Research design

The difference between “method” and “methodologies”

Method:
Technique for gathering evidence
The various ways of proceeding in gathering information

Methodologies:
The underlying theory and analysis of how research does or should proceed, often influenced by discipline

( Sandra Harding )
Empirical research method
There are two major groups:

Descriptive (Qualitative) Method
- Ethnography
- Case study
- Survey / Sampling
- Focus group
- Discourse / text analysis
- Prediction / classification

Experimental (Quantitative) Method
- True experiment
- Quasi-experiment
- Meta-analysis
Ethnographies

+ Observational field work done in the actual context being studied

+ Focus on how individuals interrelate in their own environment (and the influence of this environment)

- Difficult to interpret/analyze

- Time consuming/expensive

- Can influence subject behavior
Case studies

+ Focus is on individual or small group
+ Able to conduct a comprehensive analysis from a comparison of cases
+ Allows for identification of variables or phenomenon to be studied
- Time consuming
- Depth rather than breadth
- Not necessarily representative
Survey research

+ An efficient means of gathering large amounts of data
+ Can be anonymous and inexpensive

- Feedback often incomplete
- Wording of instrument can bias feedback
- Details often left out
Focus group

+ Aid in understanding audience, group, users

+ Small group interaction more than individual response

+ Helps identify and fill gaps in current knowledge (perceptions, attitudes, feelings, etc.)

- Does not give statistics

- Marketing tools seen as “suspect”

- Analysis subjective
Discourse / text analysis

+ Examines actual discourse produced for a particular purpose (job, school)

+ Helps in understanding of context, production, audience, and text

- Schedule for analysis not demanding

- Labor intensive
Prediction / classification studies

+ Goal is to predict behaviors:
  Prediction forecasts and interval variable

+ Classification forecasts a nominal variable

+ Important in industry, education to predict behaviors

- Need substantial population

- Restricted range of variables can cause misinterpretation

- Variables cannot be added together; must be weighted and looked at in context of other variables
Advantages of qualitative research

Naturalistic; allows for subjects to interact with environment

Can use statistical analysis

Seeks to further develop theory (not to influence action); Prescientific

Coding schemes often arise from interplay between data and researcher’s knowledge of theory
Disadvantages of qualitative research

Impossible to overlay structure

Impossible to impose control

Subject pool often limited, not representative

Seen as more “subjective,” less rigorous

Beneficial only in terms of initial investigation to form hypothesis
True experiment

+ Random sampling, or selection, of subjects (which are also stratified)
+ Introduction of a treatment
+ Use of a control group for comparing subjects who don’t receive treatment with those who do
+ Adherence to scientific method

- Must have both internal and external validity
- Treatment and control might seem artificial
**Quasi-experiment**

+ Similar to Experiment, except that the subjects are not randomized. Intact groups are often used (for example, students in a classroom).
+ To draw more fully on the power of the experimental method, a pretest may be employed.
+ Employ treatment, control, and scientific method

- Act of control and treatment makes situation artificial
- Small subject pools
Meta-analysis

+ Takes the results of true and quasi-experiments and identifies interrelationships of conclusions
+ Systematic
+ Replicable
+ Summarizes overall results

- Comparison of apples and oranges?
- Quality of studies used?
Advantages of experimental research

Tests the validity of generalizations

Seen as rigorous

Identifies a cause-and-effect relationship

Seen as more objective, less subjective

Can be predictive
Disadvantages of true experiment

Generalizations need to be qualified according to limitation of research methods employed

Controlled settings don’t mirror actual conditions; unnatural

Difficult to isolate a single variable

Doesn’t allow for self-reflection
What makes research good?

Validity

Reliability

Replicability

Consistent application/analysis

“Trustworthiness”

Rigor
Validity in research

Refers to whether the research actually measures what it says it will measure. Validity is the strength of our conclusions, inferences or propositions.

**Internal Validity:** The difference in the dependent variable is actually a result of the independent variable

**External Validity:** The results of the study are generalizable to other groups and environments outside the experimental setting

**Conclusion Validity:** We can identify a relationship between treatment and observed outcome

**Construct Validity:** We can generalize our conceptualized treatment and outcomes to broader constructs of the same concepts
Reliability in research

The **consistency** of a measurement, or the degree to which an instrument measures the same way each time it is used under the same condition with the same subjects. In short, it is the **repeatability** of your measurement. A measure is considered reliable if a person's score on the same test given twice is similar. It is important to remember that reliability is not measured, it is estimated. Measured by test / retest and internal consistency.
Validity and reliability

The relationship between reliability and validity is a fairly simple one to understand: a measurement can be reliable, but not valid. However, a measurement must first be reliable before it can be valid. Thus reliability is a necessary, but not sufficient, condition of validity. In other words, a measurement may consistently assess a phenomena (or outcome), but unless that measurement tests what you want it to, it is not valid.
Rigor in research

Validity and Reliability in conducting research

Adequate presentation of findings: Consistency, trustworthiness
Appropriate representation of study for a particular field: Disciplinary rigor
Rhetorical Rigor: How you represent your research for a particular audience
Key consideration to design your research approach

What question do you want to answer?

For what purposes is the research being done? i.e., what do you want to be able to do or decide as a result of the research?

Who are the audiences for the information from the research, e.g., teachers, students, other researchers, members of a disciplinary community, corporate entities, etc.?

From what sources should the information be collected, e.g., students, teachers, targeted groups, certain documentation, etc.?
How can that information be collected in a reasonable fashion, e.g., questionnaires, interviews, examining documentation, observing staff and/or clients in the program, conducting focus groups among staff and/or students, etc?

How accurate will this information be?

When is the information needed (so, by when must it be collected)?

What resources are available to collect the information?

How will this information be analyzed?
The importance of methods and methodologies

“The most common error made in reading [and conducting] research is overlooking the methodology, and concentrating on the conclusions. Yet if the methodology isn’t sound, the conclusions and subsequent recommendations won’t be sound.”

“Patricia Goubil-Gambrell”