Session Two: The Research Question and Proposal

Professor David Walwyn
A Reminder

• Where are we heading?
  – from start to finish ... how do we undertake a research project, especially in the management sciences?

• In Session 1, we have covered some theory
  – what are the types of research (knowledge) and their associated assumptions?

• Session 2 covers ...
Session Two: The Research Question and Proposal

- Defining the research question (the research idea) and problem statement
- Phrasing the research objectives
- Framework of a research proposal
- The initial theory and past research review
- The research design and project plan
A Reminder ....

- Areas of necessary competence to complete your Masters degree:
  - extensive awareness of the field of research in which you will be engaged
  - a thorough grounding in research methodology, particularly the chosen methods for the study
  - evidence of rigorous, independent and critical thinking, particularly in analysing and defining the problem
  - ability to organize the study and the write-up, including writing lucidly
Defining the Research Question and Problem Statement

• This is a very important aspect of research projects
  – an iterative process .... good research questions are informed by a deep understanding of the problem obtained through initial research and review of existing knowledge
  – you cannot develop new knowledge unless you know what has already been developed (where is the knowledge frontier?)

• Some research questions are impossible to answer (why am I here?)
  – the ultimate question is a balance between its ‘answerability’ (can you collect the data?) and its contribution to useful knowledge (is it relevant and novel?)
Key Aspects of the Proposal

- **PROBLEM STATEMENT**
  What is the problem that the research will address?

- **RESEARCH OBJECTIVES**
  What are the objectives of the research?

- **RESEARCH QUESTIONS**
  Given the objectives, what are the research questions?

- **RESEARCH PROPOSITIONS AND HYPOTHESIS**
  What statements/hypothesis are being offered for consideration or testing?

- **RESEARCH DESIGN**
  How will the research data be acquired and analysed?
Example

Problem
More than 40% of HIV-positive persons are lost-to-care (do not return for treatment after diagnosis)

Objective
To understand the socio-economic reasons for the high rate of lost-to-care

Research Question
What are the proportions of lost-to-care by age, income group, race, education and gender?

Research Proposition
The low rates of retention are driven by a combination of gender, age and education

Research Design
Secondary data analysis based on information from primary health clinics
Characteristics of a Good Research Proposal

• The research problem is clearly and concisely stated
  – it is significant (relevant) to an important issue (social, economic, etc.)
  – there is good evidence for the problem
• The objective of the research is clearly defined
• There is a strong link between the problem and the research questions
• The methodology is clear and valid
  – proposed work will be focused, systematic and logical
Characteristics (2)

• The research is located within an existing body of academic work
  – gap in theory or application
  – it is not a management study (see later)

• The benefits of the research are explicit and clear
  – the impact pathway is practical and plausible
  – the proposal has relevance and a rationale

• The assumptions are not unreasonable
It also helps if ...

- The research question is of GREAT interest to you!
- The project can be delineated (fits within your time and budget resources)
- It builds on existing capabilities in your institution (not re-inventing the wheel)
- You have an excellent mentor or supervisor
- You can find a suitable supervisor, preferably in the GSTM
In Your Project You MUST Comply With ....

• The research question is located within the engineering, project or technology management sciences (not hard science)
• The research can be completed in 8 months
• The project can be considered as academic research (see next slide)
  – it is not a management investigation (see Research Guide)
• The research question has relevance (to a broad range of stakeholders)
## 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>
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</tbody>
</table>
Research and Theory

- Application, validation and development

![Graph showing the extent of new theory in Mini-Dissertation (MEM or MBA), Full Masters Dissertation, and PhD Thesis. The graph illustrates the progression of theory building, testing, and application.](image-url)
Phrasing the Research Objective and Questions

• Consider the objective as the main deliverable of your research project
  – must deal with the overall research problem

• Separate sub-studies required for each question
  – imagine a WBS with each question being its own mini project
  – define the methodology for each question if necessary (secondary vs. primary research, etc)
  – no more than 5 questions
# Good and Bad Questions

<table>
<thead>
<tr>
<th>Good</th>
<th>Bad</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relational</td>
<td>Broad and vague</td>
</tr>
<tr>
<td>Empirical</td>
<td>Philosophical meandering</td>
</tr>
<tr>
<td>Aetiological (correlation and causation)</td>
<td>Non-causal correlation or relationship</td>
</tr>
<tr>
<td>Existing or past system</td>
<td>Future (speculative)</td>
</tr>
<tr>
<td>Frequency, difference or correlation questions</td>
<td>Policy issue only with limited link to theory</td>
</tr>
<tr>
<td>The question must have the potential to create new knowledge</td>
<td>The question is an excuse to fill a gap in your knowledge</td>
</tr>
<tr>
<td>Exposes new understanding</td>
<td>Yes/no answer only</td>
</tr>
</tbody>
</table>
Questions Based on Different Approaches to Research

• As a class exercise, analyse these pictures and develop two research questions per photo seeking to explain its remarkable features as follows:
  – Photo One; positivist (structural engineer) and phenomenologist (religious experience)
  – Photo Two; positivist (statistician) and phenomenologist (experience of the moment)
  – Photo Three; constructivist (psychologist) and positivist (public health)

• How would you apply the principles of triangulation in each case?
Photo One: Kyaiktiyo Pagoda

- According to legend, the Golden Rock is tethered by a strand of the Buddha's hair
- A glimpse of the "gravity defying" Golden Rock is believed to be enough of an inspiration for any person to turn to Buddhism
Photo Two: Eric and the Lion
Photo Three: Celebration of Churchill
Research Hypothesis

• A hypothesis is a tentative proposition (prediction or explanation) posited as a methodological guide for researching a problem

• 3 types of hypothesis
  – Research hypothesis (deductive argument)
  – Working hypothesis (inductive argument)
  – Null and alternate hypothesis (generalisation of sample data to population, thereby establishing significance based on rejection or acceptance of the hypothesis)

• Only used in quantitative research (in the strict sense)
Good Hypotheses

• Simply stated
• Testable using standard empirical techniques
  – stated in terms of objectively measurable variables
  – relate to available and accepted research techniques
• Logically derived from available evidence and theory
• Located within existing body of knowledge
Framework for a Research Proposal

- See structure of Research Idea; Assignment 1
  - load the template
- See structure of Research Proposal; Assignment 2 (will be covered in the lecture 7)
# Overall Scheme

## Structure of the GSTM Mini-Dissertation Research Process

<table>
<thead>
<tr>
<th>YEAR 1</th>
<th>YEAR 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Semester 1</strong></td>
<td><strong>Semester 2</strong></td>
</tr>
<tr>
<td>Research Methodology (INI 800)</td>
<td>Literature Review (ILS 801)</td>
</tr>
</tbody>
</table>

### YEAR 1

1. **Research idea** (March)
2. **Research proposal** (May)
3. **Draft Ch 1 to 4** (end Aug.)
4. **Final Ch 1 to 4** (end Oct.)

### YEAR 2

5. **Outline Ch 2** (end July)
6. **Ch 1 to 5** (end May)
7. **Draft report** (end July)
8. **Draft article** (end Aug.)

9. **Research ethical submission** (early Feb.)

10. **Final report & article** (end Sep.)
11. **Symposium** (Nov.)
12. **Symposium** (May of following year)

**Notes:**
- 5: Allocation of supervisors and start of supervision until the completion of research.
- 6: Meeting with Supervisors during the contact days for ILS 801.
- 7: Submission by students that needs only feedback from supervisors.
- 8: Submissions by students that needs grading by supervisors.
Problems with Assignment 1/2

• Commencing a research with a pre-determined path and solution

• Misconstruing the research as
  – an expression of one’s opinion and creativity
  – a technical or engineering project
  – a management study

• Not enough literature work
  – major statements not supported by evidence from the peer-reviewed literature
  – inadequate outline of existing theory and background concepts

• Selecting a complex research idea for postgraduate level (too many broad research questions)
Examples of Questions (Previous Years)

• Problem Statement:
  – The objective of this section is to define the research problem statement. Hence, the focus of this research is to develop a recycling method and processing technologies, leaving a less hazardous residue. The key strategy is to minimize as well as reuse the volume of such hazardous waste.

• Research Questions:
  – What will the recovery of zinc cost vs. the cost of disposal?
  – How much will it cost to build a plant that will treat the silo dust before recycling into smelting process?
  – What are the prospects of recycling silo dust back to smelting process?
  – Will the recycling of silo dust be beneficial?
Asset Management

- Problem Statement: Preliminary investigation suggests that there is no connection between maintenance activities carried out in local authorities and the organisational goals.

- Questions:
  - Does the organisation have a maintenance strategy?
  - What components should be included in a maintenance strategy for local authorities?
  - How should a maintenance strategy support the organisation’s strategy?
  - How to gain acceptance of the maintenance strategy among stakeholders?
Technology Management (Diffusion)

• Problem Statement
  – it appears that in RSA some industries have not realized the potential benefits of using XX to compliment operations; traditions skills and knowledge are relied upon and new technologies are unfamiliar or not trusted

• Objectives
  – to evaluate the disparities in the diffusion (rate of uptake or adoption) of XX between different industries (YY and ZZ) in South Africa
  – to evaluate disparities in the diffusion of XX between South African industries and other countries
Research Questions

- What are the possible benefits and advantages of using XX in industries YY and ZZ?
- What are the possible disadvantages?
- Are there disparities in the diffusion of XX in YY and ZZ?
- What reasons exist for the disparities between the industries?
- Are there disparities in the diffusion of XX between South Africa and other countries within the same industries?
- What are the reasons for the disparities between SA and other countries?
## Consistency Matrix

<table>
<thead>
<tr>
<th>Research Question</th>
<th>Literature</th>
<th>Data Collection</th>
<th>Data Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>What was the cost of the REI4P over its first four rounds?</td>
<td>Walwyn et al 2015</td>
<td>Archival or secondary data</td>
<td>Time series</td>
</tr>
<tr>
<td>What was the consequence of this investment?</td>
<td>REI4P Report 2015</td>
<td>Archival or secondary data</td>
<td>Time series analysis</td>
</tr>
<tr>
<td>What is the cost/benefit ratio?</td>
<td></td>
<td></td>
<td>Correlation analysis</td>
</tr>
<tr>
<td>How does this ratio compare with similar localisation programmes in other countries?</td>
<td></td>
<td></td>
<td>Content analysis to uncover perceptions</td>
</tr>
</tbody>
</table>
E O Wilson TED Talk

• Class Exercise:
  – List the five Wilson rules for becoming a ‘good’ researcher
  – Is Wilson a positivist or constructivist in his approach? Explain your answer
  – Do you agree with him? Explain.

• Other sites:
  – https://www.youtube.com/watch?v=_0HxMpJsm0I&t=2s