

# Methods of Education Research

Most Common Methods,  
Controversies, and Ethical  
Considerations related to Methods  
and Research Instruments

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# Different Types of Research

- Basic Research
- Applied Research
- Evaluation Research
- Action Research

# Additional types of research

- Historical Research
- Descriptive Research
- Correlational Research
- Causal Comparative Research/ Quasi-Experimental Research
- Experimental Research

# Who are your “people?”

- What is your population of interest
  - To whom would you like the results to be generalized?
  - How do you select your sample in a way that enables you to generalize the results to this sample?
  - What do you wish to generalize to this sample?
  - What are some ways of selecting an appropriate Population?

# How and why are you sampling?

- Random Sampling
- Stratified Sampling
- Cluster Sampling
- Systematic Sampling
- Some challenges to sampling include:
  - Sampling Bias
  - Size
  - Population
  - Self Selection
  - Snowballing
  - Available group use
- How will you inform your funders that you have addressed these challenges/threats?

# Research Instruments

- Assessments to be administered to determine effectiveness or impact?
- Developer Created versus Externally Developed?
- Standardized Tests
  - Things to look for include:
  - Validity Define Validity
    - » Construct, Content, Item, Concurrent, Sampling Face, Predictive, Construct
  - Reliability Define Reliability
    - » Inter-rater, Test-Retest, Equivalent Forms, Split Half
- Observation
  - Questionnaires
  - Surveys
- Focus Groups

# Ethical considerations

- Right to refuse to be involved
- Right to stop being involved
- Strategies for achieving and maintaining support from participants (schools, universities)
- Training others to implement the treatment.
- No harming of students (minimal risk)
- Subject's right to privacy
- Parental consent
- Collecting data without permission
- Sharing of data

# Ethical Considerations

- Refusal of treatment to participants who may need it
- Advocacy versus research
- Gould Experiment
- Tuskegee (syphilis study)
- AIDS study (overseas)
- Aspirin and Heart Attack study
- When is enough enough?
  - Zimbardo Prison Study
  - Milgrim Study

# Two pieces of legislation on ethics

- National Research Act of 1974
  - Approval of the study by an external organized group prior to implementation of the study (IRB)
    - » No harm
    - » Informed consent
    - » Parental or guardian permission(signatures)
- Family Educational Rights and Privacy Act (Buckley)
  - Privacy of educational records of students
    - » e.g. recoding student id numbers
    - » Masking direct access to student records

# Descriptive Research

- Why conduct descriptive research?
  - How do some of these procedures differ from, or how are they similar to those of Quantitative Researchers?
  - Test Hypotheses and answer questions
  - Develop an appropriate instrument for gathering information
  - Self Reports may include
    - » Questionnaires, interviews, standardized attitude scales (likert)

# Qualitative Research

## ■ Observation

- Naturalistic
- Role Playing
- Case Studies
- Content analyses (e.g. portfolios)

## ■ Participant Observation

- Research is embedded in the study
  - » Uri Triesman
  - » Slim's Cafe

# Ethnography

- Classroom Based
- School Based
- Enclosed group based
- Any of the above

# Correlational Studies

- Why conduct correlational studies?
  - Positive
  - Negative
  - Zero
- When would it be good to have a positive correlation
- When would it be good to have a negative correlation
- When would it be good to have a zero correlation?

# Causal Comparative or Quasi Experimental Designs

- Experimental Group
- Control Group
- Independent Variable (manipulated?)
- Dependent Variable
  - Controlling using matching
  - Comparing subgroups
  - Co-Varying

# Randomization

- Both groups are equal at the onset of the study
- Causal Relationship between two variables
- Treatment and comparison/control group
- Treatment versus no treatment
- Treatment A versus Treatment B
- Exposure for a determined amount of time
- Post-test
- So what sets this apart from Quasi-experimental designs?
- Stay Tuned

# Direct power over independent variables

- Direct Manipulation
  - Manipulation of at least one independent variable.  
Direct and intentional
- Direct Control
  - Direct control over what is provided to each group
- Control of subject variables
  - Pretest scores, pretest performance
- Control of environmental variables
  - Curriculum materials, length of exposure, etc.

# What's the buzz?

- Effect Sizes
- Evidence of Effectiveness
- Impact
- Power Analysis
- Type 1 and Type 2 Errors
- Minimal Detectable Effects
- Interclass/Intraclass Correlations
- Counterfactual (what would have happened if we had provided this intervention or treatment?)
- Value Added Models
- Single Unit Transfer Variable Assumption

# Any problems with Experimental Designs?

- WHAT? Problems? What Problems?
- Threats!!!
- You threatening me?
- Er, no, threats to internal and external validity
- Internal Validity
  - History, maturation, testing, instrumentation, statistical regression, differential selection, mortality
- External Validity
  - Pretest-treatment interaction, multiple treatment interference, experimenter effects, reactive arrangements (hawthorne effect).