template:

http://www.fischlerschool.nova.edu/applied-research/procedures_and_resources

Thank you for your Attention!

