Lecture One: Introduction to Research Methodology and Design

Professor David Walwyn
Overview

• Lecture One: Introduction to Methodology
• Lecture Two: Research Proposal
• Lecture Three: Research Design
  – QUANT and QUAL
  – Mixed methods
• Lecture Four: Data Analysis
Feedback on 2016

- More material on the various theoretical models in research
- More attention on addressing the issues relating to specific needs of some faculties
  - MSc engineering students would like presentations that focus specifically on doing research in their fields
- More material on addressing the various modes of data analysis
  - more statistics inferential workshops where things like regression and structural modelling can be covered.
- More focus on academic writing skills
  - journal writing workshops
- How to stay motivated during one's research
Lecture One: Introduction to Research Methodology and Design

• Definition of key terms
• The structure of knowledge
• Essential attributes of research
Antonio Gramsci

- An Italian political scientist (Marxist), most well known for his theories on civil society vs. political society.
  - he said “the point of modernity is to live a life without illusions while not becoming disillusioned”.
  - modernity is a rejection of the traditional in favour of the principles of the Enlightenment (reason, evidence and analysis)
  - why is this relevant to research methodology?
    - what is reality?
    - what is (scientific) knowledge?
    - what is research?
Outline of the Dissertation Process

1. Develop an Understanding of Methodology
2. Define Problem Statement
3. Initial Literature Survey
4. Develop Proposal (Includes Research Design)
5. Submit Ethics Application
6. Data Collection
7. Data Analysis
8. Write Final Report
Key Definitions

• What is RESEARCH?
  – An activity whose purpose is the generation of new knowledge by means of scientific method(s)

• In more detail …
  – Frascati Manual (OECD); research and experimental development comprises creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man (sic), culture and society, and the use of this stock of knowledge to devise new applications
Key Definitions 2

• What is RESEARCH METHODOLOGY?
  – body of knowledge which attempts to explain/understand (and hence develop structure for) ‘how research is done’
  – the various steps that are generally adopted by a researcher in studying his research problem (method) together with the associated logic (what and why)

• What is RESEARCH METHOD?
  – the specific process or steps followed by researchers in undertaking research (experimental design, data collection, etc)

• What is RESEARCH DESIGN?
  – the overview or plan of the actual steps (c.f. the architect’s drawings of a house vs. the builders steps)
Key Definitions 3

• What is ONTOLOGY?
  – the (philosophical) study of the categories of being (reality) and the relationships between them (ontology of NSI or knowledge)

• What is EPISTEMOLOGY?
  – the philosophical study of the nature and scope of knowledge (e.g. traditional vs. scientific)

• What is TELEOLOGY?
  – the notion of root cause or objectives; it is an account of a given activity’s or object’s purpose OR a definition of an object or activity based on its purpose (e.g. a car is a form of transport)
Research Design and Personal Epistemologies

- Beliefs and assumptions about knowledge influence research methodologies and hence design
- Initial part of research must be self-reflexive
From the Fundamental to the Applied

1. Ontology
2. Epistemology
3. Methodology
4. Method
5. Teleology
6. Process
Model of Personal Epistemology

- Epistemology
  - encompasses
  - Personal Epistemology
    - consists of
      - Realism
        - used to measure
        - impacts
      - Relativism
        - used to measure
        - impacts
    - Interpretative Phenomenological Analysis
  - Research Methodology
    - is driven by
  - Research Objective and Questions
- Knowledge
  - consists of
    - Procedural Knowledge
    - Acquaintance Knowledge
  - Propositional Knowledge
    - Scientific Research
    - is part of
      - Qualitative Methods
      - Mixed Methods
      - Quantitative Methods
- Constructivism
  - feeds into
  - Research Design
    - feeds into
  - Positivism
    - is associated with
Major Philosophical Identities in Management Research

- **Positivist**
  - *the natural scientist*

- **Interpretivist**
  - *the artist*

- **Critical Realist**
  - *the archaeologist*

- **Pragmatist**
  - *the architect*

- **Postmodernist**
  - *the political activist*

- HART profiling; did you complete the assessment?
Ontologies

- The dominant ontological claims:
  - Positivism; that there exists a single reality which is constant in time and independent of human experience or the observer
  - Constructivism/relativism; that there exist multiple realities dependant on the observer (in the extreme form there is no such notion as an objective reality)
  - Critical realism; that there multiple versions of the ‘knowledge of reality’ but only a single reality
  - Pragmatism; considers that practical consequences constitute the essential criterion in determining meaning, truth, or value
  - Post-modernism; contemporary movement of thought which rejects ... the possibility of objective knowledge and is therefore skeptical of truth, unity, and progress
# Research Philosophies and Design

<table>
<thead>
<tr>
<th>Philosophy</th>
<th>Approach</th>
<th>Data Type</th>
<th>Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positivism</td>
<td>Deductive</td>
<td>Quantitative</td>
<td>Experiments, Surveys</td>
</tr>
<tr>
<td>Interpretivism</td>
<td>Inductive</td>
<td>Qualitative</td>
<td>Interviews, Ethnography, Grounded Theory</td>
</tr>
<tr>
<td>Critical Realism</td>
<td>Abductive (Retroductive)</td>
<td>Qualitative and/or quantitative</td>
<td>Archival research, historical analysis +</td>
</tr>
<tr>
<td>Postmodernism</td>
<td>Abductive</td>
<td>Qualitative</td>
<td>Discourse analysis, visual methods +</td>
</tr>
<tr>
<td>Pragmatism</td>
<td>Abductive</td>
<td>Quantitative and/or qualitative</td>
<td>Any of the above in any combination</td>
</tr>
</tbody>
</table>
Philosophical Origins of the Bifurcation

- Ludwig Wittgenstein (1889-1951); “scientific evidence”
  - all knowledge claims must be verifiable in experience independent of the observer
  - founder of logical positivism

- Martin Heidegger (1889-1976); “being in the world”
  - research cannot be conducted independent of the observer
  - founder of constructivism
Assumptions of the Experimental Scientific Method (Positivist)

- A belief that there is some kind of ORDER which will be revealed (come to understand) through research
- External reality exists which is a shared or public reality
- Human perception and intellect is reliable (our senses can record and measure)
- Parsimony or simplicity is the ultimate aim
- Generality is possible; we can generalise from the particular to the world at large

Cohen and Manion 2000
# A Comparison of Epistemological Paradigms

<table>
<thead>
<tr>
<th>Positivist</th>
<th>Constructivist</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reality is single, objective and apart from the observer</td>
<td>Reality is subjective and multiple</td>
</tr>
<tr>
<td>Quantitative data derived from experiment</td>
<td>Qualitative data derived from observation</td>
</tr>
<tr>
<td>Reliability is most important (repeatable results)</td>
<td>Validity is important (improved by triangulation)</td>
</tr>
<tr>
<td>Deductive</td>
<td>Inductive</td>
</tr>
<tr>
<td>Location is artificial; all variables held constant except the independent variable</td>
<td>Location is natural; not possible to control any variables</td>
</tr>
<tr>
<td>Mainly experimental, preferably with control</td>
<td>Type of research includes ethnographic, participant observation, case studies</td>
</tr>
</tbody>
</table>
What is Knowledge?

- Highly contested!
- Can be defined in terms of how it MUST be generated and what quality criteria it MUST meet
The Construction of Knowledge

Deduction

Theory → Hypothesis → Research Design

Induction

Analysis and Interpretation ← Data Collection ← Observation

Research Questions ← Research Design
Essential Attributes in Research

• Marais defines three necessary dimensions of research:
  – Teleological (describe, explore, explain/understand)
  – Constituent (conceptualisation, hypothesis, observation and communication)
  – Epistemic (internal and external validity, reliability, ‘replicability’, objectivity)

• Most research can be judged on the extent to which the three dimensions have been satisfied (was the objective clear; has the due process been followed; is the knowledge of a suitable quality?)
Theory and Practice

• Theory is when you know everything but nothing works
• Practice is when everything works but no one knows why
• In our lab, theory and practice are combined. Nothing works and no one knows why.
Induction vs. Deduction

- Induction is the development of argument from the specific to the general (or theoretical)
- Deduction is the development of argument from the general to the specific
Reference

Epistemic Attributes (Positivist)

• Internal Validity: the degree to which the changes in the dependent variable are indeed due to the independent variable (is the relationship causal?)
• External Validity: the extent to which the results are generally applicable (outside the sample population)
• Reliability: the extent to which the research finding can be repeated by the same researcher/experiment
• Replicability: the extent to which the findings can be repeated by another researcher (also objectivity)
## Attributes (Modern)

<table>
<thead>
<tr>
<th>Traditional construct</th>
<th>Underlying issue</th>
<th>Replace with</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal validity</td>
<td>Truth value</td>
<td>Credibility</td>
</tr>
<tr>
<td>External validity</td>
<td>Applicability</td>
<td>Transferability</td>
</tr>
<tr>
<td>Reliability</td>
<td>Consistency</td>
<td>Dependability</td>
</tr>
<tr>
<td>Objectivity</td>
<td>Neutrality</td>
<td>Confirmability</td>
</tr>
</tbody>
</table>
# Academic Research vs. Management Study

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Academic Research</th>
<th>Management Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>External validity</td>
<td>The results can be applied more widely than the unit of research (company or individuals)</td>
<td>The results are only valid to the specific company or individual</td>
</tr>
<tr>
<td>Theory</td>
<td>Builds new theory or tests existing theory</td>
<td>Applies theory but at a simplistic level</td>
</tr>
<tr>
<td>Source of background knowledge</td>
<td>Mostly recent peer-reviewed literature</td>
<td>Mostly trade articles and other management studies</td>
</tr>
<tr>
<td>Teleology</td>
<td>Seeks causative relationship</td>
<td>Focussed on improvements and results</td>
</tr>
<tr>
<td>Methodology</td>
<td>Seeks novelty (insights)</td>
<td>Replication of proven formulas for success</td>
</tr>
</tbody>
</table>
Class Work

• Fill in three dimensions of the line below

Scientific Knowledge ─────────────────────────────────── Faith

Evidence is important

Objectivity is important

Sentiment (how it makes you feel) is important
Test Yourself

• There appear to be two opposing epistemological positions on the relationship or interdependence between science, society and the individual:
  – relativism which situates science as merely one socially constructed way of knowing among others of equal validity
  – realism, which accords science a greater status as a universally true body of knowledge.

• Realism has been cast as ignoring the influence of social factors on science. Relativism has been pronounced to be impractical and ignorant of the existence of many fundamental laws which are observable independent of the observer.

• Explain the debate between the two epistemological viewpoints, why relativism is considered impractical and suggest how a compromise may be possible.
Research Design

- What is it?
Several Types of Research Design

• Qualitative vs quantitative vs mixed methods (see Lecture 2)
• Types of designs
  – Experimental
  – Surveys
  – Case studies
  – Ethnographic studies
  – Evaluation research
  – Participatory action research (actually a separate paradigm)
Research Philosophies and Design

- **Positivism**
  - Deductive
  - Quantitative
  - Experiments, Surveys

- **Interpretivism**
  - Inductive
  - Qualitative
  - Interviews, Ethnography, Grounded Theory

- **Critical Realism**
  - Abductive (Retroductive)
  - Qualitative and/or quantitative
  - Archival research, historical analysis +

- **Postmodernism**
  - Abductive
  - Qualitative
  - Discourse analysis, visual methods +

- **Pragmatism**
  - Abductive
  - Quantitative and/or qualitative
  - Any of the above in any combination