Important terms in research, development of objectives and hypothesis

DCE3002 Research Methodology

The research process

THE RESEARCH PROCESS – THE EIGHT STEP MODEL
(Adapted from Kumar, 2005, p. 19)
Common Research Problem:
• Lack of Research
• Some of the phenomena is still unexplained
• Inconsistencies in findings
• Methodological problem in mist research

By getting answers to those research questions, the study goals are met and a contribution towards solving the problem is made (Leedy & Ormrod, 2005 in Ellis & Levy, 2008).

What else do you have to know and formulate after stating your study objective?

- Know the study variables.
- Define your study variables – Conceptual and operational definition
- Identify your theory/model
- Formulate your study proposition/research hypothesis
**Important terms**

- **A concept** is an accepted collection of meanings or characteristics associated with certain events, objects, conditions, situations, and behaviors.
  - Involves classifying & categorizing that have common characteristics beyond a single observation
- Clarification of concepts are through definitions.
  - Conceptual definition – defines the meaning of the concept.
  - Operational Definition - defines a variable in terms of specific measurement and testing criteria.
    - Operational definition may vary depending on the purpose and the way you choose to measure them.
Conceptual vs. Operational Definition

- Importance of understanding concept
- Importance of developing operational definition.
  - Guide our research
  - Describes exactly how we are going to measure/manipulate the variable of study

Example:

- **Conceptual definition**: Job satisfaction
  - a pleasurable emotional state resulting from the appraisal of one's job.

- **Operational definition**: Job satisfaction
  - A person's feeling toward his salary, supervisor, work condition and colleague.
More examples....

- **Conceptual definition**: Self-efficacy
  - self-efficacy is defined as individuals' beliefs about their capabilities to produce designated levels of performance (Bandura, 1994).

- **Operational definition**: future work self-efficacy
  - individuals' beliefs about their future capabilities to produce designated levels of performance at work.

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**Example of Conceptual and Operational Definition**

Counterproductive Work Behaviors

A frequently used framework for discussing CWE is that of Fox and Spector (1996) who suggested that behaviors can be categorized around the target of the behavior: the organization (CWB-O) and other individuals (CWB-I); see also Robinson and Bennett (1995). Two previous analyses of contract breach and CWB (Bozic et al., 2008; Tett et al. 2000) have found contract breaches to relate to both CWB-O and CWB-I.

However, Berry et al. (2003) note that while this is a commonly used categorization scheme, it is not the only one in the literature. In their meta-analysis, while supporting distinctions between CWB-O and CWB-I, Berry et al. (2007) noted that various levels of specificity in describing CWE may be of use depending on the research question involved. Collapsing all CWE into two categories may eliminate meaningful variance in predicting subcategories of behavior. In addition, not all types of CWE necessarily have the same antecedents (Spector et al., 2009). Thus, we include five categories of CWE as defined by Spector et al. (2009) (hostility toward others, production deviance, sabotage, theft, and withdrawal).

What is a variable?

- A concept that can be measured (Kumar, 2005)
- A property that can take on different value (Kerlinger 1986).
- A variable is a characteristic that can take on different values.
  - Variable vs constant
  - Constant – characteristic that is same for every member
  - Example:
    - Variable: Gender, CGPA, attitude
    - Constant: Study undergraduate student. Status of the student as undergraduate.

A Variable

(A Characteristic or Attribute)

**Measured**

(Can be assessed on an instrument and recorded on an instrument)

**Varies**

(Can assume different values or scores for different individuals)

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Converting concepts into variables

- Variable serve as an indicator to the concept.

<table>
<thead>
<tr>
<th>Concepts</th>
<th>Indicators</th>
<th>Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rich</td>
<td>Income</td>
<td>Gross Salary per annum</td>
</tr>
<tr>
<td></td>
<td>Asset</td>
<td>Value of house and car owned</td>
</tr>
<tr>
<td>Effectiveness</td>
<td>Productivity</td>
<td>Quantity of produced per day</td>
</tr>
<tr>
<td></td>
<td>Quality</td>
<td>Number of customer complaints</td>
</tr>
</tbody>
</table>

SOURCE CREDIBILITY

- Expertise
  - Formal Education
  - Experience
- Status
  - Job Title
  - Mode of Dress
- Objectivity
  - Involvement in Outcome

Variable:
- Level of Education
- Years of service

Concept:
- More Abstract
Types of Variable

- Independent variable (IV) – the variable that is responsible for bringing about change in a phenomenon/situation.
  - Also known as predictor variable, exogenous variable
- Dependent variable – the outcome of the change brought about by the IV.
  - Also known as outcome variable, endogenous variable.

Other important terms

- A **proposition** is a statement about observable phenomena that may be judged as true or false. (supported by theory and past research)
- A **hypothesis** is a proposition formulated for empirical testing. (supported by theory and past research)
- A **theory** is a set of systematically interrelated concepts, definitions, and propositions that are advanced to explain or predict phenomena.
- A **model** is a representation of a system constructed to study some aspect of that system.
Hypothesis

- A logical supposition, reasonable guess.
- A conjectural statement of relationship between two variables (Kumar 2005)
- A tentative statement/prediction to show the relationship between two or more variables which can be generate from deduction (Ahmad Mahdzan, 1995)
- Provides a tentative explanation for a phenomenon under investigation

Its role is to:
- Guides the direction of a study
- Identifies facts that are relevant and those that are not

Hypothesis though important are not essential for a study
- Formulated in QUANTITATIVE STUDY

Testing of a hypothesis

3 steps:

- **Step 1** Formulate your hypothesis
  - Theory
  - Past research

- **Step 2** Collect the required data

- **Step 3** Analyze your data to draw conclusion about your hypothesis
  - Hypothesis is supported or not supported
Characteristics of hypothesis

- Must have explanatory power
- Must state the expected relationship between variables
- Must be testable
- Should be consistent with the existing body of knowledge
- Should be stated as simply and as concisely as possible

Research hypotheses: Types

- Null hypothesis \((H_0)\)
  - No change in the dependent variable
  - Example: There will be no significant difference in test scores between fifth-grade boys and girls on the XYZ achievement test.

- Directional alternative hypothesis (Research hypothesis) \((H_a)\)
  - Specifies the direction of the change in the dependent variable the researcher predicts will take place
  - Example: Fifth-grade girls will have higher scores on the XYZ achievement test than fifth-grade boys.
Further example of hypothesis (Which one is null & alternative hypothesis?)

- There is no difference in academic achievements between gender
- There is a difference in academic achievements between gender
- There is no relationship between emotional intelligence and academic achievement
- There is a positive relationship between emotional intelligence and academic achievement

Research Hypotheses

- Guidelines for writing
  - State the variables in this order: independent (first position), dependent (second position), and control (third position)
  - When comparing, explicitly state the groups; if variables are related, specify the relationship between the variables
  - Make a prediction about changes you expect in your groups.
  - State information about the participants and the site unless it repeats information stated in your purpose statement (Optional)
- Formulate Hypothesis based on theory & past research.

Educational Research: Planning, Conducting, and Evaluating Quantitative and Qualitative Research, third edition

John W. Creswell
Example

- There is a **negative relationship** between *psychological contract breach* (IV) and *employee organizational commitment* (DV).

- **Support Research Hypothesis** (H₁):
  - A negative relationship exist between psychological contract breach (IV) and employee organizational commitment (DV).

- **Does not support Research Hypothesis** (H₀):
  - No relationship exist between psychological contract breach (IV) and employee organizational commitment (DV).

Errors in hypothesis testing

- **Hypothesis** is an assumption that you want to prove whether it is correct or incorrect.

- You may make a conclusion that:
  - the assumption is correct (but it is actually incorrect)
    - Reject Null Hypothesis – Accept Alternative Hypothesis
    - Conclude: A relationship exist between PYC breach and employee commitment (**actually no relationship exist**) 
    - **TYPE I ERROR**
  - The assumption is incorrect (but it is actually correct)
    - Accept Null Hypothesis – Reject Alternative Hypothesis
    - Conclude: No relationship exist between PYC breach and employee commitment (**actually relationship exist**) 
    - **TYPE II ERROR**
Reasons for such errors

- Faulty study design
- Faulty sampling procedure
- Inaccurate method of data collection
- Wrong analysis
- Inappropriate statistical procedure

What you need to do:

- Write your study objective.
  - To describe....
  - To describe.....
  - To compare .....  
  - To determine......

- Write your hypothesis of study.
Kump 1: Religiosity

General study objective:
The purpose of this study is to examine gender, religiosity and workplace deviance among law enforcement personnel.

Specific study objective:
Specifically this study shall:
- Describe the level of religiosity among law enforcement personnel. (your independent variable)
- Describe the level of workplace deviance among law enforcement personnel (your dependent variable)
- Compare the workplace deviance among law enforcement personnel by gender
- Determine the relationship between religiosity and workplace deviance among law enforcement personnel.

Kump 2: Psychological Contract Breach

General study objective:
The purpose of this study is to examine gender, psychological contract breach and workplace deviance among law enforcement personnel.

Specific study objective:
Specifically this study shall:
- Describe the level of psychological contract breach among law enforcement personnel. (your independent variable)
- Describe the level of workplace deviance among law enforcement personnel (your dependent variable)
- Compare the workplace deviance among law enforcement personnel by gender
- Determine the relationship between psychological contract breach and workplace deviance among law enforcement personnel.
Kump. 3: ethical leadership

- **General study objective:**
  - The purpose of this study is to examine gender, ethical leadership and workplace deviance among law enforcement personnel.

- **Specific study objective:**
  - Specifically this study shall:
    - Describe the perception of ethical leadership among law enforcement personnel. (your independent variable)
    - Describe the level of workplace deviance among law enforcement personnel (your dependent variable)
    - Compare the workplace deviance among law enforcement personnel by gender
    - Determine the relationship between ethical leadership and workplace deviance among law enforcement personnel.

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**Hypothesis**

- **Kumpulan 1**
  - Hypothesis 1:
    - Male law enforcement personnel tend to commit more workplace deviance compared to female law enforcement personnel
  - Hypothesis 2:
    - There is a negative relationship between religiosity and workplace deviance

- **Kumpulan 2**
  - Hypothesis 1:
    - Male law enforcement personnel are more susceptible to workplace deviance than female law enforcement personnel
  - Hypothesis 2:
    - There is a positive relationship between psychological contract breach and workplace deviance

- **Kumpulan 3**
  - Hypothesis 1:
    - Pegawai penguatkuasa lelaki lebih cenderung dalam melakukan tingkah laku devian di tempat kerja berbanding dengan pegawai wanita.
  - Hypothesis 2:
    - Terdapat hubungan negatif antara kepimpinan beretika dengan tingkah laku devian di tempat kerja.