Designing and Planning your Research

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Hello

Research Design

Research Design (1)

What is Research Design?

- The planning and structuring of your research investigation
- Conceived to get answers to your research questions
- Provides an outline of what you are planning to do
  - i.e. from writing a hypothesis to the analysis of the data

Research Design (2)

What is a Research Question?

- A statement of the problem you are researching
  - presented in the form of a **question**
- It will serve as the focus of your investigation
- A *good* research question will:
  - find the direction of the project
  - narrow the scope of research
  - define an investigation and set its boundaries

Research Design (3)

Good Research Questions

- Four essential characteristics for a research question:
  - feasible
  - clear
  - significant
  - and, ethical

Research Design (4)

Aims and Objectives

- Your research question will influence the *aims and objectives* of your project
- An aim will describe the main goal of your research project
  - this can be the research question
- Objectives are points that will help you answer the question(s)
  - divides your aim/question into several smaller parts

Aims

- Your aim should be made up of three parts, answering the following questions:
  1. **why** is this research required?
  2. **what** is the research about?
  3. **how** are you going to go about doing it?
- Aims are not limited to just one, similar to how you can have multiple research questions

Objectives

- Objectives should be **SMART**:
  - specific
  - measurable
  - achievable
  - relevant
  - and, time-bound

Research Design (5)

Steps to Designing your Research

- There are six steps to follow when designing your research:
  1. Consider your aims and approach
  2. Choose a type of research design
  3. Identify your population and sampling method
  4. Choosing your data collection methods
  5. Plan your data collection procedures
  6. Decide on your data analysis strategies

Research Design (6)

Consider your Aims and Approach

- Research should be driven by your aims and priorities
- Start off by thinking about what you want to achieve
- Decided whether your research is **qualitative** or **quantitative**
  - qualitative allows the research to be more flexible and inductive
  - quantitative tend to be more fixed and deductive
- Possible to use a mixed approach combining both methods
  - you can gain a more complete picture of the problem
  - strengthen the credibility of your conclusions

Research Design (7)

Choosing a Type of Research Design

- Both quantitative and qualitative approaches have several research designs
- Each type of research will provide a framework to shape your research

Quantitative Research Design

1. Experimental
   - test casual relationships
   - subjects randomly assigned to groups
   - conducted in a controlled environment
2. Quasi-Experimental
   - test casual relationships
   - no random assignment to groups
   - comparing outcomes of pre-existing groups
3. Correlational
   - test whether variables are related and how strong
   - variables are measured without influencing them
4. Descriptive
   - used to describe characteristics, averages, trends etc.
   - variables are measured without influencing them

Qualitative Research Design

1. Case Study
   - detailed study of a specific subject
   - data is collected using a variety of sources and methods
   - focuses on gaining an understanding of the case
2. Grounded Theory
   - aims to develop a theory inductively
   - analyses qualitative data
3. Phenomenology
   - aims to understand a phenomenon
   - describes a participants lived experiences

Research Design (8)

Identify your Population and Sampling Method

- Clearly define who or what your research is focusing upon
- State how you will go about choosing participants or subjects
- A **population** is the entire group you want to draw conclusions about
- A **sample** is a smaller group of individuals who you will collect data from

Defining a Population

- Generally made up of anything you wish to study
  - i.e. organisations, research paper, animals etc

Sampling Methodologies

- With a narrow population, it is challenging to collect data from every participant
- Sampling is a useful approach, performed in one of two approaches:
  1. Probability:
     - sampling via random methods
     - used mainly in quantitative methods
     - enables a strong statistical inference about the population
  2. Non-Probability:
     - sampling via a non-random method
     - used in both qualitative and quantitative methods
     - easier to achieve, but there is a greater risk of bias

Research Design (9)

Choosing your Data Collection Methods

- A method of directly measuring variables and gathering information
- Provides you first-hand knowledge and original insights into your research problem
- You may do one data collection method, or multiple:
  - e.g. surveys, observations or media

Primary Data

- This is data collected by the researcher
- Often referred to as “real-time” data
  - the data is collected when the research is being undertaken

Secondary Data

- This is data collected from other researchers
  - i.e. data sets from Kaggle, or other research papers
- You provide your own analysis on the raw data
  - this can be done to answer new research questions not originally addressed from the study
- Expand the scope of your research
  - access larger and more varied data samples
- There is a lack of control over the variables measured or how they were measured

Research Design (10)

Plan your Data Collection Procedures

- Think about how you will execute the methods of data collection
- You will want to collect data that is **consistent**, **unbiased** and **accurate**
- Have a systematic approach to your qualitative research
  - define your variables and make sure your measurements are valid and reliable
- Ensure that the results collected are *reliable* and *valid*
- Create a data management plan
  - how will you store the data?
  - how will it be organised for easy retrieval?

Research Design (11)

Decide on your Data Analysis Strategies

- Raw data will not answer your research question
- You will need to consider analysing the data collected

Qualitative Data Analysis

- Data will often be dense with information and ideas
- Instead of summing it up via numbers, you'll have to go through the data in detail
  - i.e. interpret its meaning and identification of any patterns
- You may also need to extract relevant parts of your research question
- Common approaches towards this type of analysis:
  - **thematic**: focuses on the content of the data and involves coding/organising the data to identify key themes
  - **discourse**: puts the data into context by analysing different levels of communication
    - i.e. language, tone and structure etc.

Quantitative Data Analysis

- Some form of statistical analysis will be performed
  - i.e. summary of the sample data, estimations and test hypotheses
- *Descriptive statistics* can be used to summarise sample data by looking for the:
  - distribution of your data
  - central tendency of the data
  - variability of the data
- *Inferential statistics* can be used to:
  - estimate the population based on the sample data
  - test hypotheses for a relationship between variables
- The choice of test employed depends on the aspects of your research design

Goodbye

Goodbye (1)

Questions and Support

- Questions? Post them in the **Community Page** on Aula
- Additional Support? Visit the Module Support Page
- Contact Details:
  - Dr Ian Cornelius, ab6459@coventry.ac.uk
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