

The Research Process: An Eight step Model

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Research Process: Eight step Model

1. Formulating a research problem (Deciding)
2. **Conceptualizing the research design**
3. **Constructing an instrument for data collection (Planning)**
4. **Selecting a sample**
5. **Writing a research proposal**
6. **Collecting data**
7. **Processing Data (Doing)**
8. **Writing a research report**

1. Formulating a research problem (Deciding)

1. Reviewing the literature

2. Decide what you want to find out about? (Formulating a research problem)

3. Identifying variables

4. constructing hypotheses

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1.1 Reviewing the Literature

- Place of ***Literature Review*** in research:
 - Broadens your knowledge base in your research area
 - Brings clarity and focus to your research area
 - Improves your conceived methodology
- Procedure for reviewing the literature:
 1. Search for existing literature in your area of study
 2. Review the literature selected
 3. Develop a theoretical framework
 4. Develop a conceptual framework

1.1 Reviewing the Literature

- Searching the existing literature:
 - Keeping in mind a vague idea of the research problem you want to undertake, the following sources are useful for searching the existing literature:
 1. Books
 2. Journals
 3. Conferences' proceedings
 4. Other electronic documents (such as Patents, RFCs etc.)
 5. Web Pages
 6. Seminars

1.1 Reviewing the Literature

- Reviewing the literature selected:
 - Start Reading the **Material** selected (is it literature review?)
 - No ! So, read critically with reference to the following aspects:
 1. Note whether the knowledge relevant to your theoretical framework is confirmed
 2. Note the theories presented, the criticisms of these theories, the methodologies adopted to counter/confirm them (e.g. study design, sample size, measurement procedures etc.).
 3. Examine to what extent the findings can be generalized for other situations
 4. Examine the differences of opinion among other researchers and try to formulate your opinion about the validity of these differences

1.1 Reviewing the Literature

- Develop a theoretical framework:
 - After reviewing the literature you may find that the problem you wish to investigate has its roots in a number of theories that have been developed from different perspectives.
 - The information obtained from different books and journals now needs to be sorted under the main themes and theories, highlighting agreements and disagreements among authors and identifying the unanswered questions or gaps.
 - Use these aspects as a basis for developing your theoretical framework.

1.1 Reviewing the Literature

- Developing a conceptual framework:
 - The conceptual framework stems from the theoretical framework which becomes the basis of your study.
 - It describes the aspects you selected from the theoretical framework to become the basis of your inquiry.
 - Hence, the conceptual framework is the basis of your research problem.

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1.2 Formulating a research problem

- Decide what you want to find out about !
- Sources of Research Problems:
 1. People
 2. Problems
 3. Programs
 4. phenomena

1.2 Formulating a research problem

- Considerations in selecting a research problem:
 1. Interest
 2. Magnitude
 3. Measurement of concepts
 4. Level of expertise
 5. Relevance
 6. Availability of data and resources
 7. Ethical issues

1.2 Formulating a research problem

- Steps in the formulation of a research problem:
 1. Identify a broad field or subject area of interest to you
 2. Dissect the broad area into subareas
 3. Select what is of most interest to you
 4. Raise research questions
 5. Formulate objectives
 6. Assess your objectives (feasibility in terms of time, resources , data availability etc.)
 7. Double check (go back and give final considerations)

1.2 Formulating a research problem

- Formulating the objectives:
 - Main objectives
 - Overall statement of the thrust of your study
 - The statement of the main associations and relationships that you seek to discover or establish
 - Sub objectives
 - Should be listed numerically
 - Each sub objective contains only one aspect of the study

1. Formulating a research problem (Deciding)

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1.3 Identifying variables

- The definition of a variable:
 - We all make value judgements constantly in our daily lives.
 - E.g. “this food is *excellent*”, “I could not sleep *well* last night”, “I think this is *wonderful*”
 - These are judgments based upon our own preferences, indicators or assessments.
 - Therefore, the basis on which they are made may vary from person to person.
 - These preferences are called **concepts**.

1.3 Identifying variables

- Now let us consider these examples:
- “This program is **effective**”, “This is a **waste** of time”, “this product is not doing **well**”, “we are providing a **quality** of service to our clients”
- These are not preferences. Rather, they are **judgments** that require a sound basis on which to proclaim.
- **This warrants the use of a measuring mechanism and it is in the process of measurement that knowledge about variables plays an important role.**
- An image, perception or concept that is capable of measurements– hence capable of taking on different values– is called a **variable**.

1.3 Identifying variables

Types of Variables:

- Variables can be classified into a number of ways. These include:
 - In terms of the casual relationship
 - In terms of the design of the study
 - In terms of the unit of measurement

1.3 Identifying variables

Types of Variables:

From the viewpoint of Causation:

1. Independent Variables

- Change variables
- Responsible for bring about change in a phenomenon or situation

2. Dependent Variables

- Outcome-effect variables
- Brought by some other independent variable/s

1.3 Identifying variables

Types of Variables contd:

From the viewpoint of Causation:

3. Extraneous Variables

- Several other factors operating in real life situation which may affect changes in the dependent variable.
- These factors, not measured in the study, may increase or decrease the magnitude or strength of the relationship between the independent and dependent variables.
- The unmeasured variables affecting the cause-and-effect relationship.

1.3 Identifying variables

Types of Variables contd:

From the viewpoint of Causation:

4. Intervening Variables

- Also known as the confounding variables
- Links the independent and dependent variables
- In some situations, the relationship between the dependent and independent variable cannot be established without the intervention of another variable.
- Hence, the variables that link the cause-and-effect

1.3 Identifying variables

Types of Variables contd:

From the viewpoint of the study design:

1. Active Variables

- These variables can be manipulated, changed or controlled

2. Attribute Variables

- Those variables which can not be manipulated, changed or controlled
- They reflect the characteristics of the study population
- E.g age, gender, education, income etc..

1.3 Identifying variables

Types of Variables contd:

From the viewpoint of the unit of measurement:

1. Categorical Variables

i. Constant

- When a variable can have only one value or category e.g car, building, water etc.

ii. Dichotomous

- When a variable can have only two categories as in binary data (0/1), yes/no, good/bad, beautiful/ugly, low/high

iii. Polytomous

- When a variable can be divided into more than two categories e.g Religion (christian, muslim, hindu, budhist), days of week (Sun, Mon, Tues..)etc..

1.3 Identifying variables

Types of Variables contd:

From the viewpoint of the unit of measurement:

2. Continuous Variables

- When variables have continuity in their measurements
- Then can take on any value on the scales they are measured
- E.g. temperature, age, time, income, etc..

1.3 Identifying variables

Types of Measurement Scale:

1. The nominal or classificatory scale

- Enables the classification of individuals, objects or responses based on a common/shared property or characteristic.
- Each subgroup (class) has a characteristic/property which is common to all classified within that subgroup.
- E.g. Religion:
 - Islam
 - Christian
 - Hindu
- Gender:
 - Male
 - Female
- Day_of_the_week:
 - Sunday
 - Monday
 - Tuesday
 -

1.3 Identifying variables

Types of Measurement Scale:

2. The Ordinal or Ranking scale

- The ordinal scale has all the properties of a nominal scale plus one of its own.
- Besides categorizing individuals, objects or a property into subgroups on the basis of a common characteristic, it ranks the subgroups in a certain order.
- Subgroups have a relationship to one another. They are arranged in ascending or descending order.
- E.g. Income:
 - Above average
 - Average
 - Below Average
- Attitudes:
 - Strongly favorable
 - Favorable
 - Uncertain
 - Unfavorable
 - Strongly unfavorable

1.3 Identifying variables

Types of Measurement Scale:

3. The Interval Scale

- An interval scale has all the characteristics of an ordinal scale (which also includes a nominal scale), plus it has a unit of measurement with an arbitrary starting and terminating point.
- The unit of measurement enables the individuals or responses to be placed at equally spaced intervals in relation to the spread of the variable.
- Since the starting and terminating points are arbitrary, they are not absolute; that is, you can not say that 60 degree Celsius is twice as hot as 30 degree Celsius. Therefore, no direct mathematical calculations are possible.
- E.g. Temperature:
 - Celsius 0° - 100°
 - Fahrenheit 32° - 212°
- Attitudinal Scale:
 - 10 – 20
 - 20 – 30
 - 30 – 40
 - 40 – 50

1.3 Identifying variables

Types of Measurement Scale:

4. The ratio Scale

- The ratio scale has all the properties of a nominal, ordinal and interval scales plus one of its own.
- The zero point of a ratio scale is fixed, which means it has a fixed starting point.
- The fixed starting point can be any value, but mostly it is 0. Therefore it is an absolute scale since the difference between the intervals is always measured from a zero point (starting point).
- Thus, the ratio scale can be used for mathematical operations.
- E.g. Income:
 - 0\$ --
- Age:
 - 0--
- Temperature in Kelvin scale
 - 0--

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1.4 Constructing Hypothesis

The definition of Hypothesis:

- A proposition, condition, or principle which is assumed, perhaps without belief, in order to draw out its logical consequences and by this method to test its accord with facts which are known or may be determined.
- A proposition that is stated in a testable form and that predicts a particular relationship between two or more variables. If we think that a relationship exists, we first state it as a hypothesis and then test the hypothesis in the field
- A hypothesis could be either:
 - Right
 - Partially right
 - wrong

1.4 Constructing Hypothesis

The functions of a hypothesis:

- To conduct a research study requires a hypothesis but it is not **essential** ingredient.
- However, a hypothesis is important in terms of bringing clarity to the research problem. It serves the following functions:
 - Provides a study with focus
 - Tells you what data to collect
 - It enhances the objectivity in the study
 - Enables to formulate a theory since it helps in concluding what is true or what is false

1.4 Constructing Hypothesis

The characteristics of a hypothesis:

- A Hypothesis should be simple, specific and clear.
- A hypothesis should be capable of verification.
- A hypothesis should be related to the existing body of knowledge.
- A hypothesis should be operationalisable.