Research Methodology
By Dr Geoffrey Nambira
Source consulted

Available from “Book Den” Behind One Africa Television
Section 1 Contents

• 1. Sources
• 2. What is research?
• 3. What is scientific knowledge?
• 4. The nature of science
• 5. Source of scientific knowledge
• 6. Sources of non scientific knowledge
PART 1: What is research?

- *Research* is a scientific and feasible method to generate important, reliable and quality information which can be very helpful for making better decisions, plan and develop programs, policy formulations, design intervention, create new knowledge, etc.

- The process that involves obtaining scientific knowledge by means of various objective methods and procedures (Welman et al., 2005, p.2)

- The process of using scientific methods to expand knowledge in a particular field of study (Welman et al., 2005, p.3)
Research is...?

- **Objective:** no influence from personal feelings or opinion in making judgment or drawing conclusion from the findings
- **Research methodology:** explains logic behind research—it is wider in scope: it includes methods and research designs
- **Research methods includes:** quantitative, qualitative, mixed methods, and research designs such as case study, experimental, quasi-experimental, non experimental
- **Research techniques are specific ways used to conduct research and collect data e.g. sampling, data collection procedures (scales of measurements, the use of close and open ended questions, interview guides, probe, participant observation, observation, checklists mailing/administering of survey questionnaire), methods of data analysis (qualitative or quantitative data analysis, software used e.g. SPSS, Excel, ATLAS.TI etc.)
What is scientific knowledge?

- Systematic observation (oppose to selective observation): scientific observation is a systematic, well planned way of building knowledge
- Selective observation is paying attention to information that support our assumptions (it subjective)
- Control: is elimination of alternative explanations in obtaining results (it is objective)
- Replication: means repeatedly obtaining the same results by other researchers/possibility of replicate the same results
Nature of science

• Science is not defined by equipment or things a person use.
• It is defined by things a person tries to accomplish and the kind of thinking involved using the tools of scientific thinking.
• Scientific thinking, approaches questions systematically.
The goals of science

• There are different types of science such as behavioral science, social science, pure science

• Commonly, each seek to find answers to questions in a scientific way
Source of scientific knowledge

• There are various ways that contribute to understanding of goals of science

• 1. **Description/systematic observation**: to describe the phenomenon one need to observe and record what happens thus fulfilling the goal of science

• Some description are personal, subjective and controlled (qualitative)

• Some are objective and controlled (Quantitative)

• 2. **Prediction**: observation and description leads to predictions

• Predictions is saying what will happen next before seeing or observing a phenomenon
Source of scientific knowledge.....

• If two things go together one can use another one to predict the other. For example (Soul respond to questions when you ask him to do so without raising his hand - then you do so)

• 3. Explanation: giving a coherent set of reasons why a particular thing happened the way it did and not any other way

• Research is thus useful for testing the explanations. For example (Why are female employees discriminated against at work place?)
Source of scientific knowledge...

• **4. Control:** the goal of science is to control
• To control is to make things happen in a particular way
• Scientific research differ from the social research in a way that you cannot control humans (e.g. controlling staffs/workforce moving to greener pasture)

• **5. Replication:** implies similar research results should be obtained by other researchers
• Replication is expansion of scientific knowledge to reach a conclusion
Sources of non scientific knowledge

• 1. Authority: entails knowledge originated from renowned scholars or experts (they tend to defend aggressively their viewpoint about reality. However the source must be examined)
• 2. Opinion of peers: entails acquired knowledge from peers
• 3. Traditions: entails knowledge carried over and over - not questionable
• 4. Debating: entails engaging in discussions seemingly in logical manner
• 5. Accidental observation: entails making conclusions about a phenomenon observed without reasoning the reality
Part 2 Contents
Alternative approaches to research

1. Nature of knowledge
2. Positivists perspectives
3. Post/Anti positivists perspectives
Part 2 Contents
Alternative approaches to research

- **Nature of knowledge:**
  - research is based about the world around us (philosophically termed Ontology)
  - Disagreement on how we come to know or nature of knowledge is termed epistemology
  - For the purpose of increasing our understanding on these disagreements we will discuss positivism, constructionism, critical realism and pragmatism

- **Positivism:**
  - Science and research is seen as a way to get the truth
  - There is an objective truth
  - The world operate by law of cause and effect
  - They use deductive reasoning to put forward theories that they can test by fixed, predetermined research design and objective measures
  - The key approach of positivists researchers is experiment
  - Knowledge beyond directly observation and objective measurement is impossible
  - Generalisation of the findings
Alternative approaches to research: Nature of knowledge ....

**Constructionism:**
- Constructionism critique the positivist that there is an objective truth
- They hold the belief that the world is fundamental mentally constructed
- Constructionists don’t search for objective truth
- Constructionists aim to understand the rules people use to make sense of the world by investigating what happen in peoples minds
- They emphasis on how people construct knowledge
- It looks at the accounts people give on issues, topics and how they come to these accounts (interaction with others is important)
- Understanding of a specific case is essential than generalisation of the findings
- There research techniques are focus groups and unstructured interviews
- Thus there is no objective reality to generalise

**Critical realism:**
- This is a combination of belief in external reality(Objective) with rejection that external reality can be objectively measured and observed (e.g. satisfaction, culture, motivation) that always have subjective interpretations
- Critical realism is critical about our ability to understand the world with certainty
- While positivist beliefs that the aim of science is to uncover the truth, critical realism believes that the goal of research is to progress to this goal
Alternative approaches to research: Nature of knowledge ....

- **Critical realism**:....
  - Their viewpoint is that measurement of phenomena is subjective and collection of data is flawed
  - Furthermore the researchers are inherently biased
  - They propose the use of triangulation

- **Pragmatism**:  
  - Pragmatists believe that both objective observed phenomena and subjective meaning can produce useful knowledge  
  - The focus of pragmatism is on practical applied research where the focus is in solving problems  
  - Thus research is a process where concepts and meanings (theory) are regarded as generalisations of past actions, experiences, and interaction with environment  
  - It emphasises on social constructed nature of research (different researchers may have different ideas, opinion about the reality)  
  - Thus different idea, opinions, theories helps to understand the world  
  - Pragmatism endorse eclecticism and pluralism  
  - Pragmatism sees present truth as tentative and changing over time  
  - Thus, the purpose of theory is to inform practice
Positivists approach

- Distinction between epistemology and methodology
- Epistemology is a philosophy of knowledge or how we come to know (a philosophy)
- Methodology is specific ways used to understand the world (practice)
- Positivism is a belief in empiricism (observation and measurements are core of science)
- Positivists approach is based on philosophical approach known as logical positivism
- Logical positivism is a natural science method in human behavioural research
- Logical positivists presuppose that research must be limited to what can be observed and measured objectively
- Knowledge produced by research should be independent from the opinions or feelings of individuals
- Natural science try to develop laws that are applicable and valid to a larger population
- Such laws explains the cause of objectively observable reality/behaviour
- Thus, positivist focus their research on observed and measured human behaviour
Post/Anti positivist approach

- Post positivists argue that it is inappropriate to follow a strict natural scientific method in collecting and interpreting data.
- It argues that natural science method is suitable for studying molecules and not reality being study.
- Observation and measurement are fallible (imperfect).
- Observation are theory-laden, so scientist or everyone else is biased by culture experiences and world view.
- Phenomenologists contends that Human experience being studied cannot be separated from the reality a person is experiencing (critical realism).
- In post positivist approach, a researcher don’t distance him/her self from the phenomenon being studies.
- Post positivist are constructivists. Which is a process of constructing views of the world based on perceptions of it.
- Post positivist approach, focus their research on experience of human behaviour.
Part 3 Contents: The research process 1

- 1.0 Identifying a research topic
- 2.0 Defining research problem
- 2.1 Develop research objectives
  - 2.1.1 Develop research questions and hypothesis
  - 2.1.2 Significant of the study
  - 2.1.3 Limitation
  - 2.1.4 delimitation
Identifying research topic

• **Topic formulation**

• *“well begun is half done”* Aristotle quoting an old proverb

• After identifying or defining the problem statement it is now time formulate the topic for study

• Selection of topic is based on:

• 1. practical problem in the field

• *For example, why nurses experience back injuries; manager suffer from stress related ailments?; why prominent business personnel abuse drugs? What causes low job performance among employees at GPRN company?*

• 2. literature in a specific field of study

• *After reading different literature, the thought of expanding or refining previously read literature and research findings emanates*
Identifying research topic....

- 3. request for proposals from companies, GRN agencies NGOs, etc. (RFPs)

- *RFPs describe the problem, the context it operates, the approach they would like you to take to investigate the problem and of cause the money*

- 4. Create or think up own topic

- *Essential to know that no one lives in vacuum. The topic you might create might be influenced by your background, culture, education and experiences*
Identifying research topic.....

• 5. Course work
• During studies, student have direct interactions with the lecturers and that influences the topic of study
• 6. The type of job a person does influences the choice of a study topic
• 7. Different personal interests influences the choice of study topic
• 8. The choice of a study topic in some cases is influenced by the general experience the person/research might have gone through
Defining statement of the research problem

• Statement of the problem emanates from:
  • Personal observation and experience
  • Controversy or different opinions
  • Practical problems
  • Previous research
• Cause and effect relationship basis on the theory or previous research findings
Defining the statement of the research problem

• A statement of the problem is a “..declarative statement but may be in a question form” (Best and Kahn, 1989, p.36)

• Examples: ‘Lack of fringe benefits specifically at the Mahangu Mill Company has detrimental effect on the level of production among its work force’ ‘To what extent does the lack of fringe benefit at the Mahangu Mill Company affect the productivity level among its workforce?’

• Previous research:
  • ‘Relationship between family size and poverty levels’; ‘Leadership style influence on productivity’; ‘Market orientation’s influence on business performance’; ‘Relationship between customer service levels and customer satisfaction’

• Research problem is narrowing down general interest in a research topic into a problem
Defining the statement of the research problem......

• Some pertinent questions when attempting to develop a statement of problem...
• What is the problem?
• What is the best way to solve the problem?

A good statement of the problem or question should:
• Express relationships between variables
• Be clearly stated
Defining the statement of the research problem......

• Variable = a characteristic of the study object
• Dependent variable (Y): is affected by one or more independent variables
• Dependent variable is simply called an ‘outcome variable’
• Independent variable (X): affect the dependent variable or helps to explain the variance in dependent variable(Y)
• Independent variable is simply called a ‘predictor variable’
• moderating variable: When relationship of independent variable and dependent variable depend on another variable
• Intervening or mediating variable surface when independent variable start operating
• Intervening variables affects the dependent variable
• e.g.

- Work force diversity
  Independent variable
- Creative synergy
  Intervening variable
- Organisation effectiveness
  dependent variable

- Managerial expert
- Moderating variable
Note: The top white area represents INDEPENDENT VARIABLES and the bolded area the DEPENDENT VARIABLES

Examples of Independent and Dependent variable in a typical survey questionnaire

Company name ..........................................
Year of work experience in the position (1) 1-5 years (2) 6-10 years (3) 11-15 years (4) 16 and above 1= not at all 2= sometimes 3= always

<table>
<thead>
<tr>
<th>Question/content</th>
<th>Items choices</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. To what extend do managers consult employees in making decisions about fringe benefits?</td>
<td>Only when they is a strike</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>When the board instruct them to do so</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>When they intend to rise their fringe benefit and other packages</td>
<td></td>
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Develop research objectives

- Research objectives are “Clear specific statements that identify what the researcher wishes to accomplish as a result of doing the research” Saunders et al.,(2009, p. 680)

- The objective should be clear, realistic, manageable, achievable and measurable

- Research objectives are written by using ACTIVE verbs such as to identify, to investigate, to examine, to draw conclusion, to evaluate, explore, assess, etc

- The objective of which the research intends to achieve emanates from the statement of the problem
Developing research questions/problem

- Welman et al. (2005) Used research question and problem synonymously
- Research questions/problem are always in a question form
- Research question/problem refer to difficulties researchers experiences practically or theoretically-seeking for solution
- Research question/problem expresses relationship between two or more variables
- The few examples of research questions/problems are:
  - ‘Why does poverty appear more often in some communities than in others?’
  - ‘Which programme are likely to promote socio-economic development?’
- Commonly in the above questions/problems is that some variables are the cause of others for example poverty versus type of community, programme versus socio-economic development
To formulate and articulate research questions and hypotheses, we can start from the following:

- Understand the broad research theme
  - Have an extensive research review (literature)

- Take your previous experience and knowledge as hypotheses
  - Ask about current status quo

- Identify outcome measure and its relationships with other factors
  - Examples:

  - previous study: 1) Higher salary level requires higher degree, 2) men on average makes more money than women

  - research questions: 1) what are the difference in degrees held in the same jobs by gender? 2) how does the relationship between salary level and degree differ by gender?
Research hypothesis

- Hypothesis is a tentative assumption or preliminary statement about the relationship between two or more aspects of a specific problem
- A hypothesis is a specific statement of prediction
- It is a statement or proposition that can be tested by reference to the empirical study or theory
- Null hypothesis ($H_0$): there is no relationship. It describes the possible outcomes other than the alternative hypothesis. Example (Trochim et al., 2008, p.8) *as a result of the XYZ company employee-training programme, there will be no significant differences in employee absenteeism.*
- Alternative hypothesis ($H_A$): there is a relationship. It is a statement of prediction that states what you expect will happen in your study; example: *as a result of the XYZ company employee-training programme, there will be a significant decrease in employee absenteeism.*
Research hypothesis

- One tailed hypothesis: is “A hypothesis that specifies the direction; for example when your hypothesis predicts that your program will increase the outcome”

- In stating the relationship between groups or variables in a directional hypothesis the terms used are ‘positive, negative, more than, less than and the likes’

- These terms indicate the direction of relationship

- Examples of directional hypothesis:
  - “the greater the stress experienced in the job, the lower the job satisfaction of the employees”
  - “women are more motivated than men”

- Two tailed hypothesis: is “A hypothesis that does not specify a direction. If the program or intervention will have an effect on outcome but you are not willing to specify whether it is positive or negative” (Trochim et al., 2008, p.9)
Research hypothesis

- Non directional hypothesis do postulate the relationship or differences but offer no indication of the direction of these relationship.
- This means that you may not be able to say whether the relationship is positive or negative.
- Examples of non-directional hypothesis:
  - “There is a relationship between age and job satisfaction”
  - There is a difference of the work ethics between men and women employees”
Research hypothesis

- Null and alternative hypothesis:
- Hypothetico-deductive method require that hypothesis are falsifiable. Meaning that they must be written in such a way that researchers can show them to be false
- Hypothesis are accompanied by null hypothesis labeled as $H_0$
- Null hypothesis reject to accept the alternative hypothesis $H_A$
- Null hypothesis is presumed to be true until statistical evidence in hypothesis testing prove it otherwise
- Null hypothesis show there is no relationship between variables or groups
- Furthermore, the null hypothesis assumes that there is no relationship in a population characteristics and the sample we studied
- Null hypothesis is the theory that allow us to have faith on the alternative hypothesis that is in particular a center of research investigation
- The null hypothesis in terms of group differences such as “women are more motivated than men” the statistical null hypotheses is $H_0 : \mu_m = \mu_w$ or $\mu_m - \mu_w = 0$
- Where $H_0$ is null hypothesis and $\mu_m$ the mean motivational level of the men and $\mu_w$ the mean motivational level of the women
Research hypothesis

- Alternative hypothesis is labeled $H_A$
- It is the opposite of the null hypothesis
- The statistical hypothesis of alternative hypotheses is $H_A : \mu_m < \mu_w$ the same as $\mu_m > \mu_w$
- For non-directional hypothesis such as ‘there are differences between the work ethics values of men and women’ the null hypotheses would be: $H_0 : \mu_m = \mu_w$ or $H_0 : \mu_m - \mu_w = 0$
- Alternative hypothesis would be $H_A : \mu_m \neq \mu_w$

Steps in testing the null hypotheses:
1. state the null hypotheses
2. choose the appropriate statistical test (t, F, x²) depend on whether the data collected are parametric or nonparametric
3. determine the level of significant desired ($p=0.05$ or more, or less)
4. see the results in computer output indicate the significant level is met or not
Hypotheses......Measurement error

- Type I and II error
- There are two types of errors related to null and alternative hypotheses
  1. Type I error occurs when decision is made that something is true while it is not
  - It might involve concluding two variables are related while they are not
  - Or incorrectly conclude that sample statistics exceeds the value it would be expected by chance alone
  2. Type II error occur when researcher conclude two variables are not related while they are
  - That the sample statistics does not exceed the value that would be expected by chance alone
  - Researchers consider type I error more serious and prefer to take small chance to say something is true when it is not
  - It is important to minimise type I error than type II
Significance/Importance, limitation and delimitation

- **Significance**: It is an attempt by the researcher to point out solutions to the problem or answer questions that can influence theory and practice.

- It is further a demonstration on why it is worth the time, efforts and expense required to carry out a proposed research.

- **Who will benefit from the study?** How will they benefit?

- **Limitation**: these are conditions beyond control of the researcher that may negatively impact the conclusion of the research.

- **Delimitation**: these are boundaries of the study. e.g. a study on social grant will only be concerned with low social income groups, pensioners or unemployed population, implications of designs, method, sampling and data collection procedures.
Part 4 Contents: Research process 2

3.0 Literature review
3.1 Theoretical and conceptual framework
Planning the literature search

- Define the parameters of your search: your statement of the problem, the research objectives and the research questions/problem will determine the parameter of the literature search
- Generate key words and search terms: key words are basic words that describe statement of the problem, objective, and research questions/problems
- Technique for selecting key words: discussion with colleagues, supervisor, librarian, dictionaries, encyclopedia, handbooks and brainstorm
- Discuss your idea as widely as possible
- Source of literature search: primary (letters, memos, minutes), secondary (books, journal, publications.) and tertiary (library catalog, indexes, abstracts, online, databases, government publications, www, citations and reference lists,)
How recent is the item?
Has the item been superseded (out-of-date)?
Is the context different/similar? How?
Have you seen previous references to this item?
Does the item support/contradict your arguments? How? Why?
Does the item appear to be biased?
What are the methodological omissions?
Is the phrasing of the information (precision) sufficient?
Significance of reviewing related literature

- It can provide important facts that are essential to your study
- To avoid duplication of previous research
- To provides dimensions of studies that were not studied before
- To allows development of the study domain
- To get insights into strengths & weaknesses of other studies
- To know-how (knowledge) and how to proceed with study
- To provides basis for relationships & measurements
- Previous study findings can be related to current study
- To provides motivation
Writing the review

- Orientate yourself psychologically
- Start with a plan
- Emphasize relationships in literature
- Attempt a critic approach
- Acknowledge your sources properly
- Discuss literature; don’t reproduce it
- Summarize your main contributions
- Your 1st effort will not be the last
- Use fellow students/academics for feedback
Writing review.....synthesize sources

- Compare & contrast theoretical perspectives
- Indicate how topic has changed over time
- Describe general trends in research findings
- Identify discrepancies & contradictions
- Identify general themes in literature
Theoretical and conceptual framework

• Theoretical framework: is a critical exploration of theories related to your topic of study. For example using the key word ‘marketing theories’, ‘demand and supply”, ‘company logistics’ one should be able to retrieve a number of theories of interest to your study.

• Examples of theories: Role theory, communication theory, contract theory, historical cost principles, demand and supply, Maslow theory etc.

• Conceptual framework: is the relationship among variables or concepts in a study which the researcher will operationally study in order to achieve the set objectives and respond to research questions, hypothesis or assumptions

• The definition of variables was given in slide 30 and 31 of this presentation

• Concepts: are building blocks of a theoretical model. They are representing an object, a property, or certain phenomenon

• E.g. cost income, market share, business property are common concepts in business
Theory...........concepts....

- Concepts serve as:
  - 1. foundation of communication: implying if they are no set of agreed concept, communication is impossible
  - 2. concepts introduce a perspective: a way of looking at empirical world
  - 3. means of classification and generalization

- Conceptual definitions: these are definitions that describe concepts using other concepts e.g. productive=ability to produce vigorously

- Concept are essential in any theory model because they direct that what is captured e.g. supply and demand are key concepts in economics

- Operational definitions: descriptive explanations of individual concepts and how they can be measured e.g. following the conceptual definition for productive as mentioned above, productive can be measured by noting the number of packets parked, time taken to accomplish a task (packing), the quality of produce etc.
Theory

- Theory: is a group of logical, related statements that is presented as an explanation of a phenomenon.
- It includes more than one concept and links the concepts.
- Theories are concerned with:
  - Causal relationship: a situation where one variable is regarded as the cause of another if it precedes the latter.
  - Correlation relationship: a situation where changes of the one variable is associated with changes in another, but not necessarily the cause of it to change.
  - Theories and research problems deal with relationship between variables.
  - Variables in human behaviour theories and research problems qualify as constructs.
  - Construct: a created abstract concepts of a collection of concrete forms of reality (e.g. attitude, management style, socioeconomics status, problem solving).
Theory…………deductive and inductive

An hypotheses can be derived from a theory

- To derive implications deductively from a theory is to formulate a statement that must be valid if the theory is valid.

- To investigate a theory implication, one should deductively infer research hypothesis to theory.

- Deductive research: refer to research which a conceptual and theoretical structure is developed and tested empirically (moving from general to particular).

- Inductive research: refer to a study in which theory and conceptual structure is developed from observation of empirical reality and general influences are induced from particular instances (moving from particular inference/assumption to general).
Schematic presentation of Deductive reasoning/research (top bottom approach)

1. **Theory**
2. **Start with the theory**
3. **Hypothesis**
4. **Narrow the theory down to hypothesis**
5. **Observation**
6. **Collect observation to address the theory/test the hypothesis**
7. **Confirmation**
8. **Confirm/Not the theory**
Schematic presentation of Inductive reasoning/research (bottom up approach)

1. **Observation**
   - Begins Specific observations and measures

2. **Pattern**
   - Detect patterns and regularities

3. **Tentative hypothesis**
   - Formulate tentative hypothesis that can be explored

4. **Theory**
   - Develop general conclusions or theories
Examples of Deductive and Inductive Reasoning

Here is a valid deductive argument:

It’s sunny in Windhoek. If it’s sunny in Windhoek, he won’t be carrying an umbrella. So, he won’t be carrying an umbrella.

Here is a mildly strong inductive argument:

Every time I’ve walked by that dog, he hasn’t tried to bite me. So, the next time I walk by that dog he won’t try to bite me.
Theory ………… deductive and inductive (Three main steps in the research process)
Part 5 contents: Research process 3

Determine how to conduct your study

- Research paradigm: this entails the scientific practice based on people’s philosophies and assumptions about the world and nature of knowledge
- One need to make a choice between qualitative, quantitative or mixed methods
- The choice of research methodology can be determined by research problem, the assumption we use in our research and how we define the research problem
Part 6 contents: Research process 4

Analysing and interpreting the research data

- The tools of analysis of data that will be used depends on whether we have collected qualitative or quantitative or mixed data

- For example interviews, in-depth interview, focus group interview, observation, participant observation will yield qualitative data unless quantified

- Survey questionnaire with exception of open ended questions build in it, will yield quantitative data

- Case study will yield qualitative data

- For quantitative data, researchers use SPSS, excel, SAS etc. (these are software)

- For qualitative data we use Atlas
Part 7 contents: Research process 5

Writing the report

- Remember the sections that we have covered makes the $1^{st}$ and $2^{nd}$ chapters of your proposal and when expanded they become part of your research project.

- **The draft report starts right at the beginning of the project especially the proposal and continue doing so until it is completed.**
TYPES OF RESEARCH
Basic and Applied research

- Source: Zikmund et al., (2013)
- **Basic research** is also referred to as pure research
- It is conducted without specific decision in mind
- It does not address the need of specific organisation
- It is not aimed at solving a particular problem
- It attempt to expand the limit of knowledge
- Basic business research can be used to test validity of the general business theory applicable to all businesses (e.g. motivation, effectiveness of financial management system, absenteeism)
- Such research provide ideas to managers on how to improve the situation and use the findings to design applied research
- **Applied business** research is conducted to address a specific business decision for a firm or an organisation
- The applied business research in an organisation differs from basic business research in the sense that:
- 1. The need for research in industry emanate from organisational problem (absence of employees, staff retention or attrition, financial control, job dissatisfaction etc.)
2. To improve the effectiveness of the organisation (for example profitability, utilise human talents, reduce waste materials)

3. Study the employees or job applicants

4. Results are positive and usable

5. When conclusion are acceptable they are implemented by the rest of the organisation or company
Historical and Case study Research

- **Historical research**: Historical research involves locating the past preserved records, past events and evaluating them.
- Evaluated source are synthesised and interpreted to suggest causal explanations for the events or practices.
- Example criminal investigation, auditing etc.
- Historical research is not concerned with collecting new information, finding new explanations or interpretation of the existing information.
- The first step in historical research is statement of the problem which are the main theme of the study.
- Principles of HR: Preference to primary sources rather than secondary sources.
- Stringent criticism: external (*authenticity of a source*); internal (*accuracy or credibility of source*).
- Causal explanations (*by means of inductive logic*): replicability (*ability to duplicate*); internal validity (*eliminate alternative explanations*); sampling (*accidental sampling*).

Disadvantages: Typical flaws: *excessive dependence on secondary sources; succumbing to personal bias of researchers*.
Inability to explain reasons why some past events occurred.
Four key problems: *inferring causality based on correlational relationships; terms have had their present meanings also in the past; failing to distinguish between document sources & relevancy to society in the past; tendency to deduce intentions of historical figures from the consequences as we observe them in hindsight*.

- **Case study research**: in case study, the study is not directed by hypothesis but by the underlying uniqueness and particularity of the case.
- The objectives of the case study is to investigate the dynamics of the single case system, typical social nature, family, institution, project etc.
Case study research has limited number of “units of analyses”

- Units of analysis can be “typical” or “a-typical”
- Typical: representative of the population
- Atypical: not being common to phenomena being studied

Case study research require fieldwork for the groups

Research procedure: *participant observation* and *unstructured interviews*

3 important aspects of case study research: *case should be demarcated (defined); search inductively for recurring patterns and regularities; triangulation is frequently used*
Types of Research…..

- **Action research**: Conducted with the view of finding a solution to a particular practical problem.
- The approach is a bit similar to the case study research and applied research.
- Action research differ from the case study research in the sense that it does not simply describe the case but also searching for the solution to the problem situation.
- Action research does not involve any theory or derive hypothesis from the theory.
- A theory is used to suggest solutions to the existing problem situation.
- It thus, does not test the theory.
Phenomenological research

• Role of researcher: not the reality, but the interpreted reality that is observed (researcher becomes part of the group or situation which is observed) (positivist versus anti-positivist views)

• Context of the study: life-world concept – “the world as lived by a person and not some entity separate from or independent of him/her”

• Aims of research: the description of phenomena considering the participant’s experience of these phenomena

• Research design & methods: no research design as in quantitative research; emergent designs – data collection may be adapted as the study continue (dynamic)
Participatory research

Involves integration of:

- Social investigations
- Educational work
- Action in an interrelated process
Distinguishing factors

• Participants are actively involved in the planning and implementation of the research outcomes and they are thus empowered

• Researcher is dependent on the participation of members in order to bring about social change
RESEARCH DESIGN
Research design

- Research design is the plan according to which one obtains research participants and how information is collected from them
- It is a description on what we are going to do with the participants in responding to the research questions/hypothesis
- Research design specify:
  - Number of groups to be used
  - How they will be assigned/obtained from the population (randomly, purposefully etc.)
  - What should be done with them

- **Population:** It is the study object
  - It consists of individual groups, humans, organisations, events, or condition which they are exposed etc…
  - Encompasses the total collection of “units of analysis” of which researcher want to make specific conclusion
  - Population is the full set of cases from which the sample is taken
Research design……

• In sampling, the term population is not used in normal sense as full set of cases. It is not necessarily be people
• For example if you want to study micro lending system in Windhoek the population where you will select your sample will be all micro lending institutions
• Population is indicated by “N” (For example N=120)
• We refer to members of element of the population as unit of analysis
• In behaviour sciences units of analysis are humans, groups (e.g. business personalities), organisations, human products, events (demonstrations)
• Sample:
• Since the size of the population may be big, it is impossible to study the entire population. The participants must be selected or sampled
• Sampling is a process of selecting a small representatives participants from the population who could be studied
Research design......

• Sample must be representative of population if the results have to be generalised

• Representative sample is the miniature image of likeness of the population

• If the sample is not accurate representatives of the population, the results are applicable to only people who participated in the study
Research design……Sampling frame

- The researcher should draw a sample of the population to obtain clarity about the population to which the hypothesis apply
- This involve compiling sampling frame
- Sampling frame is a complete list in which each unit of analysis is mentioned only once
- The sample is representative of the sampling frame which ideally the same as the population

To be able to compile appropriate sampling frame we can follow this Checklist:

- Are the cases in sampling frame relevant to your topic (are they current)?
- Is sampling frame complete (contain all cases)?
- Does the sampling frame exclude irrelevant cases (is it precise)?
- Can you control exactly how sample will be selected?
Research design……

Sampling: there are two main sampling techniques namely **probability** and **non-probability** sampling

Probability samples is to determine that probability of any element in the population will be included in the sample

Classes of sampling techniques are:

1. **Simple random sampling:** each member of the population has equal chance of being selected or included in the sample

   We can use random tables, assign unit of analysis to number e.g. 001 if the population has three digits or 01 for two digits (see Welman, Kruger & Mitchell random tables)

2. **Stratified random sampling:** if the population has various non-overlapping subpopulation that differ from one another in a variable or a combination such as gender and age (two strata = men and women), each subpopulation is stratum

   - The stratum must be included when drawing a random sample
   - There are two steps to be considered when drawing a representative stratified sample
1. identify various strata according to one or more variables
2. draw random sample from each separate stratum

The advantage of stratified sample is such that there is great proximity of including men and women from a variable such as gender. Where else the proportion of men and women selected using simple random sample might decrease the chances of having men and women in the sample

- **Other types of probability sampling:**
  1. **Systematic sampling:** selecting the sample systematically by $N/n$ where $N$ is population size and $n$ is a sample size
  2. **Cluster sampling:** since it is difficulty to obtain a list of all unit of analysis in a big survey the cluster sampling is more convenient

Cluster sampling involve drawing the stratified random sampling of homogeneous groups
Research design......population and sampling

2. Non Probability/incidental sampling

- Non probability sample can not be specified
- Certain members have no chance of being selected or included in the study. As such the findings can not be generalised
- Types of non probability/incidental sampling:
  - I) Quota sampling: the system of having the same proportion of unit of analysis from the strata such age, gender, experience, etc., in a population
  - The unit of analysis is obtained accidentally from a particular stratum (it is termed segmentation)
  - II) Purposive sampling: selection a sample/unit of analysis regarded as representative of the population based on the past experience, previous research
  - III) Snowball sampling: approach few individuals in a population and the few identify others for inclusion in the sample, thus the sample grow in size like a snowball
  - IV) Self-selection sampling: self identification by individuals in the research
  - V) Convenience sampling: haphazardly sampling or selecting of cases that are easy to obtain
Research design......population and sampling

- **Sample size:**
- We can generalise the data of the study using probability sampling based on probability.
- The larger the sample size the lower the probability error in generalising to the population.
- Probability sampling compromise between the accuracy of the findings and the amount of time and money spent.
- The choice of sample size is governed by:
  1. the confidence we need to have in our data (representation of the population)
  2. the margin of error we can tolerate
  3. type of analysis we are going to undertake
- When determining sample size \((n)\) we should keep in mind:
  1. the size of the population \((N)\). Thus, for satisfactory results to be obtained, the small the total population is the larger the sample should be.
  2. The influence of \((n)\) instead of proportion \(N/n\) to the population size \(N\) is related to standard error of the mean.
Research design……population and sampling

- Therefore number of \( n \) is more important than the percentage of the total population (e.g. for a population 10,000 if the \( n = 20 \) the standard error will be 2.24, if \( n = 1000 \) the standard error will be 0.30)

- Sampling error is the difference between the sample characteristics and the population to which the sample is drawn

- 2. the desired sample size does not depend on the size of the population only but also on the variance (heterogeneity) of the variable

- As a rule the larger the variance of the variable the larger the sample which is required

- 3. if each stratum of a highly heterogeneous, population is relatively homogenous, it is sufficient to consider a relatively smaller stratified sample than that required for a random sample

- If strata differ in size and heterogeneity, we should adjust size of sample from them

- The small the stratum and/or more heterogeneous, the lager the sample size we should draw

- 4. in determining sample size we should bear in mind that the number of units of analysis might be smaller than the number we drew originally due to refusal to participate, provide wrong address etc. to avoid this draw larger sample than required
Response rate

• With probability sample, we need to obtain as high responses rate as possible to ensure a representative sample
• Non-responses may occur due to:
  • Refusal to answer
  • Ineligibility
  • Non-location/non-contact
• Response rate should be included in a research report
• Total response rate/active response rate
• The formula: total response rate = total number of respondents / total number of in sample (ineligible)
• The most common calculation is called active response rate
• Formula is: active response rate = total number of responses / total number in sample – (ineligible + unreachable)
Sampling error

Sampling error:

No matter how hard the researcher tries, it is impossible to select a sample that perfectly represents the population.

Should the researcher select the whole population, he/she will not make inference based on the small representative population.

Sampling error: can be defined as the difference between the characteristics of the sample and the population from which the sample was collected.

Sampling error represents the lack of fit between sample & population.

Sampling error is measured in amount of variability (unevenness-spread of average values).

Thus, the larger the diversity of sample values, the large the error and the less the precise the representative the sample is.
Four types of research design

- There are four types of research designs namely Experimental, Quasi-experimental, Non-experimental and qualitative research designs.
- The first three constitute quantitative research design and the last is qualitative research design.
- **Experimental research design:**
  - Experimental design involves intervention.
  - In experimental design, the influence of independent variable on dependent variable is measured as expressed in the hypothesis.

**UNIT OF ANALYSIS**

**INTERVENTION**

**UNIT OF ANALYSIS**
Four types of research design

- The measurement of independent variable before intervention is called **pre-measurement**.
- The measurement after the intervention is called **post-measurement**.
- In research design where one group is involved we refer to pre-measurement and post-measurement **single-group design**.
- When working with one group design it is not certain to assume that a change has occurred to the dependent variable because of the independent variable. We need a **control group**.
- A control group is the group that is not exposed to intervention but control the nuisance variables.
- A nuisance variable is any variable that may appear but was not mentioned in the hypothesis.
- **True experimental design:**
  - Three characteristics of true experimental research design are to:
    - 1. control over independent variable
    - 2. random assignment of unit of analysis to groups
    - 3. control nuisance variables
Four types of research design

1. Control over independent variables:
   - Possibility to decide which level of the variable we should use
   - For example, learning can be divided into two levels (1) **number of hours** and (2) **period of time**

2. Random assignment of unit of analysis to groups:
   - In true experimental research, different groups are formed by means of random sampling
   - Random means the way groups are assigned to different levels of independent variable (tossing a coin, tables of random numbers)

Three types of randomised designs involve intervention are:

a) Randomised two group design:
   - Assigning participants in two groups subjected to two levels of independent variable Xa and Xb. Groups are matched
   - Xa  Y
   - Xb  Y
   - (X is independent variable and Xa and Xb is the different levels of this variable. Y is the measurement of dependent variable. X appear before Y meaning intervention takes place before measurement)
Four types of research design

B) Randomised multigroup design:
If the independent variable has more than two level, research participants are assigned randomly to many groups as they are levels. And levels are randomly assigned to the groups.
Randomised multigroup design is extension of randomised two group design.

\[ \begin{align*}
X_a & \quad Y \\
X_b & \quad Y \\
\ldots \\
X_c & \quad Y \\
X_d & \quad Y 
\end{align*} \]

C) Randomised pre-test and post test design:

\[ \begin{align*}
y_1 & \quad X_a & \quad y_2 \\
\ldots \\
y_1 & \quad X_b & \quad y_2 
\end{align*} \]

3. Nuisance variable:
True experimental research control variables that were not stated in the hypothesis.
Nuisance variables can be controlled by:
(A) doing proper literature review (B) eliminate the effect of nuisance variables (C) built it in the design as additional independent variable (D) form groups with the same characteristics of the nuisance variable.
Causality conditions in human behavioural science

• We discuss earlier that the purpose of science is to explain phenomenon and the cause of these phenomenon.

• Variable X is regarded as sufficient cause of another Y if:
  • (A) there must be a correlation of the two (B) the cause precede the effect (c)the 3rd variable must be controlled

• 1. Correlation between variable:
  • A correlation association between X and Y exist if Y tend to appear in association with X
  • The existence of relationship even if perfect would not necessarily be an indication that X cause Y. There might be a mutual relationship
  • Mutual relationship means one variable plays a role in the occurrence of another which in turn affect the other

• 2. Cause proceed the effect:
  • To infer relationship, cause must precede effect (e.g. motivation versus academic performance, goal scoring versus viewers applaud ??)

• 3. Control of the third variable:
  • The correlation of between X and Xs precedence of Y is not the only explanation X causes Y
There is third condition for inferring causality (the third variable ‘Z’)

We should exclude all other factor except that investigated

This principle of excluding other factors is called ‘ceteris paribus’ in Latin meaning ‘everything else being the same’

‘Ceteris paribus’ is the same to the principle of ‘falsification’ meaning knowledge accumulate through elimination of ‘rival hypothesis’ or alternative explanations
Laboratory versus Field studies

- Laboratory experiment (studies) exerts maximum control of groups studied and characterised by artificial world situation
- Field situation (studies) conducted in actual environment
- Field studies has many external factors that operate as nuisance variables
- Uncontrolled nuisance variables may exert an influence
Quasi-experimental Research

- In experimental research we assign subjects randomly to exert control.
- In quasi experimental design we do not randomly assign subjects to different groups.
- In business and administration sciences true experimental design is impossible.
- In quasi experimental research, measures are taken to prevent known threats to internal validity.
- Internal validity describes the degree to which changes in dependent variable are due to independent variable than something else.
- Quasi experimental design prevents alternative to eliminate nuisance variable and rival hypothesis.
- There are two types of quasi experimental research:
  1. non-equivalent control group design
  2. interrupted time-series design
Quasi-experimental Research....

- **Non equivalent control group design:**
  - In non equivalent control group design we use two **pre-existing groups** as experimental and control group.
  - This design is called **ex post facto design** (Spector, 1981).

- Pre-measurement | Intervention | post-measurement

  - **Experimental group**
  - **Control group**

- If experimental and control group don’t differ on pre-measure but on post-measure, intervention was effective.

- Threats to internal validity are historical event, spontaneous development in one or both groups, measurement reactivity, instrumentation and statistical regression.
Quasi-experimental Research....

- **The interrupted time-series design:**
  - In interrupted series more than one measurement is done on dependent variable with equal intervals before and after intervention
  - It is consider as expansion of single group design

- **Intervention**
  - *Experimental group*  
  - *Pre measurement*  
  - *1st  2nd  3rd  etc.*  
  - *experimental group*  
  - *post measurement*  
  - *1st  2nd  3rd  etc.*
Non-experimental Research

• In non-experimental, hypothesis testing research, there is no planned intervention and no random assignment of subjects to groups
• Random assignment cannot occur as subjects cannot be associated in terms of all variables
• In this research one or more variables apart from the independent variable in question may be the cause of observed variation
• Therefore conclusion about the causal relationship may be done with confidence by means of true experimental design

Survey design (relationship between variables):
• In this design we examine the relationship between the two or more variables e.g. gender, age, socio-economic status
• There are many variables that occur together and mutually influence one another

Non-experimental research design involving measurement at a single time
• Three non-experimental design involve measurement at single time namely
• 1. correlation design 2. criterion-group design and 3. cross-sectional design
Non-experimental Research

1. Correlation design
- A single group of unit analysis (prisoners) is obtained preferably randomly
- Each individual is measured on two (film watched –rating and aggressive behaviour) or more variables at more or less the same time
- The relationship between variables is then analysed

2. Criterion-group design
- Sample is drawn randomly from the population representing different levels of independent variables (e.g. male and female)
- The variable qualifies as a classification factor
- The intention is to measure if the groups differ in terms of the dependent variable (e.g. passion killing)

3. Cross-sectional design
- Cross-sectional design is special case of criterion-group design
- Criterion groups typical comprised of age groups (15 years, 21 years, 27 years versus s ethnic hatred of technicon, university or organisational year groups) the groups are known as cohort
- Cohorts are examined in terms of one or more variables at the same time (e.g. ethnical dislike)
Non-experimental Research

- **Longitudinal design**
  - Involves examining the same group at different time intervals
  - This design is relevant if we want to investigate changes due to passage of time (e.g., aggression and introduction of aggressive television program)
  - Longitudinal design are time consuming and expensive
  - There are three types of longitudinal designs:
    1. **Panel design**: a sample is drawn that is more or less representative of the relevant population
    2. **Cohorts design**: Cohort design does not involve representative sample from same or other population
    3. **Trend design**: measure different sample from the same population at different times (voters born in a particular year) rather than same sample at different times

- **Cross-lagged panel design** two or more groups are measured at **two or more different points in time** (e.g. rural and urban vs like of a party)

- **Prediction studies**
  - In prediction studies we measure unit of analysis in terms of one or more variable at one point in time
Non-experimental Research

- The variable are called predictors
- The units of analysis are then measured later in term of another variable
- A prediction study has time dimension as longitudinal design but different variables are measured at different point in time
- There are two types or prediction studies namely:
  - 1. The retrospective design: there is a knowledge of to which criterion groups individual belong
  - The design originate from how the existing criterion groups may have differed previously in terms of one or more variables and may be used as a predictor variable (e.g.) Juvenile delinquency come from broken families)
- In experimental design we expose unit of analysis to cause of action, but we cannot do that in retrospective design
- We begin by observing two or more groups on how they differ in term of dependent variable in the past that may contributed to the present differences
- 2. The prospective design: the design is used to investigate the extent to which future position of research participants on one or more, known as criterion variables may be predicted on the basis of the participant original score on one or more predictors variable(s)
Non-experimental Research

3. Opinion polls

- Opinion poll is example of survey research design
- It does not test hypothesis
- It is a record on what people feel or believe about something
- It can test relationship between preferences or opinion, beliefs and biographical variables such as gender, income, marital status etc.

We may investigate questions such as: ‘Are there any differences on the expectations about the future of Namibia between unemployed males and female Namibian voters?’

Census

- Each of the member of the population is supposed to be included and classified (gender, employment status etc.)
- The objective of census is to determine the approximate number of people in various categories
Factors beyond researcher control

• History (concurrent events that occur over time simultaneously with researcher interventions)
• Spontaneous change (development; deterioration; maturation or recovery of circumstantial events that influence research interventions)
• Other (multivariate nature of human behavioural research)
• Selection: (preexisting differences between experimental and control group - there will be no adequate basis for comparison)
• Interaction between selection & spontaneous change: (even if selected, one group may show spontaneous change than the other)
• Communication between treatment groups
• Differential attrition (mortality/disappear) of participants
Researcher control

• **Matching:**
  - Matching happen where there is strong relationship between nuisance variable and dependent variable
  - Three way in which matching can be done. 1 precision 2. Multiple nuisance variable matching 3. Frequency distribution control

• **Precision control:** (Divide group into pairs so that members of the pairs are similar especial if nuisance variable is known to be similar to the dependent e.g. intelligent/training method and high marks)

• **Multiple nuisance variable matching:** (assign groups of the same IQ equally to groups e.g. Male and female)

• **Frequency distribution control:** (Ensuring that the mean of nuisance variable are the same for different treatment groups)
Qualitative research methods

• It is an approach rather than a design
• It cover arrays of interpretative techniques such as describing, decoding, translate or come to term with meaning of phenomenon
• It is fundamentally a descriptive form of research
• It is useful in describing cases
• *Ethnography method* is part of qualitative research method
• Primary task of ethnographic research is to collect field notes about event in order to uncover reality
• Thus Smith (1992) regarded ethnography, case study, participant observation as same type of research approach
• Ethnographic research originated from cultural and social anthropology
• It is a descriptive research design
• Collecting field notes
• “Uncover and explicate the ways in which people in certain settings understand, account for, take action & manage their situations”
Qualitative research design....

• **Case study research:**
  Consider limited number of unit of analysis
• To investigate groups of institution we make used of field notes
• Participant observation and unstructured interviews are used to study the case
• The mass materials may necessitate content analysis and the small number of personal document by participant observation
• Three important aspects of case study: *case should be demarcated (defined); search inductively for recurring patterns and regularities; triangulation is frequently used*
• Research procedure: *participant observation and unstructured interviews*
• **Participant observation:**
• Research stay in a site for a long time and take part in, report on, the daily experiences of the group
• The researcher is the insider (group member) and not outsider
• *Tasks of the participant observer:* – he is a research instrument, observation notes, record, interprets, analytical notes and methodological notes
Qualitative research design....

- **Participant observation:**
  - Experience group members experience and understand their life-world
  - See things from their perspective
  - Unravel the meaning & significance that they attach to their life-world (including their own behaviours while doing so)
- **Process of participant observation:** obtain permission, disclose objectives
  - anonymy, trust, do not become too involved, write a report, observation notes to be made while group is observed, digital recordings ideal for later references, interpretation to be done continuously, make methodology notes for future procedural reference
- **Unstructured in-depth interviews:**
  - The essence of this approach is
  - 1. Identify important variables in a particular area
  - 2. Formulate penetrating questions
  - 3. Generate hypotheses for further investigation
- **Process of interview:** Compiling field notes (make observations; record observations; plan their participation; ask questions)
Qualitative research design....

- **Unstructured in-depth interviews.............**
- The setting (*consider practical issues of gaining access to the setting*)
- Presenting oneself (*clothing; culture*)
- Build trust and rapport (*relationship*)
- Consider the language and culture differences
- Sexual differences
- **Ethical considerations:**
  - Informed consent
  - Right of privacy
  - Protection from harm
  - Involvement of researcher (*do not manipulate; treat them humanely; no unethical tactics*)
- **Advantage and disadvantages of unstructured interviews:**
  - Useful for exploratory investigations and pretesting of the questionnaire
  - Researchers and interviewers are directly involved (*could be biased*)
  - Time consuming (*not so good*)
Focus groups

- Group in-depth interviews
- Elicit responses between members
- Can be elaborated for “pre-test” of measurement instrument development in quantitative research

- Compiling focus groups:
  - Members selected carefully
  - Participation of “experts” should be well controlled
  - Hostile respondents should be controlled
Sampling and conducting phases focus group interview

• **Sampling of focus group:**
  - Purposive sampling
  - Snowball sampling

• **Conducting focus group:**
  - Researcher introduces topic
  - Researcher sets the rules
  - Each participant makes opening statement
  - Researcher guides discussion by asking questions
  - Session ends with each person giving a final statement
Type of questions in focus group interview

- Main questions: define purpose of investigation
- Leading questions: looking for underlying hidden attitude
- Testing questions: phrase the answer of respondent to activate discussions
- Steering questions: used to guide group back to main theme
- Indirect questions: allow to answer questions about behaviour
- Factual questions: allow respondents to discuss controversial aspects
- Emotional questions: elicit expression of feeling among the respondents
- Anonym questions: asking respondents to describe their thoughts about a topic
Advantages and disadvantages of Focus groups

• Information obtained rapidly
• Researcher communicates directly
• Participants can discuss their opinions
• Interviews can be conducted with those that cannot fill in questionnaires
• Teleconferencing can also be used
• It however often inhibits responses of participants
DATA COLLECTION METHODS AND MEASURING INSTRUMENTS IN QUANTITATIVE RESEARCH
Measurement theory:
Measurement and data collection are based on systematic observation of which the results should be replicable.
We generally measure the dependant variables.
It is easy to measure things/people (length, weight, etc.).
But difficult to measure constructs (e.g. attitude towards paying TV, and affirmative action, socio-economic status etc.).
To measure construct we must identify indicators (e.g. for socioeconomic status, the indicators are income, education, occupation etc.).

Nature of measurement:
Measurement involves assignment of numbers.
Rules in terms of which number are assigned constitute operational definition (e.g. productive: number of hours at work, number of boxes packed per day/hour etc.).
Levels of measurement

• In measurement we distinguish between different level of measurement
• Distinguishability (2 differ from 1)
• Order of rank (2 has a higher rank than 1)
• Equal intervals (0.....1.....2.....3.....4)
• Absolute size (0-1=-1=1-0=1)
• The four characteristics form a hierarchy in sense that the fourth presuppose the third, the second, the first
Measurement

• **Nominal measurement:**
  - Number are assigned to distinguish them in terms of attributes
  - Mutually exclusive: Each person belong to one of the category only. In other words a particular behaviour should fall on one category only
  - Mutual exhaustive: all individuals can be accommodated in some or other category
  - E.g.: Variable “gender” by means of 1 or 0, occupation, job experience

• **Ordinal measurement:**
  - Order individual data
  - Same as nominal, but in order
  - E.g.: occupation variable – 1 for lowest rank; 2 for second lowest rank; 3 for highest rank
Measurement

- **Interval measurement:**
- Has characteristics of both Nominal & ordinal measurement
- Use property of *equal distances* between consecutive numbers
- E.g.: Likert scale – indicate your position regarding following statement by allocating any number between 1 & 7 where 1 = *completely disagree* & 7 = *completely agree*

- **Ratio measurement:**
- Only in ratio measurement there is a fixed and absolute zero point
- There are also *equal differences*
- Any statistical analyses can be used
Measurement reactivity and unsystematic sources of variation

- Faking (participants deliberately distorting results in order to create a desired impression)
- Socially desirable responses (subjects deliberately provide responses that they believe to be socially acceptable)
- Acquiescence (the phenomenon where participants tend to consistently answer “yes” or “no”)
- Test-retest reliability (administer it at least twice)
- Parallel-forms of reliability (interchangeable versions)
- Internal consistency (Cronbach/coefficient alpha) (high degree of generalisability across items)
- Split-halves reliability (correlating scores of 2 halves)
- Interrater/intercoder/tester/test or measurement-scorer reliability (accidental inconsistent behaviour of person administering the tests)
Measurement reactivity and unsystematic sources of variation…….

Response styles:
• Halo effect: rating individual high/low because of favourable or not favourable
• Severity or stringency error: rating very strictly or leniency
• Error of central tendency: rating not strictly or leniently but in the middle
• Logical error: rating individuals similarly on attributes considered to be logically related
• Proximity error: rate attributes that seem to be close to each other
• Contrast error: exaggeration between the rater and ratees

How can one increase the reliability of rating scales? (p.162)
Measurement instruments

- Unobtrusive measurement
- Survey questionnaires
- Standardised tests
- Attitude scales
- Rating scales
- Structured interviews
- Individual apparatus (puzzles, complete tasks)
- Direct observation
Unobtrusive measurement

(participants unaware that measurement is taking place)

- Physical traces [measures of erosion (wear & tear of materials) or accretion formation of deposits on materials]
  Personal documents & mass media material [content analysis (see section 9.2.2 later)]
- Official statistics & archival sources (trend analyses)
Survey questionnaire and Standardise tests

• Survey questionnaires (biographical info; typical behavior; opinions; attitudes)
• Advanatage: cost & ease of application; anonymity;
• Disadvantage: control over responding; response rate
• Standardised tests: (content; administration & scoring always the same despite who administers the test)
Attitude scale and Rating scales

- Attitude scale: The object is to refer to either a political; economical; social issue or a custom or a group or an individual – using a 1) Summated or Likert scale
- Buses are on time strongly disagree (1) disagree (2) depend (3) agree (4) strongly agree (5) or
- Semantic differential scale:
  - Good
  - Bad

- Rating scales and situational tests: The rater assesses the behaviour of participants by means of (1) numerical – the use of numbers 1,2 3,4,5,6,7) (2) graphical -horizontal line. (3) behaviour anchored concrete example of behaviour

- Poor

1 2 3 4 5 6 7

Good
DATA COLLECTION METHODS AND MEASURING INSTRUMENTS IN QUALITATIVE RESEARCH
Interviews

- Structured
- Unstructured
- Semi-structured
Conducting structured/semi-structured interviews

• Preparing for interview: #analyse problem #understand information #identify sources of information

• Pre-interview: #schedule time #dress in same way #be neutral #do not engender any resistance against interviewer #beware of being an “intruder” #equipment should be checked beforehand #interview should be rehearsed
Conducting structured/semi-structured interviews

- Interview: #introduce the study & its purpose to orient # use simple, but acceptable language # leave it to informant to provide answers # questions should not lead them to obvious answers # manage time # sensitive topics should be handled with care # get answers within the specified time
Conducting structured and semi-structured interviews

• Post-interview:
  • write down important points
  • in case of recording, write down everything in detail
  • thank informant
  • check whether all forms have been completed
Individual measurements and tests

- Administrator presents subject with tasks
- These are then executed (like in a puzzle)
- Administrator assigns marks
- Stop-watch to control time
- All instructions always given in the same way
- Marks given in the same way
- No deviation between tests allowed
Direct observation

• Contexts:
  use of work sites
  workplace behaviour
  consumer testing
  complementary research
  social behaviour
Elements of observational research

- Choose site
- Choose observation point
- Choose study time period
- Decide: continuous observation or sampling
- Decide: number and length of sampling periods
- Decide: what to observe
- Divide into zones
- Design a recording sheet
- Conduct study
- Analyses data
Observational sampling

- Continuous observation – only samples of the particular behaviour is recorded
- Point in time sampling: at specific time intervals specified data is recorded
- Interval time sampling: observes at specific time intervals for specified data
- Event sampling: for behaviour which is event specific

Advantages:
- First-hand info
- No issues of misleading informants

Disadvantages:
- Presence of observer (suspicion)
- Observer’s prejudices...
Personal visits and Telephone

• Personal visits (opinion polls; interview method; Advantage and Disadvantages: cost and ease of application; time; control over responding; anonymity; response rate)

• Telephonic interview: Interview schedule; cost and ease of application; control over responding; anonymity; response rate
Developing measurement instruments

• Choose judiciously between open-ended and close-ended questions
• Take respondent’s literacy level into consideration
• Be careful not to offend
• Be brief and focused
• Maintain neutrality
• Use a justified sequence
• Be sure the question is appreciable to all respondents
• Lay-out is important
VALIDITY AND RELIABILITY
Validity (*construct validity of dependent variable*)

The measuring instrument should measure what is supposed to measure.

Any measuring instrument measures 3 components:

- The construct
- Irrelevant constructs
- Random measurement error (*reliability*): if measurement outcomes depend on the time it took place or the rater who was recording
Validity and reliability

**Internal validity:**

Internal validity is the degree to which the changes in the dependent variable are due to the influence of independent variables (and not something else)

**External validity:**

Population validity:
- The degree to which findings obtained for a sample may be generalised to the total population

Ecological validity:
- The degree to which results may be generalised to all circumstances that are implied by the research hypothesis
Construct validity  (*instrument should measure that which is supposed to be measured*)

- A variety of variables could collectively make up a “construct”
- These variables should measure the construct when collectively being “assessed” are referred to as construct validity (*social economic status*)
- Triangulation principle (*determine correct position*)
- Convergent validity (*high correlations with other measures of same construct*)
- Discriminant validity (*low correlations with measures of different constructs*)
Criterion-related validity

- Refer to the degree to which diagnostic and selection of measurement or test correctly predict the relevant criterion
- Relevant criterion – the variable that is to be diagnosed or on which success is to be predicted
- Concurrent validity (whether the criterion is present at the time of testing)
- Predictive validity (whether the criterion only become available some time after the test is completed)
Reliability

Concerned with issues that relates to credibility of findings

• Generalisation – reliability of the scores obtained \((\text{consistency of the scores obtained})\)

• Estimating reliability – replication

3 irrelevant sources of systematic variation:

• Measurement occasion; -form; -user
Issues of Reliability and validity

• Inter-rater reliability (having more than one rater and correlate the ratings)
• Test-Retest reliability (administer twice and find correlation coefficient)
• Parallel form reliability (use interchangeable forms of measurement)
• Split half reliability (correlate half of the score of the test with another)
• Subject error (choosing respondents who are already assigned to something to carry a task of another respondent)
• Time error (time observation is conducted)
• Observer effect (observed change behaviour after noting being observed)
• Minimal interaction (observer having little interaction)
• Habituation (observed become familiar with the process)
Pilot studies

- To detect possible flaws in the measurement procedures
- To identify unclear or unambiguously formulated items
- To take note of non-verbal behaviour
Validity and reliability in qualitative research

- **Trustworthiness** is associated to:
  - Truth and value of the data
  - Reality and ideas of participants
  - Delve experience of the participants

- **Credibility** is associated to:
  - Confidence on the data
  - Reflects perception and reality of the participants
  - Affirm the validity and reliability of the data

- **Confirmability** is associated to:
  - Neutrality and objectivity of the data
  - Research and not researcher’s opinion or judgement
  - Data is dependable and can be traced

- **Accountability** is associated to:
  - Being responsible for the facts expressed by the data
  - Answerable
  - Make general conclusion from statements
WRITING RESEARCH REPORT
Writing research reports

• What is research problem?
• How was problem investigated?
• Thesis/dissertation/article/work-related
• Principles of public scrutiny
• Replicability
Sections of research report

• Introduction
• Theoretical background & hypotheses
• Procedures & methods
• Results obtained
• Interpretation & discussion of results
Title

• Topic
• Important variables
• Population (where/what)
Abstract

• What was research problem?
• How was problem investigated?
• What has been found?
• What are the implications?
The introduction

• Begins with a wide general description of the problem
• Progresses to formulation of specific problems
• Formulation of hypotheses
The literature review

• Sometimes in one, but also in more than one chapter
• Highlights most pertinent findings as discussed by other researchers
• Compare/contrast
• Differences/similarities
• Relevant theories presented
Problem statement & hypotheses

- Formulate problem statement/s
- Formulate hypotheses
Methodology

• Relates to *control* & *replication*
• Units of analysis
• Research design: experimental and/or data-collection
• Apparatus: measuring instruments
Units of analysis

• The way these were obtained
• From which population
• How many were involved (numbers)
• Sample: describe in terms of biographical/demographical socio-economical.....
• Which sector (or industry...?)
The results

• Present statistical results
• Tables & graphs
• Statistical significance (see p 252)
• Presenting the results – the rules (p252-253): letter symbols/numbers/capital letters
Discussions & conclusions

• Summary of main findings to start with
• Practical implications
• Statistical significance (or not)
• Restrictions on validity & reliability
• Shortcomings in study
• Further research suggested
References & Appendices

• List of sources used in text only for references
• Appendices: questionnaires or statistical results
Conventions, grammar, style

• Headings & titles
• Person, voice, tense
• Abbreviations
• Gender
• Grammar & style: accurate; clear and concise; logical flow throughout text; adjectives & adverbs
THE END
Thank You.