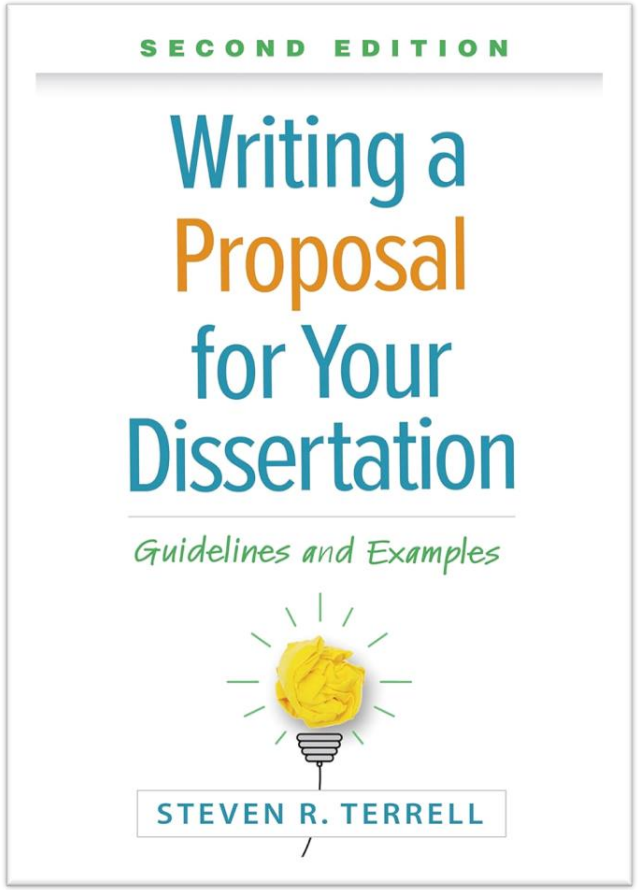
Selecting an Appropriate Methodology for Your Dissertation



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The Problem Statement Leads to the Methodology

Note: Problem Solving Methodologies

- Developmental (i.e., Research and Development)
  - Action-oriented research where a technique or tool is developed to be used. Examples include new curriculums, computer programs, texts, training programs, etc.
- Evaluative
  - Action-oriented research where new tools or techniques are evaluated to test their feasibility or efficacy in an educational setting. Studies of this type can be used to evaluate results of a developmental study.

Quantitative Research

- Deductive by nature (tests a hypothesis based on a theory)
- Hypotheses and research procedures stated prior to starting the study
- Numeric data is collected and analyzed
- Cause and effect is examined
- Descriptive and inferential statistical procedures are use to test the hypotheses
- “We live in a stable and predictable world that we can measure, understand and generalize about” (Gay, Mills and Airasian, 2009)

Common Quantitative Approaches

- Survey Studies
  - These studies are used to examine current status of something. Common types are cross-sectional and longitudinal.
- Relationship Studies
  - These studies explain how events or things are related to one another. Common types are correlational studies and causal-comparative studies.
- Experimental research
  - These studies are used to examine cause-and-effect and work by examining the effect of independent variables (i.e., the cause) on dependent variables (i.e., the effect). The three major types of experimental research are pre-experimental designs, quasi-experimental designs and true experimental designs.

Survey Studies

- Used to understand and explain current events
- There are many, many different types of descriptive studies including opinion/fact and cross-sectional.
- Sample selection and data collection are critical
- Since new data is collected it is often necessary to develop new data collection tools (instrumentation)
- Data may be collected via self-report or observation
- Cause and effect is not stringently tested but can be implied

Relationship: Correlational Studies

- Data are collected for two or more variables to determine if a relationship exists between the variables
- The relationship is expressed as a correlation coefficient
- Coefficients range from –1.00 to +1.00
  - A negative coefficient implies an inverse relationship
  - A positive coefficient implies a positive relationship
  - A coefficient of zero indicates no relationship
- Correlations do not demonstrate causality but can be used for prediction or inference

Relationship: Causal-Comparative Studies

Two or more different levels of an existing independent variable are measured using a dependent variable. For example, the achievement (dependent variable) of students in self-contained classrooms (level of an independent variable called “classroom type”) is compared against the achievement of students in open classrooms (another level of the same independent variable “classroom type”).

Because there is no pre-test to establish initial equivalency and neither treatment or group membership is randomly assigned, this does not test cause and effect but inferences can be made. The best inferences are made when the groups being measured are approximately equal on all factors that might affect the dependent variable other than the one in question.

Some notes on nomenclature…

- We will use “shorthand” to describe the experimental designs
- X will always be a level of the independent variable
- O will always be an point where data is collected about the dependent variable
- R will indicate that random assignment has taken place
- Numbers will be used to identify treatments to different groups

For example, suppose we have the following hypothesis…

Children receiving tutoring will do better in math.

We have an independent variable (type of instruction) with one level (tutoring). The dependent variable is math achievement. We could use the first pre-experimental study (one-shot case study) to investigate the hypothesis. It is annotated as:

X - O

This means we have one treatment followed by one observation. There are problems with this type of study as we will see later.

Types of Experimental Studies

- Pre-experimental designs
  - Lowest degree of control to threats; lowest validity.
- Quasi-experimental designs
- True experimental designs
  - Highest degree of control to threats; highest validity

Pre-experimental designs

One-shot case study

X – O

No control or validity

One-group pre-test / post-test

O – X – O

More control but still not good

Static group comparison

X1 – O

X2 – O

At least two groups

One group is randomly chosen to receive different treatment

No random assignment to groups

Quasi-experimental designs

Non-Equivalent Control Group Design

O – X1 – O
O – X2 – O
Example: existing classrooms

Time-Series Design

OOOOO – X – OOOOOO
Multiple measures before and after intervention

Counter-Balanced Design

X1 – O – X2 – O – X3 – O
X2 – O – X3 – O – X1 – O
X3 – O – X1 – O – X2 - O
All groups receive all treatments but in different order.

Experimental designs

Pre-Test / Post-Test Control Group Design

R – O – X1 – O
R – O – X2 – O

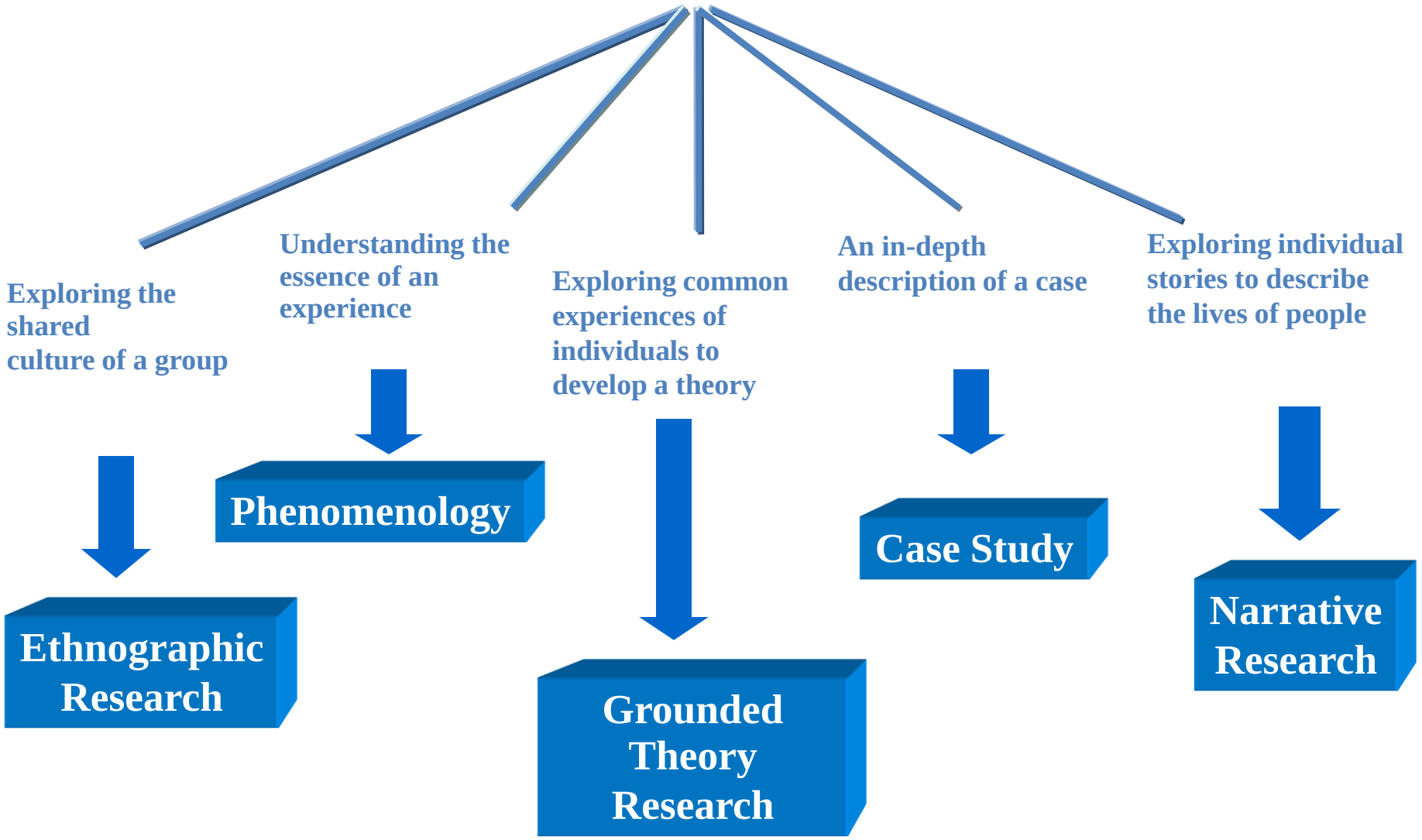
Post-Test Only Control Group Design

R – X1 – O
R – X2 – O

Solomon Four-Group Design

R X1 – O
R X2 – O
R – O – X1 – O
R – O – X2 – O

Common Qualitative Designs and Uses



What is Ethnographic Research?

Qualitative research procedures for describing, analyzing, and interpreting a culture-sharing group's shared patterns of behavior, beliefs, and language that develops over time.

- Focus: Describing and interpreting the shared patterns or culture of the group.
- Type of problem: A need to better understand a given cultural group.
- Discipline background: Anthropology and sociology.
- Unit of analysis: Studying a group that shares the same theme.
- Data collection forms: Uses primarily observations and interviews but perhaps other sources during extended time in the field.
- Data analysis strategies: A description of the culture-sharing group; themes about the group.
- Written report: Describing how the culture-sharing group works.

Adapted from Creswell- Educational Research: Planning, Conducting, and Evaluating Quantitative and Qualitative Research, Third Edition.

What is Phenomenological Research?

A descriptive study of how individuals experience a phenomenon. This is the lived experience but can also include psychological constructs such as grief, anger or love. the descriptive study of how individuals experience a phenomenon

- Focus: Understanding the essence of the experience.
- Type of problem: Needing to describe the essence of the experience.
- Discipline background: Business, philosophy, psychology and education.
- Unit of analysis: One or several individuals who have shared the same experience.
- Data collection forms: Using primarily interviews with individuals although documents, observations, recordings and art may also be used.
- Data analysis strategies: Analyzing data for significant statements, meaning units, textural and structural descriptions, description of the “science”
- Written report: Describing the “essence” of the experience.

Adapted from Creswell- Educational Research: Planning, Conducting, and Evaluating Quantitative and Qualitative Research, Third Edition.

What is Grounded Theory Research?

Grounded theory research enables the development of a *theory* which offers an explanation about a problem experienced by your area of interest and how that problem is resolved or processed.

- Focus: developing a theory grounded in data from the field.
- Type of problem: best suited for investigating problems based on the views of the of participants.
- Discipline background: grounded in sociology.
- Unit of analysis: studying a process, action or interaction involving many individuals.
- Data collection forms: primarily interviews with 20 to 60 individuals.
- Data analysis strategies: open coding, axial coding and selecting coding.
- Written report: generating a theory illustrated in a figure.

Adapted from Creswell- Educational Research: Planning, Conducting, and Evaluating Quantitative and Qualitative Research, Third Edition.

What is Narrative Research?

In narrative research, researchers describe the lives of individuals, collect and tell stories about people's lives, and write narratives of individual experiences. As a distinct form of qualitative research, a narrative typically focuses on studying a single person, gathering data through the collection of stories, reporting individual experiences, and discussing the meaning of those experiences for the individual.

- Focus: Exploring the experiences of an individual.
- Type of problem: Needing to tell stories of a broad range of experiences.
- Discipline background: Business, humanities, anthropology, literature, history, psychology and sociology.
- Unit of analysis: Studying one or more individuals.
- Data collection forms: Using primarily interviews and documents.
- Data analysis strategies: Analyzing data for stories, "re-storying" stories, developing themes, oftentimes uses a chronology.
- Written report: Developing a narrative about the stories of the broad range of experience.

Adapted from Creswell- Educational Research: Planning, Conducting, and Evaluating Quantitative and Qualitative Research, Third Edition.

What is Case Study Research?

Qualitative research involving a bounded system focusing on a case or issue that is representative of the system. The case is the actual event, process or program, etc, (i.e., a setting or context) being studied.

- Focus: Developing an in-depth description and analysis of a case or multiple cases.
- Type of problem: Providing an in-depth understanding of a case or cases.
- Discipline background: Psychology, law, political science, medicine.
- Unit of analysis: Studying an event, a program, an activity, more than one individual.
- Data collection forms: Using multiple sources such as interviews, observations, documents or artifacts.
- Data analysis strategies: Analyzing data through description of the case and themes of the case as well as cross-case themes.
- Written report: Developing a detailed analysis of one or more cases.

Adapted from Creswell- Educational Research: Planning, Conducting, and Evaluating Quantitative and Qualitative Research, Third Edition.

Mixed-Methods Studies

Quantitative studies tell us "if", qualitative studies tell us "who", "what", "when", "where" and "why". Mixed methods combine the qualitative and quantitative approaches within different phases of the research process.

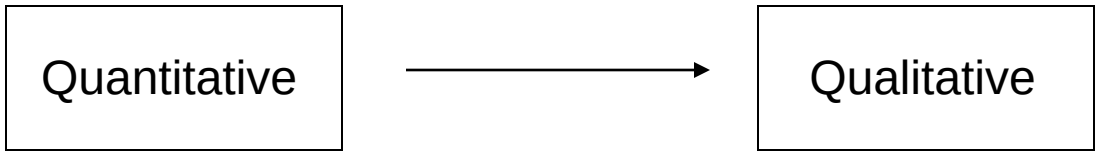
Researcher Skills

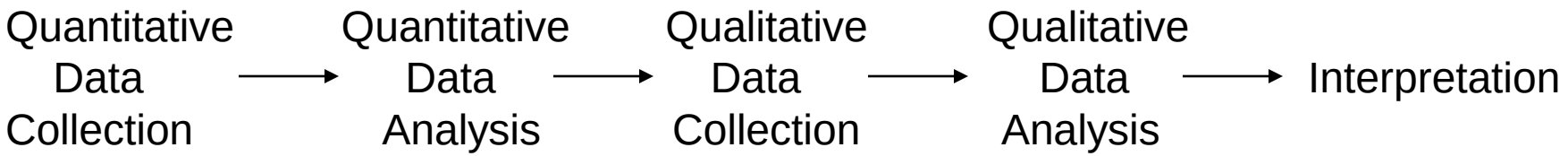
- Knowledge of quantitative and qualitative research.
- Understanding of assumptions underlying each research method.
- Working knowledge of analytic procedures and tools related to both quantitative and qualitative research.
- Ability to understand and interpret results from the different methods.
- Willingness to accept and forego methodological prejudices from training from prior discipline.
- Understanding of different disciplines, audiences and appropriate studies where mixed methods are acceptable.

The Applications of Mixed-Methods Research are Far Ranging

- Nursing
- Psychology
- Education
- Sociology
- Library and Information Science
- Information Systems
- Political Science

Sequential Explanatory Strategy

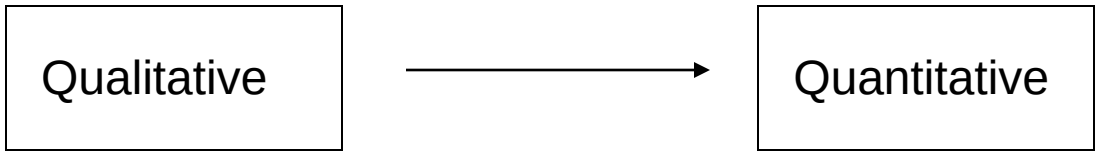


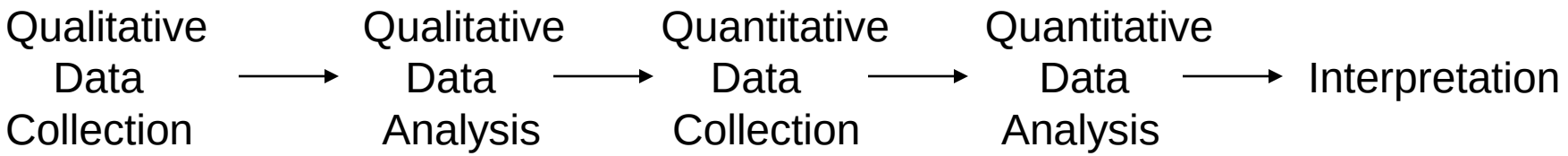


Sequential Explanatory Strategy

- The collection and analysis of quantitative data followed by the collection and analysis of qualitative data.
- Equal priority is given to the two phases.
- Data are integrated during interpretation.
- Primary focus is to explain quantitative results by exploring certain results in more detail or helping explain unexpected results (e.g., using follow-up interviews to better understand the results of a quantitative study).
- Strengths: relatively straight forward due to clear, distinct stages and easier to describe than concurrent strategies.
- Weakness: very time consuming especially when both phases are given equal consideration and priority.

Sequential Exploratory Strategy

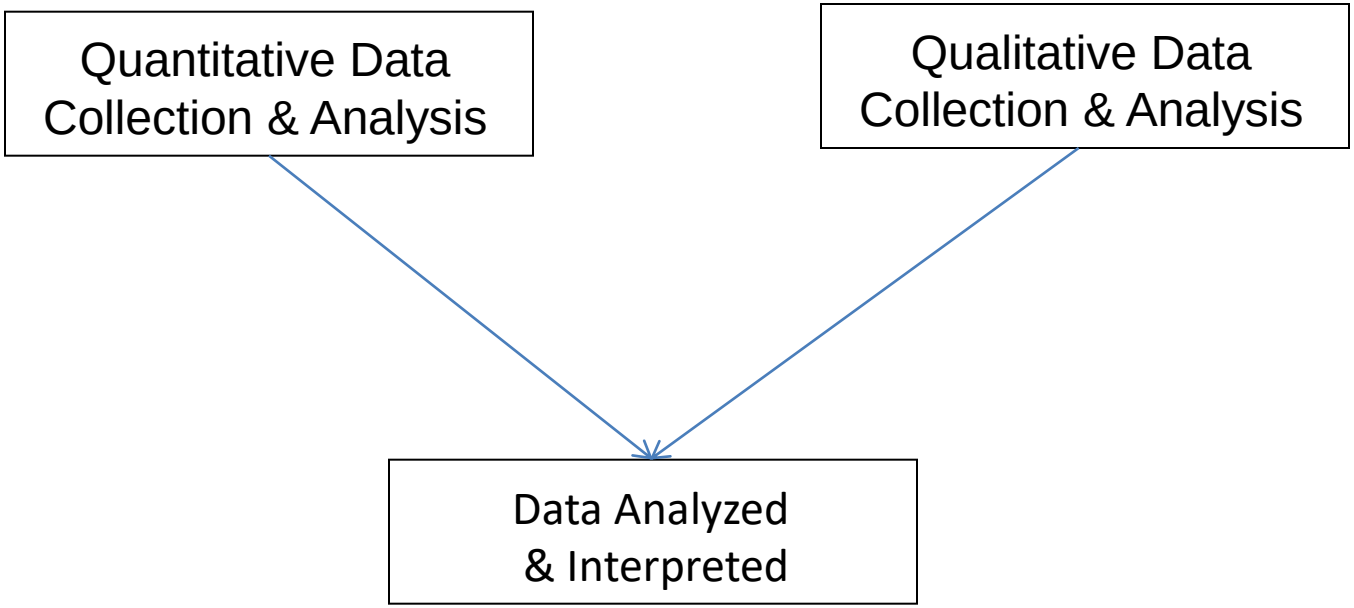




Sequential Exploratory Strategy

- The collection and analysis of qualitative data followed by the collection and analysis of quantitative data.
- Equal priority is given to the two phases but priority can be given to either.
- Data are integrated during interpretation.
- Used primarily to explore a phenomenon by:
  - Testing elements of a theory
  - Generalizing qualitative findings to different samples
  - Development of instrumentation (e.g., using a small group to create instrumentation and then collecting quantitative data based on the instrumentation).
- Strength: relatively straight forward due to clear, distinct stages and easier to describe than concurrent strategies.
- Weakness: very time consuming especially when both phases are given equal consideration and priority.

Convergent Strategy



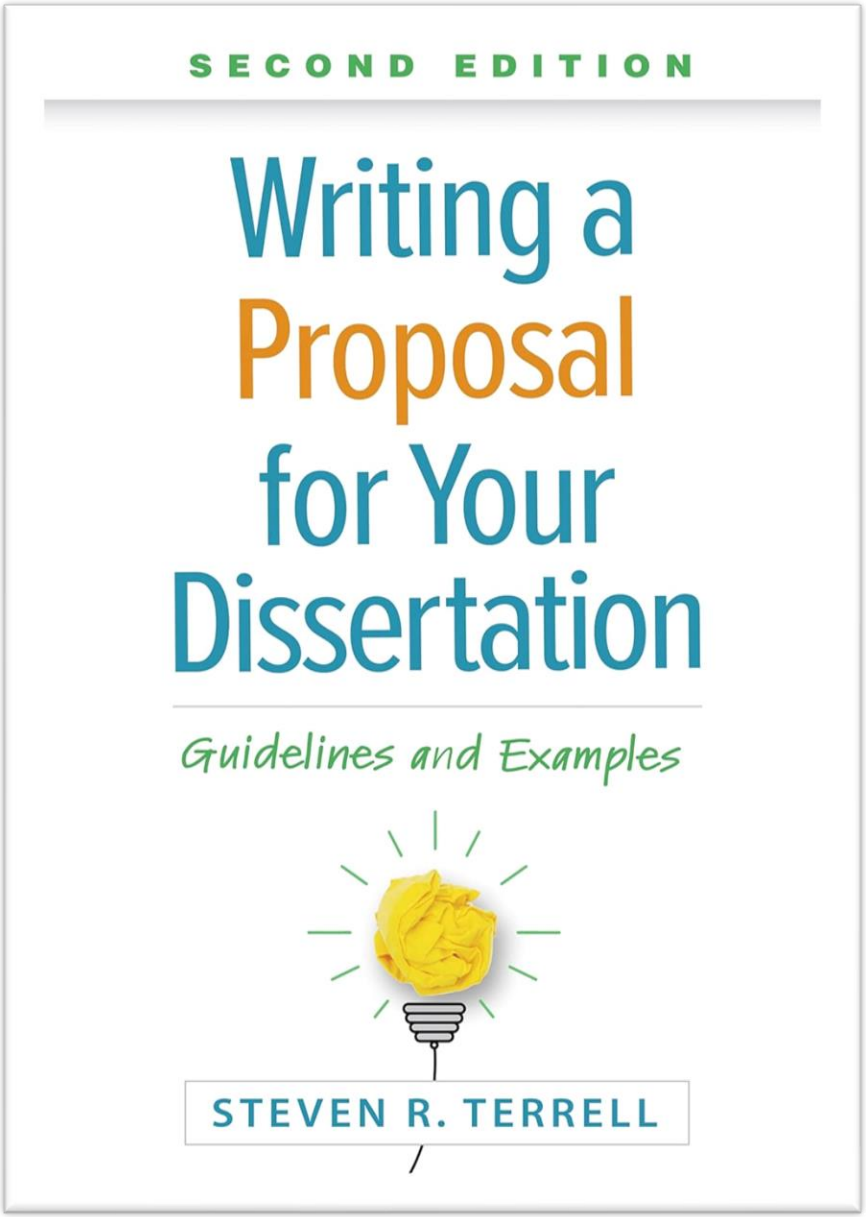
Convergent Strategy

- There are two concurrent data collection phases.
- Priority should be equal but can be given to either approach.
- Data are integrated during interpretation phase. The interpretation notes either a lack of convergence or convergence that strengthens knowledge claims. Data integration can also occur during analysis.
- Primarily purpose for confirmation, corroboration or cross-validation within a single study.
- Strengths: Familiar to many researchers. Shorter data collection time when compared to sequential methods. Offsets weaknesses inherent to one design by using both.
- Weaknesses: Requires a great deal of expertise and effort to study the phenomenon under consideration using two different methods. It may be difficult to compare two types of data as well as resolve discrepancies if they arise.

Required Researcher Skills

- Knowledge of various research methods used.
- Understanding of assumptions underlying each research method.
- Working knowledge of analytic procedures and tools related to both quantitative and qualitative research.
- Ability to understand and interpret results from the different methods.
- Willingness to accept and forego methodological prejudices from training from prior discipline.
- Understanding of different disciplines, audiences and appropriate studies where mixed methods are acceptable.

Adapted from Bazely (2004)



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