

Introduction to Qualitative vs. Quantitative research

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Outline

- Qualitative Research
- Quantitative Research
- Comparison
- How they work together
- Examples of techniques and methods

Quantitative

- **Quant:** *what, where, and when* of **natural phenomena**
 - develop and employ mathematical models, theories and hypotheses pertaining to natural phenomena
 - Involve large samples of subjects; deal with cause/effect
 - Associated with **positivism**: that objective truth can be known with certainty, that it can be gained through rational methods

Positivism

- a single, tangible reality "out there" that can be broken apart into pieces capable of being studied independently
- the separation of the observer from the observed
- what is true at one time and place will also be true at another time and place.
- An assumption of linear causality; there are no effects without causes and no causes without effects.
- the results of an inquiry are essentially free from beliefs, interpretations

“Experimental” Designs

R X₁ O (R = randomly assigned subjects; X = treatment)

R X₂ O (O = observation/outcome)

Should be:

- **Replicable:** repeat with the same results in another setting
- **Generalizable, representative**
- **Cumulative:** observations from earlier experiment used as a basis for new one
- **Causal:** establishes cause and effect (predictive)

Quasi-Experimental

X_1 **O** (R = randomly assigned subjects;
X = treatment)

X_2 **O** (O = observation/outcome)

Randomness is approximated through pre-tests
to ensure “equivalence”

Qualitative Research

- *why* and *how* of **human behaviour**
 - Work with a range of models, theories, pertaining to human phenomena
 - Involve small groups of participants; interpretation & reflection
 - Speech and texts, and their interpretation are very important
 - People's accounts of their actions significant
 - **Not** Positivist: no objective truth; different interpretations; no final certainty in knowledge

Quantitative issues

Quant: Indispensable in areas like user demographics, issues of equity, patterns of use; BUT:

- Can produce a false sense of certainty
- Takes the subject outside of natural setting/tasks
- With the experimental method, can result in:
 - “no significant difference” phenomenon
 - “Hawthorne” (placebo) effect

Qualitative issues

Qual: Requires a different way of thinking to address issues like:

- Reliability: repeatable with same/comparable results
- Validity: relationship between conditions and results
- Generalizability: historical and cultural limitations

“Conventional vs. Naturalistic terms”

(Lincoln & Guba, 1985; Hoepfl, 1997)

Conventional

- **Internal validity**
(inference regarding cause-effect relationships; did the treatment make a difference? Or did other factors intervene?)
- **External validity** (how did you define your sample?)
- **Reliability** (repeatability of observations & of measures)

Naturalistic

- **Credibility** (are the results credible from the perspective of the participant?)
- **Transferability** (achieved by thoroughly describing the research context and the assumptions that were central to the research)
- **Dependability** (emphasizes the need for the researcher to account for the ever-changing context within which research occurs)
- **Confirmability** (the degree to which the results could be confirmed or corroborated by others)

When is Qualitative Useful?

- Qualitative research relies on imprecise and everyday notions of what is valid, etc.
- But it does so reflexively; in a self-aware and theoretically-mediated manner.
- Qualitative is useful in relationship to quantitative **if:**
 - The topic has been researched for a long time in the same way
 - The topic is new to research
 - You would like in-depth information that may be difficult to convey quantitatively

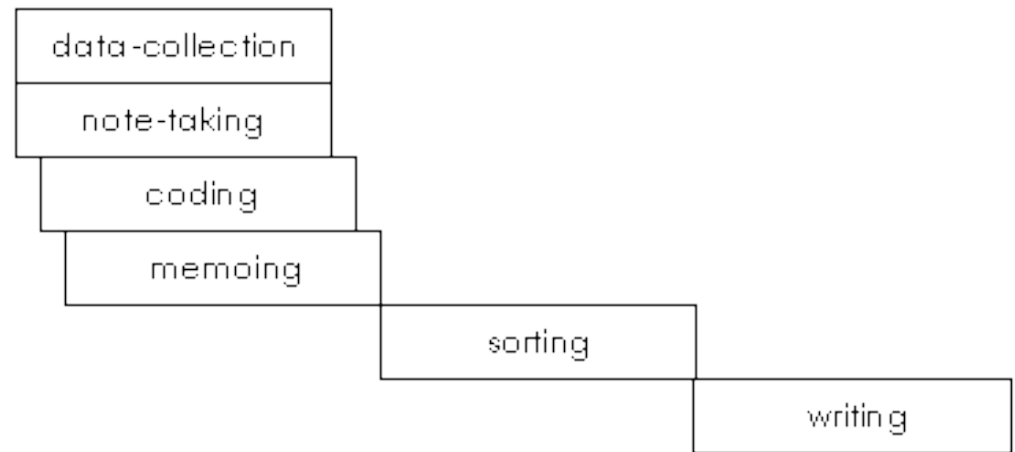
Relationships:

- "All research ultimately has a qualitative grounding" (Campbell, 1974)
- First address *why* and *how*; then *what*, *where*, and *when* can be more meaningfully asked and answered
- Interdependent: Facts/Numbers & Interpretation/values (e.g. Web logs; demographics)
- **Mixed methods:** Sequential or concurrent

Grounded Theory

- theory that is developed inductively from a corpus of data
- Is case-oriented; no hypothesis is tested
- Interviews & other data collection can be used

- “constant comparison”
data set \leftrightarrow theory



(Source: <http://www.scu.edu.au/schools/gcm/ar/arp/grounded.html>)

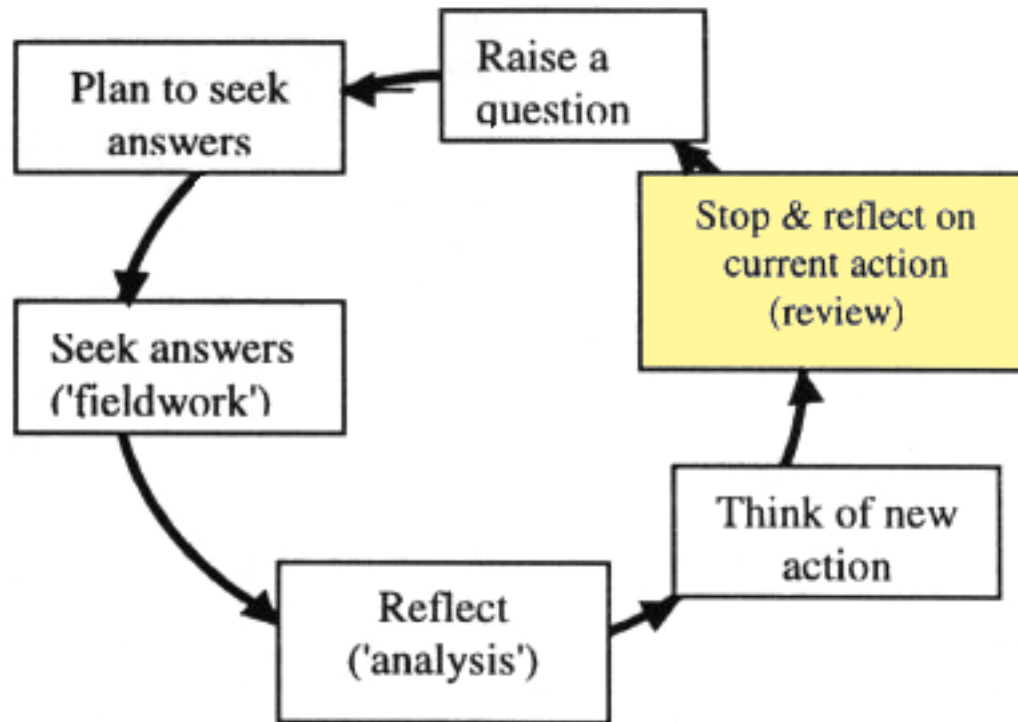
Action Research

- disciplined inquiry into practices undertaken by those involved in them
- done to inform and change the practice studied. To address problems
- Often undertaken as a collaborative activity among colleagues
- Often undertaken *in situ*
- Could focus on a single issue in a classroom, a program, etc.

Action Research

- a cycle of posing questions, gathering data, reflection, and deciding on a course of action
- Participatory action research:
 - collaborative & political,
 - involving all stakeholders;
 - critical reflection on the historical, political, cultural, economic, geographic and other contexts which make sense of it.
- Source: http://www.alliance.brown.edu/pubs/themes_ed/act_research.pdf
- Source: http://en.wikipedia.org/wiki/Participatory_action_research

Participatory Action Research Cycle



Source; <http://www.communitysolutions.com.au/papers/LMpartnerships.html#alr>

Case Study

- a research strategy, sometimes likened to an experiment, a history, or a simulation, though not linked to any particular type of evidence or method of data collection
- an in-depth, longitudinal examination of a single instance or event
- investigates a phenomenon within its real-life context

– Source: Wikipedia

Ethnography

- “The study and systematic recording of human cultures; *also* : a descriptive work produced from such research (m-w.com)
- Field work; observation, interviews, questionnaires, producing description
- Often related to **social constructivism**: how do people make sense of their world; how do they accomplish things through their practice?
- Emic (observer perspective) vs. etic (actor perspective)
 - Source: Wikipedia

Recommended Resources

- Hoepfl M.E. (1997). Choosing Qualitative Research: A Primer for Technology Education Researchers. *Journal of Technology Education* 9(1).
<http://scholar.lib.vt.edu/ejournals/JTE/v9n1/hoepfl.html>
- Creswell, John W. (2002). *Educational Research: Planning, Conducting, and Evaluating Quantitative and Qualitative Research*. Upper Saddle River, NJ: Merrill.
- Flyvbjerg, B. (2001). *Making Social Science Matter: Why Social Inquiry Fails and How it can Succeed Again*. Cambridge UP