Research Paradigm

Types of Research Method

- Quantitative (numbers)
  - What can be measured
  - Objective collection and data analysis analysis objective data
  - Statistical data analysis
- Qualitative (descriptions)
  - Subjective
  - Typically opinions and perceptions
- Positivist or phenonmenalist approaches

Types of Research Method

	Quantitative	Qualitative
Type of reasoning	deductive	inductive
Concepts	identifies concepts and *investigates* relationships	identifies concepts
Action	tests relationships between concepts	describes a situation
Outcome	accepts (or rejects) proposed theory	illuminates the situation
Approach to validity	truth seen as objective and universal	truth seen as socially-constructed

Types of Research Method

	Quantitative	Qualitative
Type of reasoning	deductive	inductive

Deductive reasoning :

- works from more general to the more specific ("top-down")
- analyse / reflect on observation to identify a specific hypotheses
- narrow the theory further to collect observations
- "*This ultimately leads us to be able to test the hypotheses with specific data -- a confirmation (or not) of our original theories*" (Trochim, 2006)

Types of Research Method

	Quantitative	Qualitative
Type of reasoning	deductive	inductive

Deductive reasoning :

- observation: *students learning via a VLE appear more engaged with learning materials*
- a specific hypotheses:
- what could you observe:

Types of Research Method

	Quantitative	Qualitative
Type of reasoning	deductive	inductive

Inductive reasoning :

- moves from specific observations to broader generalisations (“bottom up”)
- begin with specific observations and measures
- detect patterns and regularities
- form a tentative hypotheses
- explore hypothesis
- develop some general conclusions or theories.(Trochim, 2006)

Types of Research Method

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Inductive reasoning :

- observe that: students in Computer Labs tend to get distracted by Facebook
- what could you observe?
- what patterns might these yield?
- form a tentative hypotheses
- what general conclusion might you form?

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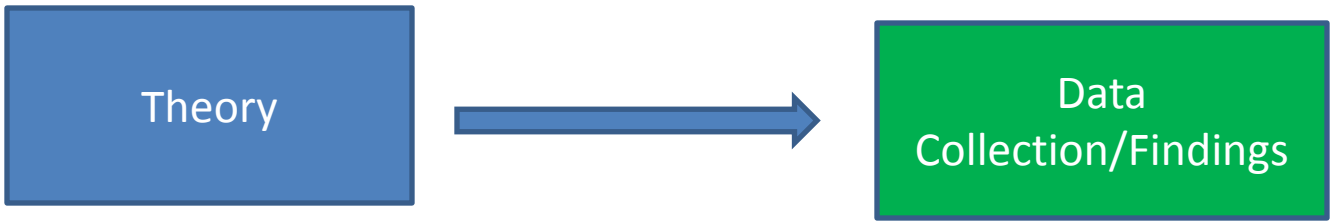
Types of Research Activity

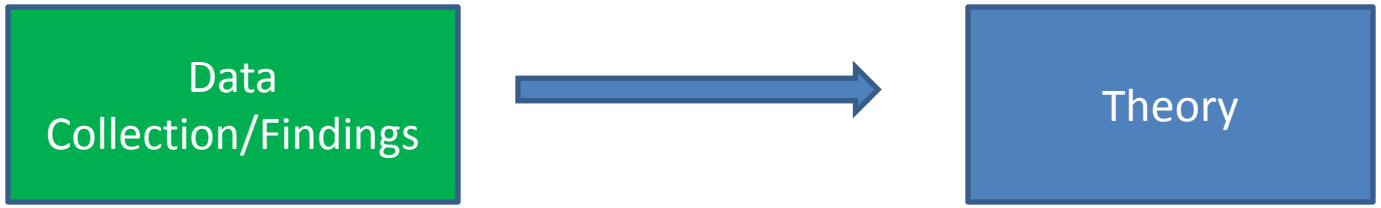
- Description (*fact finding*)
  What is the number of, amount, effect of ...
- Exploration (*looking for patterns*)
  How is this like that, similarities / differences
- Analysis (*explaining why or how*)
  Why does this happen?
- Prediction (*forecasting the likelihood of particular events*)
  What will to that if I do this,
- Problem Solving (*improvement of current practice*)
  Action research gain knowledge by observation and effect outcome by intervention (i.e. get on and do it)

Deductive and Inductive Approaches

Deductive



Inductive



Another Perspective by Creswell (2009)

- Quantitative Research

- Qualitative Research

Quantitative Research

- Is a means for **testing objective theories** by examining relationship among variables
- These variables can be measured, so that numbered data can be analyzed using statistical procedures
- Those who engage in this form of research have assumptions about testing theories **deductively**
- Researchers build in protections against bias

Qualitative Research

- Is a means for exploring and understanding the meaning individual assign to a social problem
- It involves emerging questions and procedures
- Data typically collected in the participant's setting
- Data analysis **inductively** builds from particulars to general themes, where the researcher interprets the meaning of the data

Quantitative

- Useful when looking for facts or causes
- Controlled measurements
- Objective (predictive)
- Outside perspective
- Deductive and verification oriented
- Outcome oriented – does your variable really control something
- Particular and closed
- Assume a stable reality otherwise results are worthless

Qualitative

- Useful when trying to understand behaviours
- Uncontrolled observation – that is just observation without you controlling
- Subjective
- Insider perspective on the data
- Discovery-orientated, explanatory and descriptive
- Process orientated – that is you drive the research
- Holistic and open
- Assume a very dynamic reality

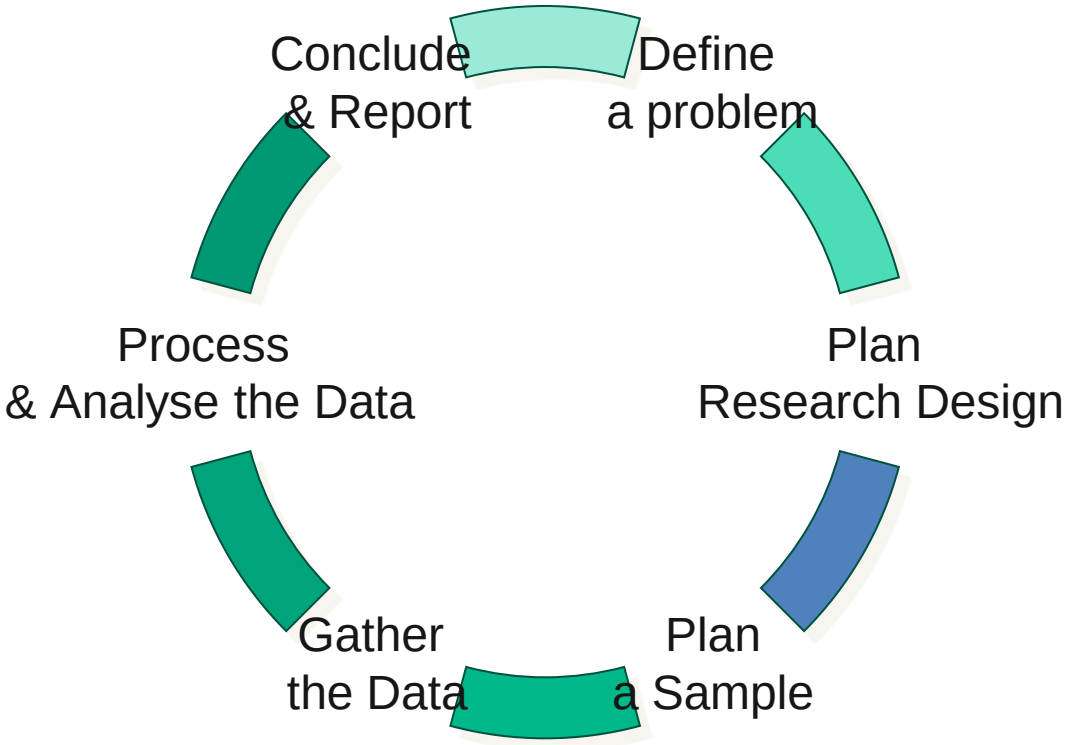
Fundamental difference

	Quantitative	Qualitative
Principal Orientation to the role of theory to the research	Deductive- testing of theory	Inductive- generation of theory
Epistemological Orientation	Natural Science, Positivism	Interpretivism, Phenomenological
Ontological Orientation	Objectivism	Constructivism

Typical Research Methods

- Descriptive Research (*fact finding*)
  - Statistical surveys
  - Sampling
  - Interviews
- Analytical Research (*explaining why or how*)
  - Case studies
  - Observations
  - Historical analysis
- Predictive Research (*forecasting the likelihood of particular events*)
  - identifying and / or defining measurable variables, and manipulating them (changing them) to cause something measurable
- Action Research (*improvement of current practice*)
  - observe -> reflect -> plan -> act

Stages in Research Design



How you proceed …

depends on what you believe …

- **positivists** believe that knowledge is based on the observation of phenomena in an objective and real world
  - such facts have no social value
  - can be observed regularly
  - can seek out casual relationships
  - about proposing and validating theories

Positivism

- Deals with positive facts and observable phenomena
- Subscribes to the ‘scientific method’
- Primary goal is not only description but prediction and explanation
- Classification of substances and events, and observation of these, consistencies in patterns and properties
- Characterized by absolute or varying degree of generalization
- **Quantitative** (it draws on measurable evidence)

Positivist research methods

- Descriptive research
  - Anything that is variable, varies to a defined degree, and thus can be measured
  - Surveys, case studies, causal comparative studies, correlation studies, developmental studies, trend studies
- Experimental research
  - Deliberate manipulation of certain factors under highly controlled conditions
  - Purpose is to identify causal connections through keeping the levels of some variables constant and manipulating others

How you proceed …

depends on what you believe …

- **phenominalists** believe that each phenomena is unique and is controlled by variables such as time, location and culture ('socially-constructed')
  - No two situations are identical ('constructions of the human mind' Cornford & Smithson, 2006)
  - Essentially subjective, where the content of research and the way it is pursued is indicative of researchers intention
  - Outcomes are descriptions which are expressed in narrative and mainly in qualitative terms

Example

- Can the study of "breach of security incidents" provide the basis for improvements in security?
  - Positivist approach: collect data via interview, classify types of incidents, produce analyses, make recommendations based on analysis
  - Phenominalist approach: analyse interviews in depth, seek to draw conclusions about causal factors