Educational Research
What is experimental research in education

• Started in educational psychology
  – Issues of Transfer
    • Thorndike
    • Woodworth

• Used in each of the educational paradigms
  – behaviorism
  – cognitivism
  – objectivism
  – instructivism
  – constructivism
Qualitative and Quantitative Designs

• Quantitative research paradigm
  – hypothesis confirming
  – physical science experimental model
  – analyze components of the phenomena

• Objective instruments of measurements
  – static and positivistic
    • all things are equal (on/off, right/wrong)
    • we can test it
    • attempts to objectify human events
    • presumes lawful behavior
Qualitative and Quantitative Designs

• Qualitative research paradigm
  – hypothesis seeking
  – anthropological naturalistic-inquiry model
  – analyze phenomena holistically

• Subjective instruments of data collection
  – descriptive rather than causal
  – dynamic
  – presumes that social reality constantly changes and is therefore unlawful
Qualitative Analysis

- Analytical Framework
- constitutive ethnography -
- within totality of meaning for the group [emic insiders; etic outsiders]
- symbolic interactionism - reality known as social production -
- people define their own definitions of situations, they interact with others,
More Qualitative Analysis

- situations are negotiated, unpredictable,
- involve the manipulation of symbols, roles and meanings of the objects
- Types of data collected
  - naturalistic observations
  - interviews - formal and informal narratives
  - surveys
  - historical documents
  - unobtrusive forms of data collection
More Qualitative Analysis

• Search for cultural themes
  – semantic patterns - terms, expressions, idioms
  – important factors as viewed by the culture
  – hegemonic (power) issues
  – use of artifacts (tools)

• The power of this research is to richly describe the environment so one can generalize from one setting to another
Qualitative Analysis

• Interchangeable with
  – naturalistic
  – ethnographic
  – subjective
  – postpositiviistic
Qualitative Analysis

- developing an understanding of human systems
- conducted in natural setting
- without manipulation
- rich descriptions
- research questions evolve
Qualitative methods

- methods fit the questions to be addressed
- questions change over time
- observations
- interviews
- document and artifact analysis
Qualitative methods

- Participant observation
- Nonparticipant Observation
- Interviews
  - structured
  - nonstructured
  - schedule, protocols
- Document Analysis
  - Content analysis
More on methods

- Issues
  - scope
  - biases
  - observers roles
  - what to record
  - sampling
  - multiple observers
Analysis Methods

• Data reduction
  – interpreters do not reduce data but scan for patterns

• Constant comparison -
  – coding data - data collection ceases when no new categories are found

• Field notes

• Video/audio logs

• Data Management
Grounded Theory

- type of qualitative method
- general methodology for developing theory that is grounded in data systematically gathered and analyzed
- develop a theory through an iterative process
  - data analysis
  - theoretical analysis
  - verification of hypothesis
Grounded Theory

- Open minded collection
- looking for patterns
- patterns build theory
- continue collecting data until patterns repeat or new ones emerge
  – hence grounded
Ethical Issues

- Preventing harm to subject
- Protecting anonymity and privacy
- Not deceiving subjects
- Informed consent
- Does pursuit of science justify this?
- What’s public and what’s private
- Researchers immunity?
- Paid research?
Evaluation of Qualitative Research

- Expressions of subjectivity and biases
- Multiple observers, repeated interviews
- Constant refinement and testing
- Making the world real to the reader - to recognize the authenticity of the study
Other Criteria

- Participant observers are less likely to err
- Free access to a broad range of activities
- Intense observations over a long time
- Use of both Qs
- Triangulation
- Unobtrusive measures
Validity and Relevance

• **Validity** - truth of the study
  – findings reasonable
  – ethnographer’s judgement
    • nature of phenomena
    • circumstances of research
    • characteristics of researcher

• **Relevance**
  – Public value evenhanded
  – policy related, interdisciplinary
  – sorted out descriptions, analysis and opinions
Quantitative Analysis

• Descriptive
  – Frequencies, graphical representation
  – Central tendency - mean, median, mode,
  – Variability - standard deviation 68% lies within 1 SD (16% in each wing)
  – Correlation measures - use of scatter diagram
  – Regression analysis - Knowing "x" can predict "y" correlation does not mean causation!
More Quantitative Analysis

• Inferential

• Sampling distribution - random sampling
  – Hypothesis testing
    • hypothesis formed
    • sample drawn
    • accept hypothesis if outcomes are different from expected
  – Generalizing from the results to other samples
Types of Design

- True Experiments
- Repeated Measures
- Quasi-experimental
- Time Series Design
- Ex Post Facto Design
Comparing The Two Qs

- Some suggest diametrically opposite
- positivistic vs naturalistic
  - nature of reality
  - relationship of researcher to subject
  - generalizability
  - discussions of causality
  - role of values
Positivism

- posing hypothesis
- manipulation
- active observation
- testing of hypothesis