COURSE GUIDE

POL 715
RESEARCH METHODOLOGY AND STATISTICAL PROCESS

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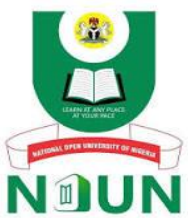

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Introduction

Human beings have innate ability to make enquiry about things around them. They are inquisitive to learn. The art of making effort to know what was not known before or widen the frontier of knowledge in a systematic manner is called research. Many people search for knowledge, but not everybody search for it in an organized or systematic way. This course, Research Methods and Statistical Process therefore, is meant to teach students how to search for knowledge in a systematic manner. Some of the information collected during the search for knowledge at times could better be understood if presented and analysed in form of figures. This is called statistics. Hence, this course also teaches the process of presenting and analysing information gotten through research in forms of numbers. Thus, this study exposes students to research in the social sciences.

This course module is divided into two sections. The first section is on research methods, while the second section is on statistical process. The first section starts with the two methods of acquiring knowledge, non-scientific and the scientific methods. The next section focuses on the meaning of research, types of research, research process, basic concepts in research, literature review, data presentation, analysis and results, references and the components of a good research project.

Political Science as a course has developed from one phase to another. The methods of analysis then used to be philosophical, historical, institutional and legal framework (constitution). However, the advent of behaviouralism led to scientific orientation in political studies, which at times necessitate the use of statistics. Thus, the second section focuses on statistical studies.

What you will learn in this course

As you go through this course, you will discover that the fear that is generally associated with research methodology and statistical process is unfounded. Students more often than not do entertain unnecessary fear that the course is difficult, especially the statistical aspect. Quite a number of students studying Political Science have phobia for any course that is mathematical or statistically inclined. This phobia will be removed as you will soon learn that statistics is merely a tool for research, to interpret the research results or findings.

The Course Aim

The aims of this course are in four-fold, namely: (a) to enable students have a general overview of scientific investigation of political

phenomena, i.e., how relevant data are gathered and analysed in political research; (b) equip students with practical skills of carrying out research; (c) expose students to how to write academic research project and lastly (d) to equip students with statistical knowledge relevant to political science research.

The Course Objectives

- To explain the research process and methods of acquiring knowledge (non-scientific and scientific methods)
- To identify the significance of research and challenges of research in Political Science;
- To acquaint students with the basic concepts in research (variables, hypothesis, research design etc.);
- To expose students to the types of research (quantitative and qualitative);
- To acquaint students with how to writes a good research proposal;
- To intimate students with the necessary ethics that should be taken into consideration while conducting academic research;
- To familiarize students with how literature review is executed;
- To expose students with methods of gathering data for research and analyse them;
- To acquaint students with the various methods of referencing;
- To intimate students on how to construct a good questionnaire and use them in survey;
- Identify the attributes of a good questionnaire;
- Know the features of documentary research, interview and Focus Group Discussion among others.

Working through This Course

In order to complete this course, it is important you read the study units and other materials the National Open University of Nigeria has provided (NOUN). Each of the unit has a segment on self-assessment exercises and there will be a time you will be required to do some assignments which will be assessed as part of your total score for the course. At the end of the course, there will be a final examination. It will take you between 15-17 weeks to complete this course. The components of the course (the topics you will go through) are listed below, hence, it is now your responsibility to make sure you allocate time proportionately so as to cover all the units of the course successfully within the record time.

Course Material

Major Components of the course are:

- Course Guide
- Study Units
- References
- Assignment
- Presentation Schedule

Course Units

The study units of this course are:

Module 1 Introductory Issues

Unit 1 Sources of Knowledge
Unit 2 The Meaning of Research and the Research Process
Unit 3 Purposes of Political Science Research

Module 2 Basic Concepts in Research, Literature Review and Citation

Unit 1 Basic Concepts in Research
Unit 2 Literature Review Skill in Conducting Research
Unit 3 Citation Skills in Conducting Research

Module 3 Typologies of Research, Chapter Outline and Research Ethics

Unit 1 Typologies of Research
Unit 2 Chapter Outline
Unit 3 Research Ethics

Module 4 Methods of Data Collection

Unit 1 The Questionnaire Instrument
Units 2 Interview Instrument and Focus Group Discussion (FGD)
Unit 3 Observation and Documentary Methods of Data Collection
Unit 4 Issues of Validity and Reliability in Research

Module 5 Statistics in Political Science Research

Unit 1 Basic Concepts in Statistics
Units 2 Measure of Central Tendency

Unit 3 Correlation
Unit 4 Measure of Dispersion

Assessment Files

There are several assignments in this course material and the assignments cover all the topics. The essence of these is to aid our understanding of the course.

Presentation Schedule

As determined by National Open University of Nigeria (NOUN)

Assessment

The part that has to do with assessment is in two parts, the first one is the self-assessment test and the other, the written examination. Your assessment is 30% of your total course mark. You will sit for exam at the end of the course which is 70% of the total course mark. This assessment process is in line with the prescribed minimum benchmark of the National Universities Commission (NUC).

Course Marking Scheme

Total course marking scheme are as presented below:

Assignment	**Mark**
Assignment 1-9	Six of the assignments where a student has the best scores at 5% each = 30% will be used
Final Examination	70% of overall course marks
Total	100% of course marks

Course Overview

Module 1: Introductory issues

Unit	**Title of work**	**Week Activity**	**Assignment (end of unit)**
	COURSE GUIDE		
1	Sources of Knowledge	1	
2	Definition of Research and Research Process	1	Assignment 1
3	Purposes of Political Science Research	1	Assignment 2

Module 2: Basic Concepts, Literature Review and Citation

Unit	Title of work	Week Activity	Assignment (end of unit)
	COURSE GUIDE		
1	Basic Concepts in Research	2	Assignment 1
2	Literature Review	1	
3	Citation Skills in Research	1	Assignment 1

Module 3: Typologies of Research, Chapter Outline and Research Ethics

Unit	Title of work	Week Activity	Assignment (end of unit)
	COURSE GUIDE		
1	Typologies of Research	1	Assignment 1
2	Research Report Chapter Outline	1	
3	Ethical Issues in Research	1	Assignment 1

Module 4: Methods of Data Collection

Unit	Title of work	Week Activity	Assignment (end of unit)
	COURSE GUIDE		
1	The questionnaire Instrument	1	Assignment 1
2	Interview Instrument and Focus Group Discussion (FGD)	1	
3	Observation and Documentary Method of Data Collection	1	Assignment 1
4	Issues of Validity and Reliability in Research	1	

Module 5: Statistics in Political Science Research

Unit	Title of work	Week Activity	Assignment (end of unit)
	COURSE GUIDE		
1	Basic Concepts in Statistics	1	Assignment 1
2	Measure of Central Tendency	1	
3	Correlation	1	Assignment 1
4	Measure of Dispersion	1	

MAIN COURSE

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MODULE 1 INTRODUCTORY ISSUES

The introduction which is concerned with the epistemological issues (sources of knowledge) provides a strong foundation for many other issues that will be discussed in this course. In this introductory part, unit one focuses on the non-scientific and scientific sources of acquiring and validating knowledge. Unit two takes a look at the meaning of research and research process. Lastly, unit 3 examined the purposes of political science research.

Contents
This module consists of three units as presented below:

Unit 1 Sources of Knowledge

Unit Structure

1.1 Introduction

Research means the search for knowledge. There are various methods of gaining knowledge, same way people seek knowledge for different reasons. People seek for knowledge with a view to improving their lives, environments and ways of doing things. This unit focuses on the methods of gaining knowledge before and after the scientific revolution.
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1.2 Objectives

At the end of this unit, student should be able to:

- Identify the major sources of knowledge.
- Explain the characteristics of both the scientific and non-scientific methods of research.

1.3 Sources of Knowledge

People gain knowledge in many ways as they struggle daily to meet their needs. Scholars like Nnanolue, Ezeibe, Aniche, and Iwuoha (2018) , Agbaje and Alarape (2010), Obasi (1999), Osuala (1993) have discussed some of these sources of knowledge that we have mentioned before under the introduction above (the non-scientific methods and the scientific method of gaining or validating knowledge). Out of the various sources of knowledge, only the scientific method is dependable.

1.3.1 Non-Scientific Methods

By non-scientific methods, we refer to all those methods deployed in seeking or acquiring knowledge which do not follow any logical step or process. In other words, non-scientific methods involve techniques that rely on unstandardized instrumentalizations to expand our understanding.

The non-scientific methods of acquiring knowledge include the following:

Common Sense:

This refers to knowledge obtained through opinions that are widely held based on traditions and everyday experiences. Thus, common sense includes knowledge, awareness or practical judgment which is derived from experience rather than organized study. Common sense does not depend on special education or training, rather it is an attribute of human kind which essentially fed by people's hearsays and blind appeal to authority. Common sense originates from, and is reflective of, social traditions, conventions and processes. Although common sense knowledge may be accurate and offer credible insight is anchored on commonly held beliefs and assumption as well as limited personal experiences rather than systematic analysis of fact. The result is that common sense may be opposed to informed judgment. Many things that at first seem obvious to common sense become less and less obvious the closer you look at them.

Intuition

This describes instinctive knowing; that is, mental apprehension without the use of rational process. Intuition means the acquisition of knowledge or insight from an unknown inner source. In other words, to intuit is to obtain knowledge by means of our power to create mental representation. Knowledge is obtained through insight into an issue without consciously thinking of it or being aided by logical reasoning.

Faith or revelation

Faith as a means of knowing is to completely have trust or confidence in someone or something or more explicitly, to accept something as true because we believe that its source is supernatural. It is an unquestionable acceptance of seemingly impossible things as true based on factors outside the realms of evidence. Heb. 11:1 aptly captures the core essence of faith when it affirms that it is the substance of things hope the evidence of things not seen. Some scholars believe that faith occupies a primary position in the structure of knowledge acquisition and therefore must be categorized above all other forms of knowing. Related to faith, **Revelation** is the natural or supernatural disclosure or communication of knowledge to humans through means that are beyond the ordinary course of nature. Essentially, revelation knowledge is transmitted by a superior to lesser beings. Faith and revelation constitute the major means of knowing among the world's religions. From religious perspective, revelation is all about God disclosing Himself and His will to humanity. The process of disclosure implies a tripartite media: the communicator, who is God; the receiver, who is the human; and a transmitter or intermediary- who may be a prophet, seer, diviner or specially anointed person. While faith entails a total surrendering of oneself to certain beliefs based on unshakeable convictions about the authenticity of our expectations, revelation is based on the disclosure of divine or supernatural truths by God or put more succinctly, God speaking directly or indirectly to mankind.

Experience

This connotes the cumulative body of knowledge, skills, or techniques that results from direct or indirect participation or involvement in events or activities. The encounters we have in daily lives including the deliberately designed ones and the accidental ones which in totality become the conditions we pass through in life, constitute an experience. However, experience may not be able to provide the complete picture due to the limitations of individual experiences. There are also situations where one may be required to know things that may not be learnt or experienced.

Tradition

Which from its Latin origin literally means "something handed over", denotes specific sets of practices that have long standing antecedents which a set of people have taken as their way of life. It can be viewed as an inherited patterns of thought or action handed over from generation to generation. Knowledge generated through tradition is often passed from generation to generation through cultural mechanisms such as family, folklores and other media, and religious institutions. Tradition as a

means of knowing has contributed immensely to the advancement of knowledge generally. In some instance, traditional knowledge systems have provided important insights and set the tone for further enquiry into diverse areas.

Testimony

Testimony is another non-scientific agency of seeking knowledge. Testimony simply describes the reliance on the experiences of others as the basis of knowing. Generally, testimony is all about oral or written assertions that attempt to illuminate or offer greater insights into an issue or sets of issues. Testimony derives its essence from the opinions or inferences of the testifier. Testimony sources are accepted as reliable when listeners or hearers attribute credibility to them, especially in the absence of special contrary reasons.

Authority

This implies an expert who possesses specialized knowledge in a given area of knowledge. The expert transmits his/her view or opinion to others and such views or opinions are taken as definite in the particular knowledge area concerned. In other words, the opinion which the expert furnishes is regarded as valid because of the esteem in which he or she is held. Some scholars also believe that the Holy Books; the Holy Bible and the Holy Quran also fall under authority as the adherent of them believe the knowledge there is authoritative and cannot be questioned.

Reason or Rationalism

Reason or rationalism extends knowledge beyond things we already know by utilizing the tool of logical reasoning. Logical reasoning enables us to derive previously unknown truths, from available facts. The interconnectedness of the truth to available facts establishes the creditability of the truth. It is a process of using local analysis to arrive at a conclusion. The acceptance or rejection of a conclusion is dependent on the logical interconnections preceding it.

Media Myth

The media in general foist a particular way of looking at something repeatedly that every one would believe it to be true. This may be far from the reality. But whatever is the case, many people acquire knowledge from what is called ‘myths of a culture’ or ‘media hype’. For example, the media according to him can create a feeling that a problem exists when it may not. The media informs as much as it misinforms

hence its role as a source of knowledge is usually subjected to further scrutiny from other more credible or higher sources of knowledge.
These are some of the methods of acquiring or validating knowledge that are non-scientific. In fact, some of them predate the scientific method and in fact, the scientific method grew out of a felt need to addresses perceived weaknesses associated with the non-scientific methods. Some of the weaknesses according to Agbaje and Alarape (2010) are as follows:

Identifying and resolving conflict among contending perspectives or positions under any of the non-scientific methods is difficult if not impossible. For example, if we say A believes in God because he believes in God and B does not believe in God because he does not believe in God, the problem is how do we assess which position is superior or better?

In view of the problem highlighted above, is the fact that the non-scientific methods of acquiring or validating knowledge do not facilitate progress.

Another problem inherent in the non-scientific methods of acquiring or validating knowledge has to do with the fact that such knowledge is time-bound and space-specific. That is, such knowledge do not have universal applicability.
In his analysis of the transition from the non-scientific methods to scientific knowledge acquisition, a philosopher of science in the early 20th century, Charles Peirce cited in Agbaje and Alarape (2010: 6) has this to say:

To satisfy our doubts …, it is necessary that a method be found by which our beliefs may be determined by nothing human, but by some external permanency – by something upon which our thinking has no effect. The method must be such that the ultimate conclusion of every man shall be the same. Such is the method of science. Its fundamental hypothesis is this - there are real things, whose characters are entirely independent of our opinions about them.

1.3.2 The Scientific Method

Scientific method of acquiring knowledge is an empirical method of investigation based on the laid down procedures for collecting, analyzing and evaluating information. What differentiates the scientific method from the non-scientific methods among others is the fact that the scientific method involves the application of the rule of science in it search for knowledge.

Characteristics of the Scientific Method

- In science, knowledge is produced or validated through recourse to standards and procedures that are largely external to the individual. It is more or less permanent and human thinking does not affect this method of knowledge acquisition.

- The scientific method is controlled and systematic in the sense that any investigation that is scientifically inclined must follow a tightly disciplined procedure that is laid.

- This method is critical. It also emphasizes openness in the search for knowledge through insistence that all arguments and procedures be fully reported and made public.

- The scientific method gives room for replication. Since the procedures are explicitly laid out and the process fully disclosed, it makes it possible to repeat a particular study by others across time and space with a view to either corroborate or refute such findings.

- The scientific method is self-correcting. The scientific method is self-correcting in the sense that there is no final solution with this method. Thus, there is no room for oracles or infallibility. In fact, this method is more interested in testing the error or falsehood of the established fact, rather than proving such facts to be true.

- It is empirical as it leads to the collection of evidence and the testing of such evidence. In this sense, the method is more concern with what "is" rather than what "ought to be" in terms of evidence from which it seeks to validate knowledge.

Self-Assessment Exercises

1. What do you understand by the term research?
2. Discuss three non-scientific methods of gaining knowledge
3. Highlight the characteristics of the scientific method

1.3 Summary

It is important for us to understand the various sources of knowledge as well as their strengths and weaknesses which this unit does. Any of these methods or a combination of some of these methods of seeking or validating knowledge is still very much in vogue. However, this unit has demonstrated that when we talk of knowledge that is systematic and

empirically verifiable, it is the scientific method that fulfils such requirements.

1.5 References/Further Reading/Web Resource

Agbaje, A. and Alarape, A. I. (2010) Introductory Lectures on Research Methodology

Nnanolue, B.O, Ezeibe, C.C, Aniche, E. T. and Iwuoha V.C. (2018) (eds). Political Inquiry and Research Methodology: Logic, Designs, Processes, Methods and Approaches, Enugu, Nigeria: Parakletons Creative

Obasi, N. O. (1999). Research in Political Science. Enugu: Academic Publishing Company

Osuola, E.C. (1993) Introduction to Research Methodology New Edition, Onitsha: Africana FEP Publishers Ltd.

1.6 Possible Answers to Self-Assessment Exercises

1. Research is seeking knowledge with a view to establishing the truth or engendering solution to a given phenomenon or puzzle.
2. Tradition, Testimony and Authority.
3. Empiricism, Reliability, Validity and Objectivity.

Unit 2 The Meaning Of Research And Research Process

Unit structure

2.1 Introduction

The discussion on the sources of knowledge provides an insight into the meaning of research. This unit gives the meaning of research as well as the steps involved in carrying out scientific research. One important thing about research is that, it is procedural, i.e. driven by procedure. The explanation on the step-by-step approach will deepen our understanding of research.

2.2 Learning Outcomes

At the end of this study, students should be able to:

- Have a clear understanding of what research connote
- Familiarize themselves with the process involved in research

2.3 Meaning of Research

In a broader sense, research can be defined as a systematic way of gathering data and information in order to find out or advance knowledge in any field. Research can as well be seen as a practical way of answering intellectual question through systematic methods. At this juncture, some definitions will be considered.

According to Osuala (1993) research can be defined as activities designed to discover facts and relationships that will make knowledge more effective. Bodla (nd) sees research as the process of finding solutions to a problem after a thorough study and analysis of the situational factors. Research in a lay man language simply means a search for knowledge. It can also be defined as a scientific and systematic search for pertinent information on a specific topic. It is therefore not a surprise that Singh (2006) opine the word research can be split into it natural lobes, “Re” and “Search”. “Re” means again and again, while “Search” means to find out something; so the process is a person observes phenomenon again and again, collect data, analyse it

and conclude. This position lend credence to the definition of Kothari (2004: 1) that research is an art of scientific investigation. It is "a careful investigation or inquiry especially through search for new facts in any branch of knowledge.". Redman and Mory (1923:10) define research as a "systematized effort to gain new knowledge."

Some people consider research as a movement from the known to the unknown. It is actually a voyage of discovery. We all possess the vital instinct of inquisitiveness for when the unknown confronts us, we wonder and our inquisitiveness makes us probe and attain full understanding.

2.3.1 Research Process

Research process is the way through which the stated goals of a scientific research can be realized. Yacob-Haliso (2016) stated that, the process is a never ending one in view of the fact that, the end of one researcher's activities could be the starting point for another researcher. The reason for this may be connected with the fact that, the end of one research effort may trigger new problems of study, or new hypotheses for investigation.

The steps involved in the research process are: identification of a research problem, review of relevant literature, formulation or construction of hypotheses, research design, collection of data, analysis of data, generalization and report writing.

1. Identification of research problem
2. Extensive literature review
3. Developing the hypothesis
4. Preparing the research design
5. Determining sample design
6. Collection of data
7. Analysis of data
8. Generalization
9. Writing the report

1. Identification of a research problem

The beginning of a scientific enquiry is the identification of a research problem, which is a question or issue requiring a response in the form of a structured scientific inquiry (Frankfort-Nachmias, 2015). As social scientists, our observation of the social world or existing research can trigger us to seek for answer to some problems discovered through a laid down process (scientific research). As political scientists, there are so many issues around us that beg for investigation. For instance, how do

Nigerians perceive the anti-corruption crusade of government? Why are educated Nigerians passive politically? Why is the problem of insecurity becoming a hydra-headed monster defying all forms of solution? These kinds of questions are the beginning of framing a research problem which should be subjected to other processes before it can be investigated successfully. It is important to state that; research problem should be stated clearly without any form of ambiguity. It is necessary to state is in a specific manner so as to produce findings that will be usable and can be generalized. The problem must be amenable to empirical investigation, and answerable via appeal to evidence (Vadum and Rankin, 1997).

2. Review of Relevant Literature

Once a research problem is extracted from the array of possible social issues for research, the next thing for the researcher is to do a review of related literature in line with the problem identified. The importance of this is predicated on the fact that, it assists the researcher to know more about the issue, gather relevant information to state the problem more pungently and also confirm that earlier studies have not resolve the proposed research problem. This will help the research to avoid duplication of what had already been done, which is tantamount to waste of effort. The justification for the study should be to close the specific knowledge gap in the literature.

3. Hypothesis Construction

Hypothesis may be derived from theory or from the result of earlier research and can be refined in a better way as the research progresses. Hypothesis is a tentative and testable statement dealing with the relationship that exists between empirical variables in a research. It is s tentative answer to the research question. Hypothesis must be empirically testable and must be value free.

4. Research Design

This is the strategy for executing research on identified problem for study. It is comprehensive in nature as it reveals what variables to be observed, how they are to be measured as well as the method. It helps to refine hypotheses, it guides in data collection, analysis, interpretation of results. It enhances the understanding of the purpose of research that is whether is descriptive, exploratory or explanatory.

5. Data Collection

Data are needed for any research to be successfully carried out. It is also necessary to validate the instruments for data collection. Pilot study can be conducted on the instrument. Reliability test can also be carried out on the instruments. Examples of instruments for data collection are: interview, questionnaire, focus group discussion, observation among others.

6. Data Analysis

Data collected from fieldwork must be processed and organized into meaningful categories otherwise, it has no meaning. The analysis of a given research is a function of the research questions, hypotheses formulated and whether the research is qualitative or quantitative. It is easy to draw conclusion after the data have been organized and summarized.

7. Generalization

Generalization is the application of the findings of the study to broader reality. If the application yields appreciable results in larger space over time, it becomes a theory. It is necessary to state however that, generalization is often conditioned or limited by the type of research design engaged and the methods of data collection.

8. Writing the Report

The starting point of a research is when the problem is identified through thinking which will be followed by planning, execution, analysis and finally the report writing. Writing the report will contain the following sections; the title of the research work, abstract, introduction, literature review, method, result, discussion of result, references and appendices.

Self- Assessment Exercise

1. What is a hypothesis?
2. What does the research design entail?
3. Explain the concept of generalization.

2.4 Summary

The unit discusses two related topics (a) the meaning of research (b) the research process. As discuss before, research is simply a means of gaining knowledge and from the perspective of science, it is the

application of scientific procedure(s) in solving problem. The steps are: identification of problem, review of relevant literature, construction of hypothesis, research design, and collection of data, data analysis, generalization and writing of the complete report.

2.5 References/Further Reading/Web Resources

Frankfort-Nachmias, C, and Nachmias, D and DeWaard, J. (2015) Research Methods in the Social Sciences 8th edn. New York: Worth Publishers.

Yacob-Haliso, O. (2016) "Introduction to Research" in Okolie Aloysius-Michaels and Ajene Oga Godwin (eds) Research Methodology in Social Science Analysis. Nigerian Political Science Association.

Vadum, A.C. and Rankin, N. O. (1997) Psychological Research: Methods for Discovery and Validation. Boston: McGraw Hill.

2.6 Possible Answers to Self-Assessment Exercises

1. Hypothesis is a tentative answer to a research question.
2. Research design is the investigator's overall strategy for finding solutions to the research questions. This entails the population and sample of the study, the data type, sources and analytical method, among others.
3. Generalization is the application of the findings of the study to broader reality.

UNIT 3 Purposes of Political Science Research

Unit structure

3.1 Introduction

Every discipline conducts research, and, for various reasons. Research can be basic or applied. Basic research is conducted with the goal of increasing the general store of knowledge while applied research is to proffer practical solutions to problem. Finding answers to what happened? why it happened? put the researcher in a vantage point to say whether it will happen again. This unit provides reasons for embarking on research in Political Science.

3.2 Learning Outcomes

At the end of the unit, the student will be able to:

- to identify reasons for research in Political Science
- differentiate between basic and applied research

3.3 Research Purpose

Research is conducted for many reasons. Fundamentally, research could be conducted either as basic/pure or applied. Basic/pure or theoretical research is conducted so as to increase the general storehouse of knowledge. In the main, basic research deals with the development of theories about what political phenomena are and why events happen the way they do. For example, basic research is the study of the fossils of life forms that existed millions of years ago on the earth. This science of paleontology is characterized by an emphasis on theory building rather than on the application of solutions to a real-life problem. In this sense, building a theory in paleontology might be concerned with why the dinosaurs disappeared. However, findings of this nature on paleontologists are interesting indeed to many people in the world of politics has little immediate, practical value.

On the other hand, applied research, is conducted to provide solutions to practical problems or to assist political scientists and other researchers to understand past behavior with a view of guiding them in their attempts at predicting future behavior. In this circumstance, researchers who embarked on applied research are concerned with developing theories about why something happened; they look for causal relationships. The essence of research therefore, is to describe in detail what happened, how it happened, and why; in this manner, researchers hope they have the ability to predict its happening again in the future. Singh (2006) avers that both basic and applied research in Political Science use the same methodologies, similar research designs, and skew their research tasks with scientific rigor, ethics, validity, and reliability.

Researches in Political Science, according to Babbie, are usually founded on the following objectives:

(1) The exploration of a topic;
(2) The description of a topic, situation, or event; or
(3) To explain some phenomenon.

However, Pennings, Keman, and Kleinnijenhuis (1999) in their study of comparative method in political science research, highlighted three purposes for political science research, which are to identify:

(1) Regularities in the relationship between political actors and society,
(2) Institutionalization process of political life, and
(3) The changes in society that emerge from the first two forces.

Similarly, Stallings and Ferris (1988) classify the purposes for conducting research in political science into three; christening the different purposes conceptual, relationship, and evaluative. In their view, the importance of conceptual study is to establish the basic concepts that are germane to a problem. Conceptual studies are designed in such a manner as to highlight those variables that are fundamental for further research or to frame a problem that can lead to the development of another study. Hence, the purpose of a relationship study is to describe relationships between variables or to find out the underlining cause of such a relationship. Finally, evaluative studies are designed for the purpose of explanation or evaluation of an event, policy, a program, or some other phenomenon. Another scholar that had looked at the purposes for research in political science from another perspective is Lathrop (1969). He has a different approach. To him, research has four main purposes.

They are:

(1) Testing of theory
(2) Extending the existing research range of applicability,
(3) Resolving findings of research that are conflicting and
(4) Replicating previous studies.

Reasons for research can as well be understood by taking a look at the research objectives. Research objectives and research purposes in the field of science are intertwined. For example, three often-stated objectives for research are:

(1) to explore a topic with the aim of gaining insights and ideas,
(2) to describe a topic, which may involve counting the number of times one or more phenomena occurred, or
(3) to establish and/or measure causation; in a causal study, the purpose is to determine the power of one or more independent variables to influence change in a dependent variable.

Self-Assignment Exercises

- Identify reasons for research in Political Science as enunciated by Babbie
- Discuss the purpose of Political Science research from the perspectives of Pennings, Keman, and Kleinnijenhuis.
- Examine Lathrop four objectives of research

3.4 Summary

This unit advanced different reasons why research is undertaken in political science. It showed that the purposes are as diverse as the researchers, and that partly accounts for the dynamism we see in the field in terms of the multi-faceted approaches to explaining and analysing political issues.

3.5 References/Further Reading/Web Resource

Babbie, Earl. 2001. The Practice of Social Research. 9th ed. Belmont, CA: Wadsworth/Thompson Learning.

Lathrop, Richard G. 1969. Introduction to Psychological Research. New York: Harper & Row.

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3.6. Possible Answers to Self-Assignment Exercises

1. The exploration of a topic; The description of a topic, situation, or event; or To explain some phenomenon.
2. To identify**:** Regularities in the relationship between political actors and society; Institutionalization process of political life; and, the changes in society that emerge from the first two forces.
3. (1) Testing of theory (2) Extending the existing research range of applicability, (3) Resolving findings of research that are conflicting and (4) Replicating previous studies.

MODULE 2 BASIC CONCEPTS IN RESEARCH, LITERATURE REVIEW AND CITATION

Unit 1 Basic Concepts in Research

Unit structure

1.1. Introduction

Every discipline has some terminologies that are very peculiar to such discipline. Research as a field of study also has some terminologies. In this unit, we shall be looking at some of the basic terminologies of research.

1.2 Learning Objectives

At the end of this unit, student should be able to:

- Discuss some of the basic concepts in research.
- Identify the roles of those concepts in research.

1.3 Basic Concepts/Language of Scientific Research and their Explanations

The science or study of methods of research, otherwise called research methodology, has its own language and key words. It is appropriate at this stage to briefly highlight the meaning of words that we will continue to encounter as we study and apply the scientific method. These include population (or universe), sample, subject, parameter, statistic, concept, variable, hypothesis and theory.

Population

Population is also known as universe, which consists of all these units/elements with specified characteristics the researcher is seeking. The unit is the smallest single element, which possesses the specified characteristics, which can be individual, group, class, social categories, state, etc. Thus, population refers to any group of people with one or more characteristics in common which distinguishes that group from other individuals. A complete population comprises all the elements in the target population. It is an aggregation of all elements that share common characteristics. Suffice to say that population can be classified into:

(a.) Target population- these are the members of a specified group to which investigation relates and

(b) Accessible population-this is defined in terms of those elements in the group within the reach of the researcher. We also have

(c) Finite and infinite population. Finite population- has definite number that is countable. In other words, it contains a countable number of sampling units.

(d) Infinite population- has indefinite number of elements that cannot be counted or determined. Put differently, an infinite population consists of an endless or unlimited number of sampling units.

2. Sample

Sample is a segment of the population selected or chosen to represent the population as a whole. Therefore, a sample refers to any sub-set or sub-group of the population. Put differently, a sample is a partial universe or a sub-set of the universe selected in such a manner that we can generalize about the entire universe by examining only some of its units. It is a part of the population or universe. A sample is a portion of the population or a smaller group of elements drawn through a definite procedure from a specified population. It is a small proportion of the population that is selected for observation and analysis.

The purpose of sample or reasons for sampling may include:

i. To reduce time :- sampling reduces the time the researcher would have spent working on the entire population.
ii. Save cost:- sampling reduces the amount of money that would have been spent if the entire population were to be studied.
iii. To generate data:- sampling helps to generate data that are accurate and representative of the entire population.
iv. To obtain detailed, in-depth and sufficient/adequate knowledge of the entire population.
v. Greater speed:- data can be collected and summarized more quickly for a sample than the entire population.

There are two broad division of sampling.
Probability Sampling
Non-Probability Sampling.

Probability Sampling

A probability sampling is a sampling method in which every member of the population has a known assurance of being included in the sample to be studied. Examples of probability sampling methods are:

simple random sampling, systematic sampling, stratified sampling and clustered sampling.

Non-Probability Sampling

This is the opposite of the probability sampling technique. It is necessarily so, in the sense that, the likelihood or assurance of every member of a target population to be included in the sample is not known. It has the major advantage of convenience and economy.
Examples of non-probability sampling technique include; quota sampling, purposive or judgmental sampling, snowball sampling and accidental sampling.

Simple Random Sampling

Simple random sampling is that method of drawing a portion of a population or universe so that each member of the population or universe has equal chance of being selected. By way of extrapolation, a sample drawn through this method is unbiased based on the fact that no member or element of the population has any more chance of being selected than any other member. It means the selection of a member or an element does not affect the chances of another person or element being included. The disadvantage of this method is predicated on the

fact that, some specific characteristics of the population such as proportion of certain group (e.g. male, old, young, black, white, etc.) might miss the chance of entering the sample. It is prone to larger sampling error than the stratified sampling technique.

Systematic Sampling

This is a more careful method of sampling. It involves, selecting sampling intervals systematically, in such an order of magnitude, in a manner that every nth unit or element is selected into the sample from homogenous and fairly small target population. The first sample is selected by a random method; the other members are automatically and systematically selected. The population is arranged in a sequence in order of magnitude, and then, randomly select a starting point. Secondly, select every nth based on the sampling interval already randomly determined.

Let us assumed the interval is taking as tenth and the starting point is the fifth item, it implies that the next number will be fifteen. The important thing is that the choice is systematic or sequential.

Stratified Sampling Techniques

When a researcher is aware of certain composite characteristics of a target population, and has the feeling that, such characteristics are likely not to be adequately taken care of by a chance factor, it becomes necessary to adopt stratified sampling technique. Thus, the conditions that may necessitate the adoption of a stratified sampling technique include. Awareness of different features of a target population; the conviction that it is through stratified sampling technique that such features could be adequately represented and the need to capture the different strata before generalization that is reliable can be made. The greatest advantage of stratified sampling technique is high degree of representation of the composite population characteristics.

Cluster Sampling Technique

This technique necessitates selecting members of a sampling in groups rather than individually. Members of the population under study are grouped on the basis of e.g. occupation, religion among others. A random sampling technique is then used to select from the identified clusters. Emphasis in this type of research is the group and not individuals who make up the group. This particular technique is very suitable when the target population is too large and may be difficult to handle based on the time and resources required.

Quota Sampling

This involves the selection of elements that have required characteristics to fill a quota. The term quota predetermined number of what is desired. For instance, a study that is gender sensitive might insist on including a certain number of women and certain number of men. This is not the same thing with stratified as it lacks randomness which is a feature of probability sampling technique.

Purposive or Judgmental Sampling

In this type of sampling, researcher may target some sub-groups or individuals that exhibit some characteristics, which now qualifies the group or individual to be sampled. It simply connotes, handpicking samples from groups or individuals who are identified as useful indicators. This technique saves time and money but ignores randomness.

Snowball Sampling

This is used to gain access to groups which ordinarily would have been out of reach of the researcher. It is useful in a kind of study in which the researcher needs participants in an area or subgroup that he has little or no contact with. The researcher can use one or two members of the group who perhaps, may be a relations as contacts to gain insight into the group. Or use them as research assistants to distribute questionnaire particularly to their own acquaintances. The strength of this technique is predicated on the fact that, subgroups which ordinarily wouldn't have been reached, can be reached. One of the snags of this technique, however, is that, it is open to bias with attendant consequences if untrained hands are used in the administration of questionnaire.

Accidental Sampling Technique

Accidental sampling is also referred to as convenience sampling in the sense that, the researcher select his or her sampling based on convenience without taking cognizance of how representative is the sampling to the population. It is called accidental because in most cases, sampling is generated from anyone and everyone the researcher encounters in a place or within certain times. Thus, membership of a sampling could be coincidental. This method of sampling is cheap, easy and encourages speed in sampling, but it has the potential of being bias and is limited in usefulness. It is good for trial sampling most times.

A subject is a single member of a sample. Thus, the January 1966 coup in Nigeria is a subject in the sample of African coups that occurred in the 1960s drawn from the population of all military coups in Africa.

A parameter is an attribute of a population. An example would be the success rate of all coups in Africa..

A statistic is an attribute of a sample. An example is the success rate of a sample of military coups in Africa.

1.4 Concept

Concept has been defined in various ways by scholars. According to Isaak (1969), concepts are universal descriptive words, which scientists formulate or develop so as to describe, the range of phenomena that of interest to him. Frolov (1984) conceptualize concepts as link up words that aid the determination of the exact meaning of words with the aim of using them in the process of thought. To Conant (1951 cited in Biereenu-Nnabugwu, 2010)) concepts are abstractions based on characteristics of perceived reality. It is a word or general notion that expresses generalizations from particulars. Anike (1986 cited by Biereenu-Nnabuggwu, 2010:93-94) sees it as "vocabularies with which the scientists talk about the world"

From the preceding paragraph, it is clear that one way of defining a concept is through the use of other concepts. For instance, weight can be defined with reference to word "heaviness". In the same vein, security as a concept can be understood in relation to safety, danger and anxiety. This is what is called conceptual definition – defining a concept (word) with the help of other concepts (words). Another way of defining concepts, especially in certain types of research involving quantitative data, is through what is called operational definition. This definition specifies the process by which a concept is to be measured.

1.5 Operational Definition

Kerlinger (1977) sees operational definition as a way of specifying activities of a researcher in measuring a variable or in manipulating it. For instance, operational definition of weight will specify specific measurement procedure (in pounds, kilogrammes, etc). Security can be operationally defined as zero strikes, zero conflicts, etc within a specified period. Jones (1971:15) explains operational definition by making a distinction between it and concept as well as variable. He said if terms are quite abstract, they are called concepts; and if they are quite specifically related to the real world, they are called operational definitions or indicators. Jones went further to state that every concept contains several variables and for every variable, there are a number of possible operational definitions. In analyzing the relationship between concepts, variable and operational definition, Obasi (1999) gave an example. For instance, motivation is a concept, while the variables for

motivation include salary, training, promotion and physical working conditions. An operational definition of these variables will further reduce them respectively to: an elevation to the post of professor for example, Grade level 16 or a cash equivalent of say N50, 000, number of times one has benefited from in-service training, and availability of good office accommodation for workers.

Obasi (1999) mentions the following as the functions of operational definition to research as follows:

- It promotes understanding of research by simplifying what would have appeared complex
- It gives specific and concrete meaning to concepts which would have appeared abstract and ambiguous;
- It promotes the manageability of a research work by limiting an array of meanings that variables would have assumed;
- It serves as a link between the theoretical and empirical sphere of research; and
- It enables hypotheses to be expressed and tested in specific, clear and purposeful manner.

Thus, one can surmise that, operational definition enhances simplification, manageability and understanding of scientific concepts and by so doing, serves as a bridge between the abstract theoretical world and the complex empirical world.

1.6 A variable

Variable is a concept (symbol or characteristic) whose values can vary. In other words, it is a concept that can take more than one value, a quality or characteristic that varies among the subjects of investigation. According to Buchanan (1980:14) a variable "is a concept broken-down into a number of quantitative values or qualitative categories so that each number of a class of phenomena may appropriately be assigned to a value or category". A qualitative variable according to Obikeze (1986:18) I"is one which takes on values that vary in kind rather than magnitude." And a quantitative variable "is one which takes on values that vary in terms of magnitude" he went further to give examples of each. Examples of qualitative variables are: qualification, occupation, political party affiliation, sex, social status, ideology, position (rank), religious affiliation, sex, nationality and political party. While on the other hand examples of quantitative variables are income, height, age, weight, distance, wealth, intelligence, and vote cast.

There are different types of variables.

A continuous variable is one that is capable of taking on an ordered and theoretically infinite set of values. Examples are the variables of age, income, casualty, height and weight.

A categorical (or discrete) variable on the other hand is one capable of taking on only a specific set of values of a discontinuous nature, with each value being individually distinct from the others. Examples are: sex, religion and marital status.

An independent variable is the presumed cause/influence/explanation of the dependent variable, whose values are presumed to be dependent on or affected by the independent variable. In other words, the dependent variable is the presumed effect or function of the independent variable. Other types of variables are competently explained in relevant texts.

1.7 Hypothesis

Hypothesis is a conjectural statement linking two or more variables (at least one independent and one dependent) in a hypothesized relationship. Much of scientific research involves the collection and analysis of data to uphold or falsify such hypotheses.

According to Lundberg (1951 cited in Biereenu-Nnabugwu, 2010) Hypothesis is an unsubstantiated generalization whose validity is yet to be tested or confirmed. To Kerlinger (1973:18) hypothesis "is a conjectural statement of the relation between two or more variables" Uzoagu (1998:41) sees hypothesis as an intelligent guess regarding some pertinent variable. Obasi (1999:51) defines it as "a tentative statement, which is subject to confirmation or rejection when exposed or subjected to empirical verification."

Concepts and variables constitute the building blocks of scientific research. While certain types of research (especially those involving non-quantitative data) can be conducted without hypotheses, which essentially link concepts and variables together, no research of a scientific nature can be conducted in the absence of concepts and variables.

As indicated earlier, the ultimate goal of scientific research is to discover powerful theories that provide explanation for observed phenomena.

1.7.1 Importance of Hypotheses

It is a working instrument of theory because it is deduced from theories and at the same time used in generating more specific hypothesis from an existing broad hypothesis.

Advances knowledge by rejecting/invalidating or accepting/validating theories.

It is a tool for the advancement of knowledge. Little wonder that Kerlinger (1973:20) avers that "there would be no science in any complete sense without hypotheses"
It serves as a guide for the orderly organization of data
It sharpens focus of the research

1.7.2 Sources of a Good Hypothesis

Through intuition. It a method of understanding something through feeling instead of careful observation or consideration of facts. It could come through accumulation of past experience which were suppressed in sub-consciousness.

Hypothesis can as well come through experience. After a researcher might have observed a particular phenomenon, like insecurity of lives and property, high cost of living, unemployment, etc such observation may put him in a vantage position to be able to formulate a hypothesis based on the observed phenomenon.

Literature review can also give a researcher hint on how to formulate a research hypothesis after determining the position of those that have worked in the area before, stating the research problem or identify gaps in the literature. It will help him/her to generate an informed hypothesis.
A researcher can generate good hypothesis after going through existing principles and theories in the area under investigation. The role of hypothesis in this context is to authenticate the truthfulness or otherwise of such a principle or theory.

1.7.3 Ways of Formulating Hypotheses

Hypotheses can be formulated in different ways depending on the nature of the problem under investigation and the amount of depth of search to which the investigators aspires. Suffice to say that there is no specification on how hypothesis should be structured and what it should consist of.

Obasi (1999) gives a vivid analysis of how hypotheses can be formulated. One can deduce from his analysis that:

Hypothesis can be formulated simply as a description of phenomena or a statement of fact. For instance, "the administrative style of early missionary schools was authoritarian".

Hypothesis can be stated in a comparative form. This comparison can be between two or more groups of persons, or institution or concepts. A good example can be "people of higher socio-economic status are politically more conservative than those from lower socio-economic status.

Hypothesis may also be stated based on the occurrences or association among variables. It may state that, something occurs in a certain number of times or occurrence of something can be accompanied by something else. That is to say, hypothesis can show the relationship between variables. For example, there is no significant relationship between the workers support for political parties and the increase in salary by the government after every election in five years.

Hypothesis can show a cause/effect situation between phenomena. That is to say, a particular occurrence is one of the factors which determine another occurrence. For instance, there is no positive correlation between length of service and morale.

1.8 Theory

Simply put, a theory is a set of interrelated concepts, definitions and propositions that present a systematic view of phenomena by specifying relations among variables with the purpose of explaining, predicting and controlling the phenomena (Kerlinger, 1977)

The natural and physical sciences have been more successful in theory-building than the social sciences and the humanities for obvious reasons. One reason is that human beings are definitely more complex and more unpredictable than such inanimate objects as rocks. Discovering theories that help to explain, predict and control such erratic entities becomes a very difficult task indeed.

A second major reason has to do with measurement problems, which are more acute in the social sciences than in the physical sciences. How do we, for instance accurately measure such things as unemployment, instability, extent of freedom, corruption and impact of public policy?
There are two major types of theories in Political Science viz: Empirical theories and Normative theories. Empirical sometimes refers to as

systematic theories, focus on facts, quantities and relationships. They are subject to hypotheses testing because they are amenable to empirical measurement and verification. Conversely, normative theories incorporate value judgments, goods and bad, should and should not type of issues. Normative theories deal with the" ought" questions and as such are not objectively amenable to empirical measurement and verification.

1.8.2 Theory Serves Some Purposes

Theory synthesizes isolated bits of empirical data into a broader conceptual scheme of wider applicability and predictability. It permits deeper understanding of data and translate empirical findings into a more readily understood, more readily retained and more readily acceptable form
Theory permits the prediction of the occurrence of phenomena and enables the investigator to postulate and, eventually, to discover hitherto unknown and unobserved phenomena.

Theory acts as a guide to discovering facts; it pinpoints crucial aspects to be investigated and crucial questions to be answered. By identifying areas in need of exploration, it stimulates research in areas that are lagging.

Theory is based on the assumption that detailed empirical findings are special cases of more general laws, and that progress cannot be made as long as observations are simply accumulated.

Just as facts underlie theories, theories underlie facts, each raising the other on a spiral to ever more precise scientific formulations.

1.8.3 Characteristics of A Good Theory

A good theoretical system must permit interpretations and deductions which can be tested empirically- that is, it must provide the means for its own interpretation and verification.

Theories must be compatible both with observation and previously validated theories. It must be grounded in empirical data which have been checked and verified and must rest on sound postulates and hypotheses. The better the theory, the more adequately it can explain the phenomena under consideration and the more facts it can incorporate in a meaningful structure of ever-greater generalizability. A good theory is one that has as wide applicability as the present state of knowledge will permit.

Theories must be stated in simple terms; that theory is best which explains the most in the simplest form. This is the law of parsimony. A theory must explain the data adequately and must not be comprehensive and detailed as to be unwieldy. On the other hand, it must not overlook variables simply because they are difficult to appraise. A theory must be stated precisely and clearly, if it si to serve as an adequate guide to research.

Scientific theories must be based on empirical facts and relationships. The mere accumulation of empirical data, however, constitutes neither theory nor science, until the data have been organized into general principles that permit the interpretation of particular phenomena on the basis of the operation of more fundamental underlying factors (Osuala, 1993).

1.9 Research Design

Research design is the blue print or guide on how to arrive at a solution to identified research problem. This is the section where a researcher takes a vital decision on how the research will be conducted. Apter (1978) cited in Biereenu-Nnabugwu, 2010) sees research design as a means through which strategy is converted to operational plan for fieldwork or an experiment. Kerlinger (1973) explains research design to include; an outline of what the investigator will do from writing the hypotheses and their operational implications to the final analysis of data. Ndagi (1984) contends that research design is simply a statement of research procedure. Bailey (1978:111cited in Biereenu-Nnabugwu, 2010) gives a more comprehensive definition of the term. He defines it as a plan that:

Guides the investigator in the process of collecting, analyzing and interpreting observations. It is a logical model of proof that allows the researcher to draw inferences concerning causal relations among the variables under investigation. The research design also defines the domain of generalizability, that is, whether the obtained interpretations can ge generalized to a larger population or to different situations.

Research design can be categorized based on the method of data collection that is predominance in such a design. Thus, they are:

- Historical research design
- Descriptive research design
- Survey research design
- Experimental research design
- Case study research design
- Causal research design

After determining the research design to be adopted, the following issues according to Obasi (1999:106) should be explained. They are:

(a). The area of study for quantitative designs. This may be a chapter of its own in qualitative designs under a heading the history, objectives and structure of an organization under study.
(b) The population of the study which requires researchers to state the subjects under study in terms of (1) what they are (i.e people such as teachers, civil servants, students, farmers etc or organizations such as Universities, Ministries, Local government councils, political parties, etc) and (ii) their total number (e.g) all teachers in Nsukka Local Government Areas etc)
(c) the sample size and sampling technique
(d) Pilot study (if done)
(e) Methods of data collection (i.e. their description).
(f) Methods used in enhancing the validity and reliability of instruments (methods) of data collection.
(g) Methods of data analysis (i.e. percentages, means, tables, graphs, or inferential statistical tools).

Self- Assessment Exercise

- Differentiate between a theory and hypothesis
- Explain probability and non-probability sampling techniques
- What are the characteristics of a variable?

1.10 Summary

This unit has articulated some basic concepts in research. Their comprehension by a researcher is central to the success of the research. For, every serious endeavor is founded on a strong foundation. The language of every academic discipline is its uniqueness, and it is necessary for political scientists to be acquainted with the language of discourse.

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1.12 Possible Answers to Self-Assessment Exercises

A theory is a set of interrelated concepts, definitions and propositions that present a systematic view of phenomena by specifying relations among variables with the purpose of explaining, predicting and controlling the phenomena.

A hypothesis is a tentative answer to a research question. Once tested and validated, it becomes a theory.

A probability sampling is a sampling method in which every member of the population has a known assurance of being included in the sample to be studied. Non-Probability Sampling is the opposite of the probability sampling technique because the likelihood or assurance of every member of a target population to be included in the sample is not known.

Variable is a concept (symbol or characteristic) whose values can vary. In other words, it is a concept that can take more than one value, a quality or characteristic that varies among the subjects of investigation.

Unit 2 Literature Review

Unit structure

2.1 Introduction

This unit is devoted to teaching you the art of literature review which is an indispensable activity in the research process. Going further, you will learn first, the meaning of literature review. Secondly, you will learn how to search for literature. Thirdly, you will learn how to present literature reviewed. This is necessary as originality is vital as well as using the works of previous scholars without committing plagiarism.

2.1 Learning Outcomes

At the end of this unit, students would be able to:

- Explain the meaning and function of literature review
- Analyse the sources and perspectives on literature review
- Acquire the skill necessary to review literature

2.3 Literature Review

2.3.1 Meaning of Literature Review

Literature review focuses on the analysis of the scholarly debate on the issues under investigation. Thus, Baglione (2007) argues that, literature review is neither paragraph summaries of the works of several scholars, nor description of different perspectives; it has to do with laying down in a coherent manner the different specific answers to the general questions as well as analyzing the logical strengths and weaknesses of these responses and note any similarities between them. At the end, the students should be able to point out which school of thought makes the most compelling argument and be able to defend why it is so. Suffice to say that literature review is an exploration of scholarly answers to the general questions.

Obasi (1999) sees literature review as the critical examination of previous studies done in the area of current concern. Through literature review, researchers are able to identify the various contributions made by other scholars and their limitations which now serve as gaps in the literature, through which new research problems which worth investigation can be discovered.

2.3.2 Functions of Literature Review

- It enables the researcher to know what has been done in a given subject area.
- It helps a researcher to know the solutions that may have been suggested or applied to the problem at hand.
- By revealing the state of knowledge on an issue being investigated, it saves the researcher from wasting time, resources and effort in solving problem that has been satisfactorily addressed.
- It helps a researcher to identify techniques, problem-solving strategies and methods of analysis which are applicable and have been tested so that if need be, the researcher can modify or broaden same to provide an elegant solution to the problem under investigation.

2.3.3 Sources and Perspectives on Literature Review

Literature review must survey scholarly literature. An investigator needs to rely on the works of academics. Although journalists and commentators may provide interesting answers and insights on issue(s) under investigation, they should not be the authors that should be cited at this stage, emphasis should be on established scholars.

Sources of Literature for Review include:

- Books and monographs
- Journals and periodical articles
- Academic research projects commonly referred to as dissertation, and thesis
- Government reports
- International Organizations reports (e.g., United Nations Organization (UNO) and some of its agencies)
- International Encyclopedia of Social Sciences
- Political Science Abstract

2.4 Perspectives on Literature Review

There are two contending perspectives on the nature of literature review according to Obasi (1999). They are:

2.4.1 Narrow or restricted literature review

Scholars of this persuasion like Strauss and Corbin (1990) advocates for review of limited and restricted literature to identify knowledge gaps in the literature with regards to the research questions, variables and their relationship that are to be tested. Although the ADF (1993) recommends a restricted kind of review of literature especially for a research proposal, it is advisable that academic research project provide a comprehensive review of relevant literature on the study.

2.4.2 Comprehensive or broad Literature review

Conversely to the above position is another version that is favourably disposed to comprehensive review of literature that such effort show that a researcher is an expert in certain area of research by demonstrating a mastery and dexterity of the subject matter.

It is important to note that literature review can be done thematically or chronologically.

Thematic review of literature is done by arranging issues base on their commonality or similarity of ideas. This approach aids understanding as readers can quickly go into the sub-headings without wasting much time.

The second approach is the chronological style which emphasizes dates, era or epochs within which existing works were carried out. This style gives a researcher the opportunity to document the origin and development of phenomenon under investigation.

2.4.3 Writing Literature Review

In writing literature review section, a researcher is to answer the following questions as stated before:

1. How have important scholars answered my general research questions? What are the most important schools of thought and who are identified with them? What is an appropriate label for this group of authors and why?
2. What are the strengths (logical or explanatory) of each school of thought? What are the weaknesses?

3. What are the gaps and limitations in the literature reviewed? Having the aforementioned in mind, the researcher can then proceed to title the section "literature review"

After the title, you need to provide an introduction to the section that explains that there are scholarly debates on your research question, discuss them bringing their strengths and weaknesses to the fore, and tell us the gaps you identified and how your work will fill this gap or gaps. This section can be organized thematically or chronologically.

2.5 Theoretical Framework

The importance of theoretical framework to a research study cannot be over emphasized. It simply means, situating the work into analytical framework of analysis. According to Varma (1999), theoretical framework is first analytical, is a set of principles or conceptual pattern and it assists in explanation and prediction of a reality. It is indeed a guide to political inquirer. It helps in the collection and organization of data and in the integration of political phenomenon in a cohesive systematic manner (Biereenu-Nnabugwu (2010).

Aloysius-Michael (2016:80) states that, there is a nexus between theoretical framework and literature review. He avers that, the following items should be included in literature review grounded in theory:

- A brief statement of your topic
- An introduction to the organization of the literature review
- Identification of your chosen theoretical framework (defines the theory, identifies key theorists, history of theory)
- Specification of key theoretical principles to be applied to your topic, organized around conceptual subheadings
- Identification of conflicts and controversies in the literature
- Identification of gaps in the existing literature
- In the last paragraph only, an explanation of how your proposed study connects to existing literature**.**

Self-Assessment Exercises

- What is role of literature review in research?
- Discuss the main perspectives in literature review
- Examine the relationship between literature review and theoretical framework

2.6 Summary

In this unit, you have learnt how to review literature. Central to this goal is to find appropriate literature for review, identifying most important scholars involved in the debate, understand the different answers to the research problems given by these various scholars, knowing the different schools of thought they belong by determining the key factors that unite and divide them. This will help you to know the gap(s) in the literature and how your study will serve as an intervention in closing this knowledge gap(s). the study has also taken a look at the theoretical framework and the relationship between theoretical framework and literature review.

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2.7 Possible Answers to Self-Assignment Exercises

1. Literature review lays down in a coherent manner the different specific answers to the general questions as well as analyzing the logical strengths and weaknesses of these responses and note any similarities between them.
2. Narrow or restricted; and, Comprehensive or broad perspectives.
3. While literature review helps researcher in identifying existing gaps in research area, the theoretical framework provides an analytical platform for the researcher to carry out the study.

Unit 3 Citation Skills in Research

Unit structure

3.1 Introduction

It is important as a researcher to include a reference list or Bibliography of the reference materials you consulted in the course of your research. Hence, this section is meant to teach you how to do exactly just that. This section introduces you to the various methods of referencing.

3.2 Learning Outcomes

At the end of this unit, you will be guided on:

- The importance of Bibliography
- Different methods of citation
- Style of making reference

3.3 Meaning, Importance and Functions of Bibliographical Citations

3.3.1 Meaning of Citation

Generally speaking, citation is the art of borrowing ideas from the works of others in line with the canons of scientific research which may appear in form of Notes, reference and Bibliography.

3.3.2 Importance of Citation

You will recall that literature review section of a research necessitates borrowing ideas from different authors which in a way, link up previous studies with current or ongoing studies, this section is about acknowledging the sources where we borrowed ideas.

The importance of bibliographical citation cannot be overemphasized, as knowledge is cumulative.

Thus, knowledge grows by building on the existing ones. There is no good research that exists in a vacuum, in fact, findings of today's research, add value to those of yesterday.

The functions of bibliographical citation include:

- By providing theoretical and empirical support, it enriches an ongoing work.
- It gives direction to an ongoing work by providing historical foundation
- It serves as a mechanism to legitimize and justify ideas expressed in an ongoing work
- It provides the basis for explaining and interpreting ideas or findings in an ongoing work
- It serves as an enduring means through which knowledge can be transfer and transmit from one generation to another generation.
- Bibliographical citation brings to a reality the cumulative character of scientific research.

3.3.3 Types of Bibliographical Citation Methods

1. The Use of Notes

The use of what is called Notes is one of the methods of citation. It may appear as footnotes or endnotes. The difference between footnotes and endnotes is that, while footnotes appear at the bottom of the page in which an idea has been referred to, endnotes appear either at the end of the chapter or at the end of the entire work.

Such notes, whether footnotes or endnotes could be a mere explanatory statement, clarification or an actual citation of unpublished or published works. Explanatory notes are meant to explain useful or relevant issues. the reason is to clarifies in order to enhance understanding of issues being discussed. Notes may be used to explain assumption made while writing or existing controversies associated with issues being discussed or problem that accompany generating such ideas. One of the advantages of footnotes is that, reader can easily see it at the foot of each page if he/she wants to read the cited works or explanations. It is however, problematic when there is an elaborate textual reference or documentation. The researcher while typing would have to divide the page into two proportionate part to accommodate the main ideas expressed in the page and the footnotes. On the other hand, endnotes as it were, eliminate the problem of spacing at the bottom or dividing the each page to accommodate express ideas and notes as the case under footnotes, however, readers cannot expeditiously get to the reference.

2. The Use of References

Although all citations whether notes or bibliography are references as they are relevant works consulted during the write-up of a research report. When Notes do not carry explanatory or clarifying statements with actual citation of works, they are called references

In addition, references and notes (endnotes) can be placed at the end of each chapter for a work arranged in chapter by chapter, while bibliographies are positioned at the end of the entire work. Biographical list appears just once and it encapsulates citations made which appeared in notes or references in the different chapter of a book.

In summary, when any work uses reference as a heading instead of notes or bibliography, the list of works cited does not carry explanatory note along with the actual citations. Consequently, the works cited are arranged in a chronological order. The names of authors cited are arranged starting with the surname of each of the authors, initials, year of publication, the title of the work, if it is a journal article, the name of the journal, then the volume number, issue number and pages of the article. If is is an edited book, the pages of the article will reflect. If it is a book, the pages will not reflect but the place of publication and the publishers. This is also applicable to edited books.

1. Notes and References

At times, bibliographical citations can be captured under the combined heading “Notes and References”. This is to indicate that explanatory notes are actually involved in addition to citations of works.

2. Bibliography

Generally, bibliography is the list of cited works and un-cited but relevant works arranged in alphabetical order using authors’ surname and placed towards the end of a research report, journal articles, books or conference papers.

According to Le Vine (1971cited in Obasi, 1999:208-209), bibliography is expected to serve the following purposes among others:

- It provides a list of materials used in the preparation of a text;
- Provide a list of materials that would supplement a text; and
- Provide a list of relevant materials on some given topic or subject.

3.3.4 References Styles

There are different styles of citing documents or works. They are; the classic or Turabian style, the Modern Language Association style, and the American Psychological Association (APA).

1. The Classic or Turabian Style

This method involves numbering the cited works in a chronological order in the text and arranged in that order under references or Notes. This method is unique in the sense that, it makes use of Latin terms usually in abbreviated form. Some of these Latin terms include:

- **Ibid**: which is the short form of **Ibidem**, meaning the "same", this is used when a citation is exactly the same as the one immediately preceding it. That is to say, a reference is made to a work and the one that follows it immediately did not change, i.e, the same, then Ibid is used.
- **Op.Cit:** this is a short form of **Opere Citato meaning the** "work cited earlier" this is used an author has made references to other works in between a work cited before and a new citation on it.
- **Vide:** this means "see". For example, **Vide** Obasi p213.
- **Sic:** is used to show that something quoted albeit with errors which could be spelling error but quoted exactly the way it appears (with the error).
- **N.**B is the short form of **note bene** meaning "note well"
- **Et al:** is an abbreviation of **et alibi**, meaning and others. This is, when an article or a book has more than the number of authors or editors mentioned. E.g., let us assume an article has six authors and the researcher using the work reflect one or two of the authors then put et. al.

Arrangement of references in Turabian style is done this way:

a) author's name come first (starting with first name)
b) Title of book or article etc.
c) Where publisher is located
d) Name of Publisher
e) Date of Publication
f) Page where citation is drawn**.**

2. The American Psychological Association Style (APA) Citation Style

This is also called the triple entry as it reflects author's surname, date of publication and page of citation in the main body of the text. Instead of

using serial numbers for authors cited, their surnames, year of publication of their works and the pages were necessary. Obasi (1999) stated that it is because of this the style is called "author-date-page style".

Under this style (APA), the arrangement of bibliography is done in this order:

a) author's surname is written first (for two or multiple authors) authors first names are written first;
b) authors names are arranged in alphabetical order;
c) paginations are not included in the list of bibliography having appeared already in the text;
d) the year of publication comes immediately after the authors' names in bracket;
e) the use of Ibid, Po.Cit among others are avoided;
f) Irrespective of how many times an author is cited, he or she appears only once in the bibliography except when more than one works of such author are cited;
g) It permits the use of multiple authors if their ideas are the same or very similar for instance, Obasi (1999), Biereenu-Nnabugwu (2010) Dlakwa (2015) are all in agreement that poverty has been a major problem confronting Nigeria.

The strength of this style however, includes;

- The reader can see immediately the author of an idea, the year and the page were necessary
- It allows alphabetical arrangement of authors consulted at the end of each chapter and at the end of the entire work;
- This style of referencing is easy and elegant.

This is just a guide as there are different editions of APA. Like 4^{th}, 5^{th}, 6^{th}, 7^{th} editions to mention just a few.

3. The Modern Language Association Style

The acronym for this style is MLA. This reference style was developed by the Modern Language Association of American. It is therefore, not a surprise that it is used mostly in modern language, but some disciplines have also found it as a useful style of referencing. This style of referencing uses ibid as well, just like the Turabian style.
It uses the author's surname plus page and volume for journal.

Self-Assessment Exercises

1. How important is citation in research?
2. What is the difference between notes and references?
3. What distinguishes the APA from MLA reference styles?

3.4 Summary

3.5 References/Further Reading/Web Resource

Obasi, I. N. (1999) Research Methodology in Political Science, Enugu: Academy Publishing Company.

Oluikpe, B. (1980) Thesis Writing: Form and Style. Onitsha: Africana Publishers Ltd.

3.6 Possible Answers to Self-Assessment Exercises

1.

- It gives direction to an ongoing work by providing historical foundation
- It serves as a mechanism to legitimize and justify ideas expressed in an ongoing work
- It provides the basis for explaining and interpreting ideas or findings in an ongoing work.

2. Notes may be either footnotes or endnotes. The difference between footnotes and endnotes is that, while footnotes appear at the bottom of the page in which an idea has been referred to, endnotes appear either at the end of the chapter or at the end of the entire work. But when Notes do not carry explanatory or clarifying statements with actual citation of works, they are called references.
3. The APA is also called the triple entry as it reflects author's surname, date of publication and page of citation in the main body of the text. But the MLA uses the author's surname plus volume and page for journal. It also uses the ibid.

MODULE 3 TYPOLOGIES OF RESEARCH, CHAPTER OUTLINE AND RESEARCH ETHICS

Unit 1 Typologies of Research
Unit 2 Chapter Outline
Unit 3 Research Ethics

Unit 1 Typologies of Research

Unit structure

1.1 Introduction
1.2 Learning Outcomes
1.3 Main Content
1.4 Summary
1.5 References/further Reading/Web Resource
1.6 Possible Answers to Self-Assignment Exercises

1.1 Introduction

There are different types of research which are also called typologies or classificatory schemes. The essence of typologies or classificatory scheme is to identify and present different phenomenon based on their characteristics which may be similar or contrasting within the specific typical groups. Thus, typologies are sets of an issue differentiated based on certain criteria.

1.2 Learning Outcomes

At the end of this unit, the student will be able to:

- Differentiate between the different types of research,
- Identify the strengths and weaknesses of the various typologies of research,

1.3 Typologies of Research

Obasi (1999) categorized research as either pure (basic) or applied. Each is based on the purpose(s) of the research, which can be purely intellectual (for knowledge advancement) or practical-oriented, that is, problem-solving. Research may also aim at achieving both objectives simultaneously. When research is concerned mainly with the goal of seeking knowledge or simply to satisfying intellectual curiosity, it is termed pure or basic or academic research. The desire is to know or

understand. The aim is to advance or widen the scope of knowledge in a field through the test of hypothesis. Here, theories are either verified or repudiated. Such research helps to transmit knowledge from one generation to another.

Conversely, applied research is conducted for the purpose of finding solutions to specific problems. The knowledge it seeks for is to do something better. Pure and applied researches reinforce each other, as observed by Seltz, et al (1974). To him, historically, scientific enterprise is both concerned with knowledge for knowledge's sake and knowledge for the purpose of proffering practical solutions to societal problems.

1.3.1 Quantitative Research

The quantitative approach investigates phenomena that are amenable to empirical measurement (variables that can be assigned figures or values) and verification and (can be empirically observed and verified). Quantitative research is highly rigorous, sophisticated and places emphasis on statistical data and testing of hypotheses. This approach is straight forward in data collection and analysis.

1.3.2 Qualitative Research

Conversely, qualitative research is the type of research in which variables are not objectively amenable to empirical measurement and verification. Its application is mostly on non-statistically based data which can as well be empirically studied. It uses deductive or inductive logical method to prove its hypotheses since such hypotheses cannot be tested in a statistical sense.
Bassey and Ndiyo (2016) however states that research can combine both quantitative and qualitative methods together. This is called mixed methods research. It involves philosophical assumptions, the use of qualitative and quantitative approaches, and the mixing of both approaches in a study. This approach goes beyond just collecting and analyzing both kinds of data; it also involves the use of the two approaches in tandem so that the overall strength of a study is greater than either qualitative or quantitative research.

1.3.3 Experimental vs Non-Experimental Research

Experimental research is the most scientifically sophisticated research method. It is often confused with the scientific method by the layman who equates experimentation with the physical sciences and further equates the physical science with science itself. The reason for this erroneous viewpoint is premised on the fact that, the first step in setting up experimentation as the ultimate in research were taken from the

physical sciences. Despite its scientific rigor, experimentation is only one aspect of the scientific method which itself involves a great number of activities.

Looking at the history of experimentation Osuala (1993) opines that, one of the first recorded "experiments" was apparently conducted by Galileo who in 1589, demonstrated that bodies of the same substance fall at identical rates of speed regardless of their mass. Other early studies include that of Pasteur, who discovered that food spoilage can be attributed to bacteria. In the field of medicine today, the testing of drugs and vaccines is generally based on a relatively simple experimental design.

Experimentation research is the type of research that necessitates taking action with the goal of influencing a phenomenon under study and also observing the consequence of the influence. It has three essential components which are:

1) Experimental and control group
2) Independent and dependent variables
3) Pre-testing and post-testing exercise or activity.

Experimental method of research is the main type of research used by researchers in the physical, biological, medical, agricultural and engineering sciences as well as in some disciplines like Education, Geography and Psychology.

Non-experimental research on the other hand does not require the use of experimental and control group. However, it uses dependent and independent variables in its investigation.

1.3.4 Historical, Descriptive and Ex-Post Factor Research

Historical According to Osuala (1993:137) the Greek word "historia" (which is synonymous to history) means "a searching to find out". It therefore not a surprise that Whitney (1948) sees historical research as interpreting past trends of attitude, event, and fact. History is therefore, the integration or description of past events or facts written in a spirit of critical inquiry for the whole truth. It involves explaining and evaluating past events for the purpose having a better and clearer understanding of the present and making a more reliable prediction of the future. Historical research entails the use of qualitative hypotheses, critical analytical method and interpretation of findings.

There are two major sources of historical data. They are: primary and secondary sources. Primary sources include eye-witness account and

participants and historical objects (like relics, artifacts) that are subjected to examination. Secondary sources are: events observed by another person that are recorded, data from archival records, newspapers, books, periodicals etc.
It is good to subject historical data to internal and external test for validation so as to ascertain their objectivity. This is necessary in order to prevent people from reconstructing historical events for selfish reasons.

Purposes of Historical Research:

- There are some present problems that can only be understood by taking a historical excursion into their origin and trends. Thus, to appreciate the nature of some problems, it is better to dig into their past. Historical research can provide us not only with hypotheses for the solution of current problems, but also with a greater appreciation of the culture and of the role which new knowledge can play in the progress of society.
- Scholarly interest on the past events can trigger the need for historical research so as to get accurate account of the past. It does not limit itself only to what happened in the past, but also link the past to the present and predict the future.

Descriptive Research

Descriptive research is that research which specifies the nature of given phenomena. Descriptive research according to Best (1970) is concerned with:

Conditions or relationship that exist; practices that prevail; beliefs, points of view or attidues that are held; processes that are going on; effects that are being felt; or trends that are developing. They look at individuals, groups, institutions, methods and materials in order to describe, compare, contrast, classify, analyze and interpret the entities and events. Descriptive research involves data gathering for the purpose of describing and interpreting existing conditions and beliefs, practices and attitudes that are prevalent.

Ex-Post Facto Research

Kerlinger (1977) explicates Ex-Post Facto research as a form of descriptive research in which the occurrence of known independent variable triggers investigator to observe the dependent variable then conduct a retrospective study on the independent variable so as to establish any possible relationship and effect on the dependent variable. This is in line with the position of Cohen and Manion (1980) that Ex-

Post Facto means "after the fact" or "retrospectively" it makes reference to those studies which investigate possible casue-and-effect relationship through observation of an existing condition and searching back for possible causal factors.

Self-Assessment Exercise

1. Differentiate between qualitative research and quantitative research
2. What differentiates historical from descriptive research?
3. Is experimental research relevant to the social sciences?

1.4 Summary

We have seen from this unit that there are different types of research. However, it is necessary to state that the type of research is a function of the nature of study which has implications on the methodology that will be employed.

1.5 References/further Reading/Web Resource

Obasi I.N. (1999) Research methodology in Political Science, Enugu: Academic Publishing Company.

Bassey, C., and Ndiyo, N. (2016) "Research Design: Types and Application" in Okolie, A., and Ajene, O.G. (eds) Research Methodology in Social Science Analysis. National Political Science Association. Pp. 98-113.

Best, J. (1970) Research in Educations. New Jersy: Prentice-Hill.

Cohen, L. and Manion, L. (1980). Research Methods in Education., UK: Croom Helm.

Kerlinger, F. N. (1977) Foundation of Behavioural Research, New York: Holt, Rinehart and Winston.

Selltiz, C. et at. (1974) Research Methods in Social Relations, London: Methuen and Co.Ltd

Whitney, F. L. (1948) The Elements of Research. New York: Prentice-Hall.

1.6 Possible Answers to Self-Assessment Exercises

1. The quantitative approach investigates phenomena that are amenable to empirical measurement (variables that can be assigned figures or values) and verification and (can be empirically observed and verified). Since hypotheses cannot be tested in a statistical sense in qualitative research, it uses deductive or inductive logical method to arrive at its findings.

2. Historical research attempts to get accurate account of the past, and also link the past to the present with a view to predicting the future. On the other hand, descriptive research specifies the nature of given phenomena. It does not only describe, but also compare and contrast phenomena.

3. Experimental research is more applicable to the natural science because it requires taking action with the goal of influencing a phenomenon under study and also observing the consequence of the influence. Since humans can hardly be subjected to such laboratory controls, it is difficult to apply the method in social science research. However, some social science disciplines such as Geography do adopt it.

Unit 2 Chapter Outline of Research Report

Unit structure

2.1 Introduction

Research Report is always divided into chapters. This unit presents the common format of chapter division of research report. This unit is to teach you how research report is divided into chapters so that everything will not be lumped together. There are some items that ought to be in the different chapters of a research report. Although some scholars' present different format for both quantitative and qualitative research, this unit is however, a presentation of general format for both quantitative and qualitative research.

2.2 Learning Outcomes

At the end of this unit, students should be able to:

- Understand the major divisions of the research report geared towards the award of academic degree
- Identify the items that supposed to be in each chapter of a research report

2.3 Formulating Research Topic

Before the outline of a research report it is important to state that, a topic has to be formulated. The question is, how do we craft a research topic? The researcher should be aware that a good research topic has the following qualities: interesting (the topic must be of interest to you), important (your research topic should be important to you, other scholars, policy makers and citizens) puzzling (e.g. why are the rate of electoral success of Nigerian women lower than those of females in some other countries? Or why did Russia invade Ukraine?), and finally,

it should be short and direct. You can arrive at a research topic through different means. You may develop an interest in an issue after reading some books, journal articles, listen to news stories or after intellectual discourse with collogues, or on your favorite course, etc.

2.4 Chapters in a Research Report

2.4.1 Chapter One

The introductory chapter consists of the following sub-themes:

a. Background to the Study/General Introduction

Basically, the introduction introduces the reader to your research project or dissertation. It does so by communicating the puzzle you are investigating, usually not in a question form. 3 Background to the study is the section that provides the context of the problem under investigation. The essence of background to the study is to tell us where we are coming from by providing antecedent to the problem. It serves as a bridge between the past-related-issues and the present problem under study. Background to the study is different from statement of the problem. Background to the study focuses on the "How" related issue and not on the "Why" of the issue. It describes by taking a historical excursion into the past issues that have bearing on the problem. It should be logical but not analytical.

b. Statement of the Problem

This is very crucial to any research endeavour. It is the fundamental question that requires an answer. It is necessary for a researcher to have understanding on how to formulate a research problem. Research objectives and hypotheses revolve around the statement of the research problem.

To (Obasi, 1999), there are three styles or approaches to statement of the problem:

Argumentative- by raising doubt to what apparently exists, or disagreeing right away from what apparently looks accepted.

Declarative- by making assertive statement(s) from a perspective of school of thought, which is of course subject to further investigation.

Historically analytical- by critical looking at antecedence to an issue.

Statement of the problem tends to narrate the impact of the problem on the human or physical environment, the attempt made hitherto to solve the problem, and why the problem remains a problem. The statement of the problem entails the research problematique. This section should endeavor to answer the question of why the study. The researcher should try to convince the academic community that there is need for the study. Statement of the problem also provides the context within which we pose research questions. Hence, research questions follow statement of the problems. The researcher is encouraged to join in the academic debate in the subject expressed in the literature review to state the problems of the study. Hence, some scholars insist that statement of problem is an abridged version of the gap in the literature review.

Where to find research problem- through reading of current journals, latest books on the issue(s), listening to radio/television news and programmes among others.

Research Questions

Research question is the focal question a research project is intended to answer. It is a question developed for a survey or an interview protocol. The research question helps to determine what is to be included or excluded in the research project. If you have no question to ask, then you have need for research because all researches are predicted on questions. Questions are unknown concept that needed to be known. The puzzles, the confusion that needed to be cleared. A question that needs to be answered. The questions that we are encouraged to ask are the ones that have not been satisfactory answered in the existing literature. Question can come from reading literature, research and writing of other scholars.

Qualities of a good research question

It must be stated in interrogative form;
It must state clear relationship between two or more variables
It must have clear indication for empirical verification
It must have potential to contribute to knowledge and theory development.

Examples

Why did corona virus infect Nigerians?
Did the entrance of the Italian victim account for the infection of Nigerians by the virus?
The second question has clearer implications for empirical verification and hypothesizing. It has clearer indications for verification with cause-effect relationship.

Researcher also needs to find out the following: is it a worthwhile question? Is the question answerable? Are there ethical issues involved in research on this question? Is there a clear reason for asking thi question? What is already known about this issue? What assumption exists in what is already known? Etc.

The Objectives of a Study

The objectives of a study are also the purpose of study. Some universities also refer to this section as aim of the study. It derived from the research questions. It specifies the obligation of the research which in turn evolves from the statement of problem. This means that the research objectives further specify and clarify research questions in terms of the end result of the research. It is usually stated in broad and specific terms. The broad objective derives from the focus stated at the end of background to the study while the specific objectives derive from research questions. The specific objectives of a research are stated item by item in line with the number of research questions posed using phrases such as to: identify, compare, examine, investigate, establish, explore, determine, ascertain, describe, find out, explain and analyse. There is usually a relationship between statement of the problem, research questions, purpose of the study and hypotheses or propositions. The next item in some universities is the hypotheses.

Research Hypotheses

A hypothesis is an informed guess. It is a guess based on fore-thought and reflections which suggests that you have to think over it. It is a tentative answer to a question, task or problem with implications for verification. It is always stated in a declarative form. It is stated to explain relationships between variables in the question. It deals with what is. The theory of research informs the hypothesis to be tested. It is derived from the research question.

Qualities of a Good Hypothesis

It must clearly state a relationship between two or more variables
There must be availability of data
It must be empirically measurable
We have two types of hypotheses:
Null hypothesis- the hypothesis to be tested are always stated in a negative form
Alternate hypothesis- this is a reverse of the null hypothesis.

Significance of Study

Significance contains the benefits of the study, here the researcher foresees the gains of implementation of the recommendations of the research. The significance of the study is also called the justification for the study. If a study has no or marginal contribution, there is a tendency that the study will not be interesting and worth pursuing. The study should fill knowledge gap. The contributions of the study to knowledge must be line with the specific question of research.

Scope and Limitation

This has to do with the coverage of the research. It could be time based or issue based. While limitations are some of the challenges the researcher encounter in the process of conducting the research, what he tries to do so that such will not affect the validity of the research.

Organization of Study

This is the arrangement of the research report in chapter for. A brief summary of what each chapter contains.

2.4.2 Chapter Two

This chapter detailed the review of literature and the theoretical construct on which the study is anchored. The section on literature review has done justice to this chapter.

2.4.3 Chapter Three-Research Method

While chapter two is on literature review and theoretical framework, chapter three is on research method (the method for carrying out the research). It all depends on the format of the institution a student belonged. In some institutions, if it is a qualitative study, the research method may be subsumed under chapter one. This section of a research presents the design of the research whether it is a survey design, archival research or documentary design, experimental design among others.

This particular section encapsulates: the area of study in the case of quantitative designs. In a qualitative design, this may be a chapter of its own, and it captures the history, objectives and structure of the study.

The population of the study which indicate what they are (civil servants, farmers, students, teachers or organization like Ministries, universities, Local Government etc. and their total number is also captured under this section.

If the entire population cannot be studied, the next thing is to embark on sampling. This section depicts how the sample is determined and sampling technique. If pilot study is to be conducted or already conducted, it also reflected under this section. Methods of data collection, methods adopted to enhance the validity and reliability of instruments of data collection and methods of data analysis like inferential statistical tools, percentages, means, tables, graph etc.

2.4.4 Chapter Four-Data Presentation, Analysis and Discussion

Data are generally collected for research through various means and they categorized as primary or secondary. Details of this can be seen under the section on data collection. However, data collected are in raw form and are useless if they are not analyzed, summarized and presented. Erricker (1981:26) itemizes four methods of classifying data which are classification based on time, geography, quality or attribute and quantity.

After the data are classified, they are presented on tables like frequency tables. Afonja (1975) highlights the features of table for data presentation to contain the following: it must have a title or subheading which should state what the data is all about. It must contain columns and rows with attached sub titles and units of measurements. The source where data was collected should be stated.

Quantitative data can be collected and analyzed using descriptive or inferential statistics. The nature and the set objectives of the study will determine the choice of the method(s) to be adopted between the aforementioned. If the purpose of the analysis is to investigate or examine the features and describe these features, then, the appropriate method to be employed is descriptive statistical analysis. These include the measure of central tendency which encapsulates, mean, median and mode. The analysis of data can be done at both grouped and ungrouped level. Measure of variation and dispersion can also be used to analyze data descriptively. The sub tools that are used under this to analyse data are range, mean deviation, variance and standard deviation which can as well be done at grouped and ungrouped levels. Ratio, percentages coefficient of variation are other techniques that can also be used.

Having adopted the right statistical techniques and tools for data analysis, the researcher or analyst takes the pain to sieve the message to be communicated based on the result of the analysis, that is to say, interpreting the message by making some inferences from the data about the variable under investigation to see if there is a relationship between two variables. The conclusion that will be drawn from the study is a function of the interpretation of the data analyzed. Consequence upon

the findings and conclusion(s) on an investigation is the generation of recommendations. Recommendation hinges on what to do and who are the key players in what to do, are they individuals, institutions, agencies or government.

Self-Assessment Exercises

- Differentiate between the objectives of a study and the statement of the problem
- Formulate a set of research questions to a research topic.
- What does the term significance of study mean in research?

2.5 Summary

This unit discussed the organization of research report from the conception of a research topic to the presentation of findings.

2.6 References/further Reading/Web Resource

Oni, M. A. (2016) Review of Importance of Statistical Inference and Hypothesis Testing in Political Science Research in Okolie, Aloysius-Michaels and Ajene Oga Godwin (eds) Research Methodology in Social Science Analysis, Nigerian Political Science Association.pp.137-158

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Obasi, I. N. (1999). Research Methodology in Political Science. Enugu: Academic Publishing Company.

Strauss, A. and Corbin, J. (1990) Basic of Qualitative Research: Grounded Theory Procedures and Technique: Beverly-Hills: Sage Publications

Varma, S.P. (1999) Modern Political Theory. New Delhi: Lit Verlag

2.7 Possible Answers to Self-Assessment Exercises.

1. Objectives are the aims or purposes of a research, while the statement of the problem is the background information of the puzzles that engendered the researcher's interest in the topic of research.
2. An example of a research topic could be: Vote-Buying and Party Politics in Nigeria's Fourth Republic.
   Research Questions on the topic could be:
   - What was the impact of vote-buying on the outcome of party primaries in Nigeria's fourth republic?
   - How can the incidence of vote-buying by the political actors be curtailed in Nigeria's electoral process?
3. Significance of study connotes the justification or importance of the study. That is, what makes the study unique, and its relevance to policy, society, academia etc.

Unit 3 Research Ethics

Unit structure

3.1 Introduction

Ethics has to do with the basis for judgments of rightness or wrongness of a conduct or an action. Every human endeavour has rules or ethical principles governing its conduct. That is why as a researcher, it will be necessary for you to be acquainted with rules governing the conduct of research, and that is exactly what this section is meant to achieve.

3.2 Learning Outcomes

At the end of this unit, the student will be able to:

- Explain ethics and ethical conduct. in research.
- Identify ethical principles governing the conduct of research.

3.3 Research Ethics

Ethics is a branch of philosophy that studies moral behavior of human in society. Research ethics according to McNabb (2004:55) refers to "the application of moral standards to decision made in planning, conducting, and reporting the results of research studies. Ogunji (2013:87), states that "research ethics provides guidelines for the responsible conduct of biomedical research. This is applicable to other disciplines that conduct research. One can extrapolate that irresponsible conduct in research is unethical. Unethical behavior can therefore be described as scientific misconduct.

3.3.1 Ethical Principles in Research

1. Respect for Rights and Autonomy

This principle is predicated on the rights and privileges that individuals enjoy because they are human beings. These rights are also most times legally guaranteed. In social science research and political science research in particular, the subject of research are living beings like the

researchers, are. The implication of this is that, as human beings, they are free moral agents. They are free to choose to participate or not to participate in any research effort. Thus, any measure taken by a researcher to induce participation like given large sum of money or mask a research activity is a violation of the principle of autonomy.

2. Beneficence

This is also referred to as "do-no-harm" principle. It has to do with ensuring and securing the well-being of research subjects and to stay clear of activities that are inimical to the research participants. The researcher should strive to minimize harm and maximize potential benefits to research participants. It is necessary to state that, human rights are placed above the benefits of such research to humanity.

3. Justice

People who have borne the risk of research should also share in the benefits such research activities will accrue. Those that participated in research should first be partakers of the benefits of such researcher.

4. Ethical Conduct

a. Voluntary Participation

No one should ever be coerced to participate as a subject in any research activities. It is a matter of one's' volition. Thus, individuals have the right to choose whether to participate or not. It should not be done under duress and researcher should not capitalize on the conditions of the vulnerable population by using them for research without their express permission, and the researcher should not go through authority figures in order to compel their involvement.

b. Do no harm

The onus lies on the researcher to make sure that any harm that may be associated with the research participants in the conduct of the research are removed. Such harm could be psychological or physical. Such may even be difficult to resolve in the process of the research or immediately after the conclusion of the research.

c. Informed Consent

Informed consent encapsulates the aforementioned points. To make any research endeavour ethical, it is necessary to get the express consent of research participants. Full and accurate information about the purpose,

design and potential risks and benefits of the study should be made known to the participants. It also includes the freedom to opt out in the mid-way to the research.

d. Anonymity and Confidentiality

This simply denotes that, the research participants should not be linked with their responses in anyway, either by the researcher or readers of the research findings. Confidentiality come to play in a situation where the researcher is able to identify in specific terms, responses of respondents but decided not to disclose such publicly but for the purpose of analysis of data.

e. Veracity

Veracity means truthfulness. Deception violates the ethic of research and should be avoided like a plague. Researcher should not mask his identity; he should report accurately his findings as well. Although in some exceptional cases, information may be withheld temporarily for security reasons, however, researcher should not falsify data**.**

f. Professional Fidelity

Researcher should be professional in handling research report. Data should not be manipulated and research findings should not be distorted in the research report. The researcher should be honest and should not make claims about data that are not tenable. Researcher has the onerous responsibility to disclose the limitations and delimitations of his study.

g. Plagiarism

Plagiarism is an unethical conduct which includes unauthorized and unacknowledged use of another scholar's ideas and material. For instance, all works consulted should be properly acknowledged. Whether the researcher quotes other scholars verbatim or paraphrase their ideas, they must be acknowledged.

Self-Assessment Exercise.

1. Explain the significance of ethical conduct in research.
2. What are those principles guiding ethics in research?
3. Identify three behavioural tendencies that have impact on ethical conduct in research.

3.4 Summary

The unit discussed ethical issues in research, notably, the principles of ethics and what behaviours and practices constitute ethical conduct. It is important to note that, adhering to these ethical principles is a prerequisite of any research endeavour as the consequence could be more grievous than imagined.

3.5 References/Further Reading/Web Resource

LaFollette, M.C. (1994) The Politics of Research Misconduct: Congressional Oversight, Universities and Science Journal of Higher Education 65(3); 261-65.

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Ogunji, J. (2013). "Reseach Ethics" in Ogunji J and Ogba Ike-Elechi (eds) Academic Research Supervision, Abakaliki, Ebonyi State University School of Postgraduate Studies. Pp. 67-99.

Yacob-Haliso, O. (2016) "Introduction to Research" in Okolie Aloysius-Michaels and Ajene Oga Godwin (eds) Research Methodology in Social Science Analysis. Nigerian Political Science Association. Pp.1-20.

3.6 Possible Answers to Self-Assessment Exercises

1. Without ethics, research becomes an adventure in sophistry. Logic, truth and honesty become the casualties.
2. A. Respect for rights and autonomy; B. beneficence; C. Justice.
3. A. Voluntary participation; B. Professional fidelity; C. Plagiarism.

MODULE 4 METHODS OF DATA COLLECTION

Unit 1 Questionnaire

Unit structure

1.1 Introduction

One major instrument for collecting data especially for quantitative research is questionnaire. This unit focuses on the principles, design, strengths and weaknesses of this research instrument.

1.2 Learning Outcomes

At the end of this unit, students should be able to:

- discuss questionnaire as an instrument for data collection
- identify the principles governing the use of questionnaire as instrument for data collection.
- explain the strengths and weaknesses of questionnaire as instrument for data collection.

1.3 Questionnaire

This method, which is also called mail questionnaire is an instrument which consists of standardized, uniform and carefully worded questions called the questionnaire, a copy of the questionnaire can be handed over to every member of a sample or respondent group or send to each of them by post with a request to answer the questions and return same. It is an easy means of gathering data especially when the respondents are not within the reach of the researcher. This method is very popular among researchers, public organizations and even governments.

The idea behind a questionnaire is to elicit written responses from the respondents on their opinions, beliefs and attitudes as regards issues under investigation.

There are three types of questionnaires. They are:

- Structured questionnaire
- Unstructured questionnaire
- Pictorial questionnaire

1.3.1 Structured questionnaire

By its nature, ready-made options are provided for questions that are arranged in sequence from which the respondents are to choose. This method is easy to generate responses that can be coded easily and analyzed statistically.

Good examples are questions on gender and literacy. E.g. what is your gender (sex) two boxes are then provided one for male and the other for female from which the respondents can make their choice. Another one can be can you read and write in any language? The answer could be yes or no. it can also be presented in Likert scale like “how would you assess the teaching quality of your research methodology lecturer? Options may range from very satisfactory, satisfactory, no opinion, unsatisfactory and very unsatisfactory.

1.3.2 Unstructured Questionnaire

This type of questionnaire is essentially made up of open-ended questions in which response is unstructured. Respondents are to respond in the way they like. Thus, the respondent has greater freedom in answering the questions in the way he likes. In this case, the researcher does not pre-determine the responses. The major drawback of this approach is that, it is difficult to analyse quantitatively.

1.3.3 Pictorial questionnaire

Choices to this type of questionnaire are presented in form of symbols, photographs and drawings. Respondents are to pick the choice(s) that represent their opinions from the various symbols, photographs and drawings.

1.3.4 Basics Principles of questionnaire

- The questions should be clear, short, polite, simple, and straight forward. The size of the questions should be kept to the minimum
- The entire questions should be organized in a coherent and logical sequence; moving from the simplest to the difficult questions.
- Technical and vague questions that may be subjected to different interpretations should be avoided in the questionnaire.
- If personal or intimate questions are to be asked in the questionnaire, it should come up towards the tail end of the questionnaire.
- Questions that are capable of affecting the sentiments of the respondents should be avoided in the questionnaire.
- Questions should be worded in a way that relate with some of the specific issues in the questionnaire.
- Pre-test can be conducted on the questionnaire. Your colleagues can help you to analyse the questions to see areas that should be improved before distributing the questionnaire.
- Investigator should try as much as possible to make provision for uncertainty. E.g. “don’t know” “no preference”

1.4 Strengths of Questionnaire

- It is cheaper even when the sample population is large and is widely spread geographically.
- It saves time. Unlike interview in which the researcher will have to spend hours with the respondents.
- Respondents in far places can also be reached through mail in the administration of questionnaire.
- Many people can be reached within a short time.
- It makes possible the anonymity of the respondents and respondents can respond to questions in the questionnaire without undue influence from the researcher
- Greater uniformity is ensured and it is easily amenable to quantitative analysis.
- Respondents have adequate time to give well thought out answers.
- Some respondents that are difficult to approach can be reached through questionnaire

1.5 Weaknesses of Questionnaire

- It can only be used when respondents are educated and cooperating, so it is difficult to capture the illiterate segment of the population.
- When the questionnaire is unstructured, it is difficult to codify and subject it to statistical analysis.
- Unlike the interview, the control over questionnaire may be lost once it is sent out.
- This approach may open room for ambiguous replies or omissions of replies to certain questions and interpretations of omissions are difficult.
- The method is perhaps, one of the slowest in data gathering.
- It lacks in-built flexibility because of the difficult in amending the approach once questionnaire has been sent out.

Self-Assessment Exercise

- What differentiates the structured and the unstructured questionnaire?
- List three things a researcher should consider in drawing up a questionnaire.
- State three strengths and weaknesses of questionnaire as instrument for data collection.

1.6 Summary

In the unit above, we have looked at questionnaire as instrument for data collection. Our analysis covers the concept of questionnaire administration, the principles underlining it usage as well as the strengths and weaknesses of this instrument of data collection.

1.7 References/Further Reading/Web Resources

Biereenu-Nnabugwu, M. (2010) Methodology of Political Inquiry, Issues and Techniques of Research Methods in Political Science. Enugu: Quintagon Publishers

Kerlinger, F.N. (1964). Foundations of Behavioural Research.New York: Holth, Rinehart and Winston, Inc.

Kothari, C. R. (2004). Research Methodology: Methods and Techniques (Second Edition). New Delhi: New Age International

1.8 Possible Answers to Self-Assessment Exercises.

1. In structured interview, ready-made options are provided for questions that are arranged in sequence from which the respondents are to choose. But in unstructured questionnaire, the questions are open-ended, and the respondent has greater freedom in answering the questions in the way he likes.

2. a. The questions should be clear, short, polite, simple, and straight-forward.
   b. The entire questions should be organized in a coherent and logical sequence; moving from the simplest to the difficult questions.
   c. Technical and vague questions that may be subjected to different interpretations should be avoided in the questionnaire.

3. Strengths:
   a. Greater uniformity is ensured and it is easily amenable to quantitative analysis.
   b. Respondents have adequate time to give well thought out answers.
   c. Some respondents that are difficult to approach can be reached through questionnaire

Weaknesses

a. It can only be used when respondents are educated and cooperating, so it is difficult to capture the illiterate segment of the population.

b. When the questionnaire is unstructured, it is difficult to codify and subject it to statistical analysis.

c. Unlike the interview, the control over questionnaire may be lost once it is sent out.

Unit 2 interview and Focus Group Discussion as Instruments for Data Collection

Unit structure

2.1 Introduction

Interview and focus group discussion are both methods of data gathering. Even though the two methods are similar, they are not the same. This unit teaches students the marked difference between these two methods of data collection**.**

2.2 Learning Outcomes

At the end of this unit, students should be able to:

- Identify the different types of interview methods.
- Discuss the principles governing the interview method of data gathering.
- Explain the strengths and weaknesses of both interview and focus group discussion

2.3 Interview Instrument

Interview as a method of data gathering, involves face-to-face, verbal communication between the investigator and his or her sample/population. This method gives the interviewer the opportunity to elicit information from the respondent and record same. Interview affords the investigator a rare privilege to have a deeper knowledge about issues being investigated.

According to Biereenu-Nnabugwu (2010) there are four types of interviews using size and types of questions as yardsticks. They are:

- Single or individual interview
- Group interview
- Structured interview
- Unstructured interview

2.3.1 Single interview

This type of interview is directed at one person or individual (respondent). This presupposes that one person is interviewed at a time. One of the strengths of this method is premised on the fact that, the respondent has some freedom which makes him feel free to express himself fully and objectively. It is also cheaper and less cumbersome when compared to grouped interview.

2.3.2 Group Interview

This method of interview is called group interview in the sense that it has to do with bringing persons with varied viewpoints together to address the same problem at a time. The main advantage of this method is that, in some instances, it tends to produce more balanced and useful information as participants can produce wide range of information on an issue. And the fact that persons that are knowledgeable on the issue(s) under investigation help the respondents to verify, recall or correct items of information that appear conflicting. The weakness of this method is predicated on the fact that, it is time consuming and it cost implication in terms of arranging it can be huge. Another noticeable weakness is that, respondents that are shy may be intimidated and dominated by the most outspoken ones, thereby; making the information gathered not representative of the entire group.

2.3.3 Structured or Formal Interview

As the name suggests, this method of interview involves arranging and organizing the questions in a substantially standardized and formalized manner. In the main, structured interviews lead to the imposition of definite format in the conduct of the interview. It has to do with asking uniform questions from the respondents and recording their answers in a similar sequence of arrangement during in a standardized form.

This method makes the analysis more straightforward. This is premised on the fact that the type of data often generated is amenable to conventional statistical tests and analysis. It is inclined to quantitative orientation. The major strength of this approach is that, is amenable to coding and numeric analysis, precise measurement and scientific

interpretation. One of the major snags is that quite a number of interviewers often resent structured questioning and some researches by their nature lend themselves to this approach as the only viable or acceptable basis for data gathering and interpretation.

2.3.4 Unstructured Interview

This type of interview is essentially informal and unstructured. Thus, the investigator has the liberty to adjust the questions. This is especially the case when structured interview may not be necessary or impossible to use. The information solicited for may necessitate variations in the structure of questions. The questions are often open-ended such that the interviewer is free to determine what question to ask. One key advantage of this method is that, it encourages freer expression particularly on the part of the respondent. Another major strength is that it encourages probing questions which help investigator to get better clarification on issues of ambiguity and more elaboration on the earlier response.
One of the major set-back of this method is seen in the fact that, inexperience researchers may find it difficult to grapple with as special skills are required to elicit information for research through this method.

2.3.5 Basic Principles of Interview

The Basic Principles for Interview are:

1. Identify the objectives

The investigator must as a matter of fact, identify the objectives of the interview before embarking on such exercise. It is necessary to do this but more importantly, it must be kept in focus in the course of the interview. Fundamentally, the objectives must align with the purpose of addressing the hypothesis or hypotheses.

2. The investigator must be conversant with Interview Techniques

It is a matter of necessity that an investigator must be familiar with interview tools and techniques. Such skills could be acquired through formal or informal training for an investigator and his/her research assistants. The essence of this is to make sure that similar standards and styles are employed, especially when more than one interviewer will be involved in the interview process and the interview is unstructured.

3. Prepare the Questions

The investigator will be more effective if he can internalize the questions, especially for the structured questions or at least adhere to them when asking the questions. If it is unstructured questions, the interviewer must make sure that he/she has a clear idea of the issues, topics or areas to be covered so as to meet the set objectives of the interview.

4. Create Rapport

The essence of interview is to create a good rapport between the investigator and the respondent before, during and after the interview session. Interview is a social event; therefore, the investigator must create a very conducive social atmosphere so as to get the best from the respondent. It is the interviewer that needs the respondent and not the other way round, therefore, the investigator must seek for the cooperation of the respondent and also ensure that necessary institutional formalities are obtained before embarking on the interview proper when/where the need arises.

5. Be Properly Dressed and be Polite

There is a wise saying that the way do dress will determine how you will be addressed. A researcher on the field to generate data must appear serious minded in the way he dresses and in his mannerism. He should neither looks gorgeous or shabby, he should look smart and probably, officious as the aim is not to intimidate respondent but to be decent in dress and manners.

6. Be Tactful

It is necessary for a researcher to be tactful so as to get the best from their respondents. Since it is the interviewer that needs the support of the respondents so as to get information on his/her research work, he should not irritate those who have agreed to grant him audience. He should be tactful enough to study the mood and make-up of the respondents and know how to relate with them and get the best from them during interview session.

7. Be Logical

The interviewer should organize his or her presentation in a logical manner. The way he or she ask questions must flow logically and coherently for the respondents to understand with minimal effort.

8. Be Intelligible

The interviewer must as a matter of fact, employs appropriate vocabularies, phrases and sentences, rather than confuse statements and intentions. He must be straightforward and avoid cumbersome or high-sounding words as such words can distract from the core issues.

9. Be a Good Listener

The interviewer must have ability to listen well as this will encourage the respondent to be willing to give information that will be very useful to the researcher. Listening attentively will help the interviewer to be able to detect vague and evasive answers and choose appropriate follow-up question(s) to address such.

10. Accurate Recording of Information

Data generated from interview should be recorded accurately. It is important that information is recorded during interview session or immediately after the interview. The researcher may not be able to record verbatim, but then, it should be detailed enough test hypothesis or hypotheses and for general analysis.

2.3.6 Strengths of Interview Instrument

The strengths of interview instrument for data collection include the following:

- **Its Coverage is Wider**

This instrument for data collection can be applied to wider portion or segment of the population. This instrument makes it possible for researcher to gather information from both literate and illiterate members of the population.

- **Amenable to Quantitative Analysis**

Data obtained from this method is amenable to quantitative analysis as such data can easily be formatted in a standardized manner and generalization from such study can be done with high degree of confidence and precision.

- ***It is More Flexible***

This method has a level of in-built flexibility. The researcher is at the liberty to conduct the interview in a way suitable to him provided it will

not jeopardize the quality of the outcome. Through this method, the researcher can as well possibly accommodate new or additional information that could emerge during the interview session.

- ***Offers a greater Depth***

Interview method provides the researcher with ample opportunity to gather in-depth information from the respondent. By probing further, the researcher can dig up more facts or hidden facts from the respondents.

Enhance Clarity

One of the major strengths of this technique is that it gives the researcher the privilege to seek for clarification and better understanding of issues under investigation.

2.3.7 Weaknesses of Interview Instrument

- ***it is time consuming and energy sapping***
  a lot of time and energy may be required to run around before one can successfully conduct a single interview.
- ***Difficulty in tracking down important personalities for interview***

Some important personalities that may be major players of the issues under investigation may be difficult to track down for interview. Some of them may be political office holders or still occupying important positions and as such, hedged around with security details and retinue of aids which make them almost inaccessible.

- ***It is expensive***

Interview as a tool for data gathering can be expensive. This is necessarily so because every respondent has to be reached personally. He is to personally interact with the respondents who at times may be far apart and when quite a number of people are to be interviewed, it may require hiring research assistants. All these make the exercise a very expensive one.

- ***It requires specific skills***

Planning and executing interviews require some level of skills and proficiency. If the skill is lacking, as it is not for all-comers, the quality of data gathered may be affected.

- ***Adverse effect of human factor***

Human attitudes at times could have adverse effect on interview process. For instance, the mood of the investigator and respondents may not be favourable to the exercise. It has also been observed that when different people conduct interviews, there could be variation or different responses are received. This affects the dependability of this instrument as a method for data gathering.

- ***Shifting opinion***

During interview session, the researcher only has a snapshot of the respondent's opinion or view. It has also been observed that people's opinion varies from time to time based on a number of reasons/issues. It could be because the respondent may not be given enough time to think about the issues and recollect what actually transpired and he/she would not like to claim ignorance. The respondent at time could also give wrong information if he/she feels threatened that his/her confidentiality may not be guaranteed.

Self-Assessment Exercises 1

1. Differentiate between structured and unstructured interview
2. Discuss the strengths and weaknesses of interview as a method of data collection

2.4 Focus Group Discussion

Focus group Discussion is similar to interview. It dwells on group values, preferences, beliefs, characteristics among others. The essence of the Focus Group Discussion (FGD) is to understand the characteristics, dynamism etc of the group within the context of the study. While interview is person to person, that is targeted at interviewing persons that have been selected for a study individually, FGD direct such interview to a small group of persons selected for the purpose of the study. Those to be selected for this exercise depend on the nature of the study. In FGD a small group of people that shared values, experience, and occupation are brought together for this purpose. They should be between 6-10 in a group, male apart, female apart; youth apart and adult apart. Questions are asked from the interview template by the researcher and members of the Focus group begin to take their turn in discussing same with the researcher recording their conversations if they obliged him/her to do so, or he may write them down if they are not comfortable being recorded. The beauty of this method of data collection is that, since they are together, they can help to corroborate one another, bring to the remembrance of some of the things some group members might

have forgotten. It helps to excavate information which one may not get through interview method. The major problem with this method is that, it may be difficult to gather the people together. Another snag is that, it is expensive.

Self-Assessment Exercises 2

1. Describe the essential elements of Focus Group Discussion (FGD).

2.5 Summary

This unit examines the two similar but distinct methods of data gathering, interview and focus group discussion. The different types of interviews, their pros and cons, and the requirements for an acceptable interview session are enumerated in the unit. The dividing line between interview and the focus group discussion is also stated.

2.6 References/further Reading/Web Resources

Good, W.J., and Hart, P. K. (1952) Methods in Social Research, New York: McGraw-Hill

Kerlinger, F.N. (1977) Foundation of Behavioural Researc, New York: Holt, Rinehart and Winston

Obasi, I. N. (1999). Research Methodology in Political Science, Enugu: Academic Publishers

Osuola, E.C. (1993) Introduction to Research Methodology. Onitsha: Africana-Fep Publishers Ltd.

Selltiz, C., et al (1974) Research Methods in Social Relations, London: Muthen and Co. Ltd.

2.6 Possible Answers to Self-Assignment Exercises 1

1. Structured interview entails arranging and organizing the questions in a substantially standardized and formalized manner. On the other hand, unstructured interview is largely informal, and the questions are often open-ended such that the interviewer is free to determine what question to ask.

2. Interview has the capacity to cover a wider audience. It is more flexible, as it gives room for follow-up questions. It also offers greater depth of interaction between the researcher and the respondent. However, it requires some special skills by the researcher to conduct.it is also expensive; and the results could be affected by human interferences.

Possible Answers to Self-Assignment Exercises 2

1. Focus Group Discussion dwells on group values, preferences, beliefs, characteristics among others. While interview is person to person, that is targeted at interviewing persons that have been selected for a study individually, FGD direct such interview to a small group of persons selected for the purpose of the study. The beauty of this method of data collection is that, since they are together, they can help to corroborate one another, bring to the remembrance of some of the things some group members might have forgotten.

Unit 3 Observation and Documentary

Unit structure

3.1 Introduction

Some of the important methods of data gathering that do not require statistics in their analysis are observation and documentary. This unit I discusses what these two methods entail.

3.2 Learning Outcomes

At the end of this unit, the student should be able to:

- discuss observation and documentary as two major sources of data collection.
- identify the various types of observation and documentary methods.
- discuss the strength and weaknesses of observation and documentary as data collection methods.

3.3 Observation

This is a situation-based method of data gathering. It is a straightforward way of collecting data on human behavior. Obaasi (1999:169) asserts that observation is "a purposefully planned and systematically executed act of watching or looking at the occurrence of events, activities and behavior which constitute the subject or focus of research or study" observation as a tool for data gathering is used in virtually all disciplines, most especially the biological sciences and other science-

based disciplines. The observation method is used both qualitatively and quantitatively in research to generate hypothesis, illuminate theories, establish what happens in various setting among others.

3.3.1 Types of Observation

There are essentially two types of observation;

- Participant observation
- Non-Participant observation

3.3.2 Participant observation

In this type of observation, the researcher or observer is a participant in what is happening i.e the object of observation. He/she participates in what is being observed.

The major strength of this method of data gathering is that, it allows for detailed and accurate description of the phenomenon. It helps to bring to the limelight some aspects of private behavior which would have eluded the observer if he/she was not a participant.

The weaknesses of this method however, hinges on the fact that, participant observer may easily be carried away in such a way that his emotional involvement may affect his sense of judgment with implications on the objectivity of the description of the observation.

3.3.3 Non-Participant Observation

The non-participant observer often assumes the status of a spectator or onlooker. This is so because he/she is not involved in the activity being watched. He has opportunity to watch cannot participate in the event being watched.

The main advantage of this approach of data gathering is seeing in the fact that, since the observer does not participate in the event, he cannot be emotionally involved, and as such, his description of the event should be objective and accurate.

The major drawback of the non-participant observation is that, the observer is only able to see what he is allowed to see, but then, what he sees may not actually be in tandem with the actual reality. This happen most especially when respondents are aware that they are being observed, they can feign what is not, thereby, deceiving the observer from having a true picture of the event.

3.3.4 Strengths of the observation method

- Since the data generated from this method depends entirely on what has been empirically observed, the element of human error is reduced to a significant extent.
- Some devices that can aid accuracy of the data gathering can be deployed. For instance, audiotapes, motion pictures among others.
- It is less expensive when compare with other methods of data gathering

3.3.5 Weaknesses of the observation method

- Data that can be collected through the observation method for research is limited.
- Some of the devices used in gathering data through observation like recorder, audiotapes, motion pictures etc. at time could be costly and difficult to maintain.
- This method is not amenable to re-check or cross-checking.
- This method can only capture the moment but says nothing about what has been and what will be.

3.3.6 Basic Principles of Observation instrument

- Before embarking on observation method as a tool for data gathering, it is necessary to first establish the aim of the research as this will help to eliminate lack of direction as carrying out the observation will be done in natural settings or field studies and not in the laboratory.
- Observer should make a list of the characteristics sought for.
- Observer should decide how the observation will be recorded before embarking on it.
- Observer should be as objective as possible in gathering and interpreting data from observation.
- Observer should avoid the use of inexperience and untrained research assistants in carrying out observation.

Self-Assessment Exercises 1

1. Differentiate between participant and non-participant observation.
2. Discuss the strengths and weaknesses of observation as a method of data gathering

3.4 Documentary

The term document simply means recorded or written materials. Nwana (1981:177) defines document "as any written material that was already in existence, which was produced for some other purposes other than the benefit of the investigator. The materials may be typed, printed or hand written. It can also be published or unpublished. Documents are indispensable source of data for empirical analysis of political phenomena. Obasi (1999) states that, documentary dominate the traditional political science research. Political scientists often make use of documentary data like statistical records of electoral results, national development plans, population census, budgets and budgetary performance among others.

3.4.1 Materials that can be categorized as documents include:

Published materials
Government gazettes
Unpublished materials
Periodicals/Journals
Statistical records
Conference papers
Seminar papers
Archival materials
Legal records etc.

3.4.2 Techniques of Document Reading include:

- Evaluate several books

The investigator should read and evaluate several books that deal with the topic under investigation. The researcher should start this exercise with the most recent books, select those that are authoritative and readable.

- Select the best books first

Select, read and digest the most important books on the topic under study before reading others.

- Be critical

While reading, the researcher should be critical to be able to distinguish between facts and mere opinions. Understand how evidence is used to support theories, interpretations and conclusion.

Self-Assessment Exercises 2

1. What do you understand by documentary research?
2. Discuss the techniques of documentary research.

3.5 Summary

This unit gives a vivid explanation on observation and documentary methods of data gathering, highlighting the types of observation, principles of observation, strengths as well as the weaknesses of observation and documentary research.

3.6 References/further/Web Resource/Web Resource

Biereenu-Nnabugwu, M. (2010) Methodology of Political Inquiry, Issues and Techniques of Research Methods in Political Science. Enugu: Quintagon Publishers.

Black, J. and Champion, D. (1976) Methods and Issues in Social Research, New York: John Willey and Son.

Good, W.J., and Hart, P. K. (1952) Methods in Social Research, New York: McGraw-Hill

3.7 Possible Answers to Self-Assessment Exercises 1

1. In participant observation, the researcher or observer is a participant in what is happening or being observed. But, in non-participant, the researcher is detached to the extent that he does not participate in what is being observed.

2. The strengths of observation:

- The element of human error is reduced; accuracy is guaranteed through deployment of devices; and, cost is reduced.

Weaknesses:

- Limited data through observation method; devices needed are costly to some researchers; does not offer opportunity to re-check or cross-check; and it is momentary because it cannot determine what has been and what will be.

3.8 Possible Answers to Self-Assessment Exercises 2

1. Documentary research is anchored on recorded or written materials, Published or unpublished materials, Government gazette, Periodicals/Journals or statistical records, among others.

2. Evaluation of materials; Selection of materials; and being critical of materials to use.

Unit 4 Issues of Validity and Reliability in Research

Unit structure

4.1 Introduction

This unit discusses issues of validity and reliability of measuring instruments in social science research.

4.2 Learning Outcomes

At the end of the unit, the student will be able to

- Explain how reliable and valid a research instrument is in research.
- Discuss measures to safeguard the reliability and validity of research instrument.

4.3 Validity of Measuring Instruments

The question is, in what ways can validity of an instrument (scale) for measurement be improved? And what are the various types of validity? These are the questions that will be addressed under this section. Goode and Hart (1952) posit that, a scale possesses validity when it actually measures what is claims to measure. One can extrapolate that a scale is not valid if it does not measure what it supposes to measure. Selltiz, et al states that the validity of a measuring instrument is a function of the extent to which differences in scores on such instrument is a reflection on the differences among individuals, groups or situation in the characteristics it seeks to measure.

4.3.1 Types of Validity

There are different types of validity. They are: content validity, construct validity, predictive validity and criterion-related validity.

Content Validity

Kerlinger (1977) sees content validity as the representativeness or sampling adequacy of the content of an instrument of measurement. The question is, does the content being measure represent the universe of content of the property?

Thus, content validity necessitates that the instrument for measurement is consist of a logical sampling of items that is presumed to reflect the characteristics to be measured and is in consonance with it in some consistent fashion.

Construct Validity

From theoretical perspective, when there is congruence between a variable under investigation and other variables, then there exists a construct validity of a measuring instrument. Black and Champion (1976) explicates that, construct validity relates a measuring instrument to the theoretical framework so as to determine whether the instrument for measurement is tied to the concepts and theoretical assumptions employed in the study. In a sense, the researcher devices an instrument in terms of how much the result obtained is in agreement with the theoretical formulation that undergirded its development. If the results are germane to the theoretical base and help in the elaboration of the theory, then one can say the test has construct validity.

Concurrent Validity

Concurrent validity is akin to predictive validity, the only difference is time factor. It is usually measured by the calculation of a correlation coefficient between the distribution of test scores and some concurrently criteria measure.

For instance, concurrent validity for a standardized test in Nigerian government and politics might be obtained by correlating a set of test scores on students with their present grades in Nigerian Government and politics. the significant factor in the two concepts is the fact that they are not interchangeable. The ability of the test to predict future events cannot be demonstrated by its correlation with a concurrent criterion measure

.

Predictive and Concurrent Validity

As the name goes it is predictive in the sense that, it is based on the prediction of what a behavior will be and the subsequent behavior eventually exhibited. It is the ability of an instrument to predict some

future events. One can obtain Predictive validity by computing the correlation coefficient between a distribution of test scores obtained before against a distribution of some later criterion measure.

The summary of the above can be seen in the table below:

Table 1

Type of Validity	Type of Criteria
Predictive	Correlation of present set of scores with asset of future events
Concurrent	Correlation of present scores with some other observation of present behavior
Content	Representativeness of items of some well-defined universe of content
Construct	Compatibility of results with some theoretically derived hypothetical model.

4.4 Reliability

Another major concept that is important in measurement is Reliability. This concept has been defined in various ways by scholars. For instance, Kerlinger (1973) sees reliability as a term that connotes dependability, stability and predictability of measuring instrument. Simply put, reliability is the consistency of a measurement. Constituency of measurement overtime is usually determined by test-retest reliability and consistency noticeable in two similar measurements which is often referred to as "parallel form" or split-half" reliability is different since the type of consistency they measure are not the same.

4.4.1 Types of Validity

Test-retest Reliability

Test-retest Reliability is predicated on the fact that, individuals maintain particular opinions, views, attitude over a reasonable length of time when certain conditions remain constant. So to find out whether a particular test of instrument is consistent, what the investigator needs to do is to conduct the test at two different times. It means to measure at two different times the same thing over a reasonable length of time, let's say two weeks, the results gotten from the two tests conducted at different interval are then compared and correlated. If the results between the first and the second show high coefficient of correlation, then the test is reliable.

Alternative Form Reliability

In this method, two different forms of test are administered to the same respondents at the same time. The instrument necessitates the inclusion of different items which can be measured equally. Thus, this method is obtained as stated before through the alternate parallel form method. The idea is to remove deliberate change of opinion, memory loss and bias. The resulted of the two different forms administered the same time are then correlated, if there is a high coefficient of correlation, then the tests are reliable.

Split-half Reliability

Here a measuring instrument is divided into two parts and administered just only once. In this method, two halves are administered the same time and then correlated to see if there is high degree of coefficient, if it is so, the test is reliable.

Item Discriminatory Analysis

The essence of this type of reliability is to focus on internal consistency of the instrument so as to spot any inconsistency. The method evaluates and ascertains the discriminatory capability of a measuring instrument. The items in an instrument are assessed in such a manner as to see whether they have power to discriminate in their measures.

Self-Assessment Exercises

1. Differentiate between Validity and Reliability of research instruments.
2. Explain two major types of validity.
3. Identify and discuss two main forms of reliability

4.5 Summary

This unit discusses the issue of validity and reliability of research interest. Both are essential elements if research findings must stand the test of time.

4.6 References/Further Reading/Web Resources

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4.7 Possible Answers to Self-Assessment Exercises

1. Validity suggests that a measuring instrument measures what it is intended to. Reliability connotes dependability of results from such measurements.
2. Content validity and Construct Validity
3. Test re-test reliability and Alternative Form reliability.

MODULE 5 STATISTICS IN POLITICAL SCIENCE RESEARCH

Unit 1 Basic Concepts in Statistics

CONTENTS

1.1 Introduction

The advent of behaviouralism has led to the application of scientific method in the study of Political Science. One of the outcomes of this development is the use of statistical tools in the collection, analysis and interpretation of data. Thus, in this unit, you will understand the meaning of statistics, methods of organisng and presenting data, how to prepare statistical table, group data into different distribution among others.

1.2 Learning Outcomes

At the end of this unit, students will be able to:

- Understand the meaning of statistics
- Explain the various types of descriptive statistics
- Describe tabulation and the various kinds of tabulation
- Understand the measures of dispersion

1.3 Meaning of Statistics

Kothari (2006) states that, Statistics serves as a tool in research design, data analysis and in drawing conclusions. Fundamentally, the science of statistics cannot be ignored by any researcher, even though he/she may not have occasion to use statistical methods in all their details and ramifications. The question is what is statistics? According to Singh (2006), the term statistics connotes three things, namely; numerical

facts, dealing with numerical facts (collecting, classifying, summarizing, analyzing and interpreting numerical facts) and lastly, summarizing figures of numerical facts such as percentage, averages, means, medians, modes, standard deviation etc. Osuagwu (2002) statistics is the science and practice of developing knowledge through the use of empirical data expressed in quantitative form. It is based on statistical theory which is a branch of applied mathematics. Thus, one can surmises that statistics is numerical facts, dealing with numerical facts and summarizing figures of numerical facts

.

Basically, the important statistical measures that are used to summarise the survey/research data are: (1) measures of central tendency or statistical averages; (2) measures of dispersion; (3) measures of asymmetry (skewness); (4) measures of relationship; and (5) other measures.

1.3.1 Basic Concepts in Statistics

1.3.2 Data

Data is a fact. In a broader sense, the term data connotes the evidence or facts for describing a group or a situation. However, in a particular sense it is usually refers to as numerical facts such as heights, weights, scores on achievement tests and intelligence test, etc.

1.3.3 Classification of Data

The bringing together of items with common characteristics is called classification. Classification according to Erricker, 1981:26) can be grouped into the following methods:

- Classification on the basis of time
- Classification on the basis of geography
- Classification on the basis of quality or attribute
- Classification on the basis of quantity

1.3.4 Tabular Presentation of Data

The arrangement of data in a small space for easy comprehension in labeled rows and columns is called tabulation. It brings to the limelight variations and possible trends in values of variables. With the aid of tables, space and money is conserved and unnecessary repetitions are eliminated; it enhances better understanding of data as a result of its logical arrangement; peculiar characteristics of data can easily be identified and this makes comparison of data a lot easier; and lastly, trends and variations in data can easily be identified.

1.3.5 Rules for Tabulation

Obasi (1999:180), (Obikeze, 1986:28-30; Erricker, 1981:29 &30; Afonja, 1975:37) identify the rules for tabulation to include the following;

- There should be clear communication of information in neat and concise form
- Materials should be properly classified
- Make a rough draft, giving consideration to the layout of the rows and columns, and to the final appearance of the table
- Give names to all columns and rows
- State all units of measurement
- Give the source of all materials used
- Place a note at the bottom of the table if any heading or figure needs further clarification.

Frequency Distribution

Frequency table is one effective way of organizing and summarizing data. In a frequency table, the variable of interest forms the basis for classification and entries are frequencies. There is class interval and class frequency. The interval chosen between one class and another class is class interval while the number of times and item appear in a class interval is called frequency. A relative frequency is expressed as a ratio of the total frequency while a cumulative frequency while a cumulative frequency helps one read directly the number or percentage of all the units falls below a given value.

In statistics, a data set is always presented in summary to ease its understanding, and enable further mathematical calculations or manipulations. This can be done in basically three ways:

1. The use of frequency distribution table.
2. The use of a pictorial or graphical summary.
3. Employing the summary statistics (descriptive statistics).

Let us use consider each of these with the given set of data below.
It is noteworthy that there are four measurements scale which are:

i. nominal: which is measured in categories;
ii. ordinal: measured in rank order;
iii. interval: this is a scale that is susceptible to mathematical calculation such as addition, multiplication, subtraction or division but used in measuring a group data set.

iv. ratio: it is a scale that can also be calculated mathematical like the interval but adaptable to both the discrete and continuous observation.

The measurement scale of an observation or data determines the type of central tendency to use or that is suitable (Eneanya, 2012).

EXAMPLE ONE

The following were the assumed ages of thirty aspirants for Lagos Island local government chairmanship election of the four political parties in Lagos, Nigeria without party identification.

From table 1 data set, the frequency distribution can be presented as discrete or continuous data (a discrete data takes only a whole number and does not take an integer of positive, negative or zero while a continuous data accommodates an integer (Esan and Okafor, 1995). Also, it can take the form of a group classification. Tables one and two show the examples of a discrete and group frequency distribution respectively

Table 1: Discrete Data Presentation

Age	**Tally**	**Frequency**
30	III	3
32	~~IIII~~ I	6
33	II	2
34	I	1
35	I	1
37	II	2
39	I	1
41	I	1
42	III	3
43	I	1
44	III	3
45	I	1
47	II	2
54	II	2
55	I	1
TOTAL		**30**

NOTE:

The Roman figure is used as a tally to mark the number of times an age appears on the data sheet.

Example one data is also formed. This is shown in figure one pie chart and figure two histogram.

Table 2: Discrete Data Presentation

Age	**Tally**	**Frequency**
30-35	~~IIII~~ ~~IIII~~ III	13
36-40	III	3
41-45	~~IIII~~ IIII	9
46-50	II	2
51-55	III	3
TOTAL		30

Example two. Table 3

The following were the assumed ages of thirty aspirants for the Lagos Island local government chairmanship election of four the identified political parties in Lagos, Nigeria.

PDP	ACN	SDP	ACA	UNPP
32	54	35	30	42
44	47	37	42	54
45	30	32	44	33
37	39	41	32	44
32	43	34	32	47
33	32	55	30	42

2. **Pictorial presentation**

The data in table three are presented in bar chart as shown in figure one below

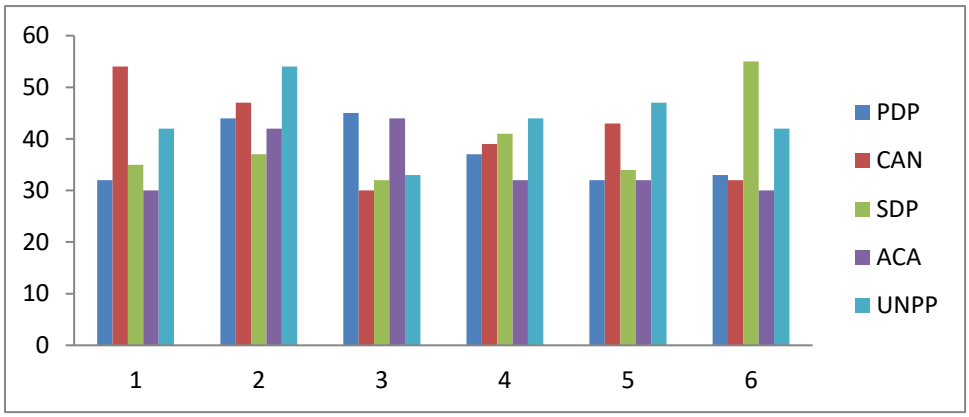
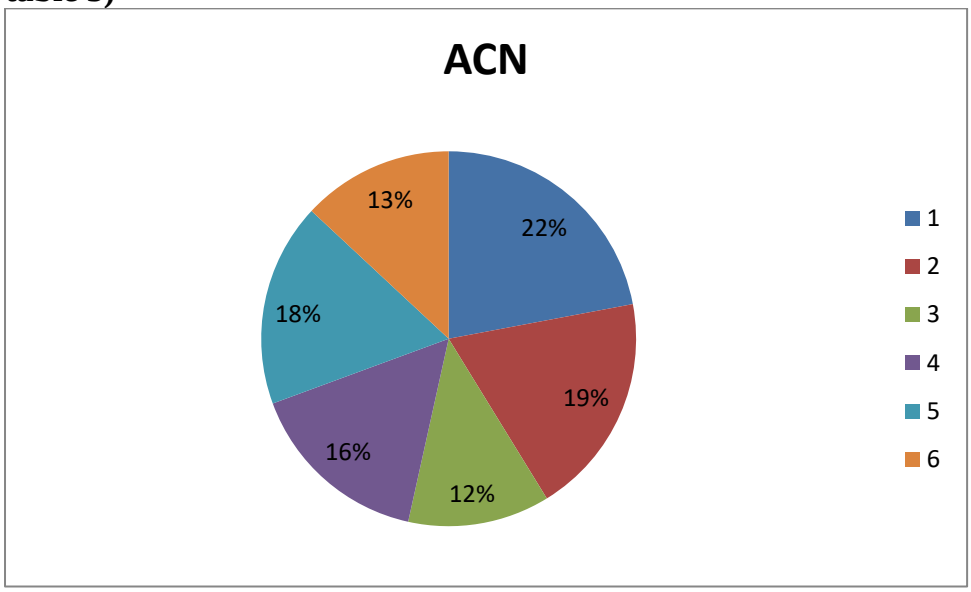
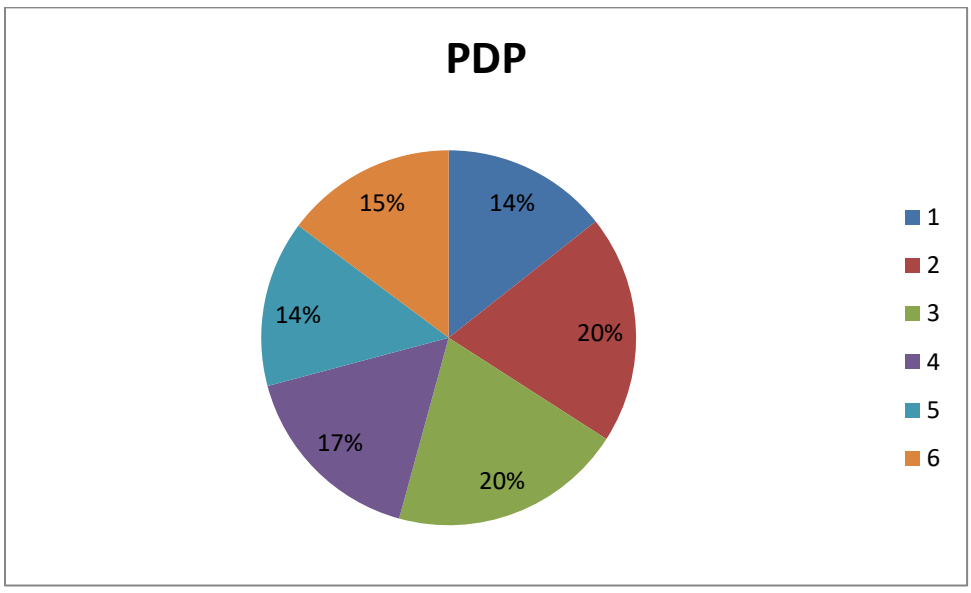


Figure 1: Bar chart showing the identified political party aspirants for Lagos Island local government chairmanship (as presented in table 3)

Figure 1: Pie charts showing the identified political party aspirants for Lagos Island local government chairmanship (as presented in table 3)





Using table three to calculate the pie charts, the formula is:
$(\alpha) = \ angle = \{$number in category (n)$\}$ X 360 where:
{Total number of observation(N)}

For example, computing for ACN (age 32) and PDP (age 54) respectively below, the angle is first known before calculating the percentage thus:

K = constant of proportionality
n = number of ages
N = sum of the ages

ACN:
32 X 360 $= 51.66^0$
223
Percentage = 51.66 X 100 = 14.35%
360
PDP:
54 X 360 $= 79.35^0$
245
Percentage = 79.35 X100 22.04%
360

3 Summary statistics

This is the capturing of the data in a summarized mathematical form. It is referred to as descriptive statistics because it helps to describe the characteristics of the data with a central representative value. The frequently used forms are: arithmetic mean, the median and mode. This is presented in the next study under the measurement of central tendency.

Exercises

(1) Consider the following height data of primary school pupils:
4 6 6 8 10 12

i. What type of data is this?
ii. Present this data in a frequency distribution table

(2) Present the data below in a bar and a pie charts pictorial form.
5 9 12 15 16 17 19 21 23 25

The Measure of the Central Tendency

The measurement of the central tendency is one of the prominent methods of determining the position of data characteristics. It helps to determine a figure that can approximately represent an entire set of either discrete or continuous data. The common statistical means of computing a measure of the center, especially in social sciences are the arithmetic means the median and the mode.

The mean

This is the average of a given data set. It is calculated by summing up the total number and then divided by the count of the data. The arithmetic mean is the best measure of the central tendency if there are no extreme values in the data set (Esan and Okafor, 1995).

For a discrete data of 2,4,8,10,12,14, the arithmetic mean would be determined thus:

$$X=\frac{2+4+8+10+12+14}{6}=\frac{50}{6}=8.3$$

For a continuous data, using table 3, the mean is determined thus:

$$\text{Mean } (PDP)=\frac{32+44+45+37+32+33}{6}=37.17$$

$$\text{Mean } (ACN)=\frac{54+47+30+39+43+32}{6}=40.83$$

$$\text{Mean } (SDP)=\frac{35+37+32+41+34+55}{6}=39$$

$$\text{Mean } (ACA)=\frac{30+42+44+32+32+30}{6}=35$$

$$\text{Mean } (UNPP)=\frac{42+54+33+44+47+42}{6}=43.67$$

The median

The median is the middle figure of a data set. In most cases, data are ordered or arranged in the ascending order, that is, from the smallest to the largest. The mid-number is easier to determine when the number of a data set is odd. For example, if the data are:

2,4,{8,}10,12.

The median is 8, separated from the two extreme even numbers of 2,4 and 10, 12.

However, when the observation is even, the median is arrived at by finding the average or mean of the two middle numbers. The median is better as the determined of the centre when the values of the data are

extreme, more particularly when in the low and high direction (Esan and Okafor, 1995).

The median is more useful as the representative of the central tendency when the data is to be measured on an ordinal or nominal scale.
For example, finding the median of the following number:

2,4,6,{8,10} 12, 14

The Median = $\frac{8+10}{2}$ = 9

The median is not frequently used in calculating central tendency because of the noted disadvantages.
For a continuous data, using table 3, it is computed thus:
PDP Median= $\frac{45+37}{2}$= 41

ACN Median= $\frac{30+39}{2}$= 34.50

SDP Median= $\frac{32+41}{2}$= 36.50

ACA Median= $\frac{44+32}{2}$= 38

UNPP Median= $\frac{33+44}{2}$= 38.5

The mode
The mode is the highest frequent number in the observation or data set. In other words, the number that appear most in the data-discrete or continuous. For example, the mode for this data below is 3

2,3,1,6,2,3,4,3,5,7

Because it appears three times. For a continuous data set from table two, 30-35 is the modal class with 13 counts. However, the mode for each political party from table three is computed thus:

PDP Mode= 45
ACN Mode= 54
SDP Mode= 55
ACA Mode= 44
UNPP Mode= 54

When a distribution or data set has two equal frequency figures, it is called bi-modal distribution. However, just like the median, the mode is seldomly used or encouraged in determining the central tendency

because of the limitation of not reflecting the score outside the modal score or frequency.

Exercises

(1) Using the data below, compute the mean, the median and the mode.

Monthly salary (#)	7000	8500	9000	9500	10000
Number of Staff	10	8	6	4	2

Measures of Dispersion

Measurement of dispersion is undertaken to know the extent of an item making up set or group of data scatter around the average or mean, which is the central tendency figure.

In other words, after a sample is used to determine the mean of a data set, the measurement of individual data variation from the mean is dispersion. It is worthy of note that it measures only variation or variability of a data set around descriptive statistics of arithmetic mean or average – the centre point of a data set.

The most often or common measurement of dispersion are

(1) The variance
(2) The standard deviation
(3) The range
(4) Quartile deviation.

We examine them with examples.

1. Variance

The variance is derived from the values of the means of a data or distribution. The mean or average value is squared to determine the variance. It is calculated for either the sample (S^2) or population (r^2) using this formula:

$$Q = \frac{1}{N} \frac{\sum(x^1-u)}{n}$$

$$S^2 = \frac{1}{n-1} \frac{\sum (X1\ X)}{n}$$

where:
X1 = individual number
X = mean
n = number of score or sample size

N = Population size
U = Population mean

Variance does not take a negative figure. It is small when the result is close to the mean, high when it spreads out around the mean, and is identical or not -varied when it is zero. In addition, it is calculated for both the discrete and group observation.

Standard Deviation
Standard deviation is the measure of the variability of the samples from or around the central tendency (mean or average) of an observation. The standard deviation is calculated from the variance by finding the square root of the variance. It reveals the average position of a value from the mean. When the standard deviation is high, it depicts that the values are far from the mean and vice-versa.

It is one of the most used measurements of dispersion or variability, especially when an observation is to be employed in determining the extent of a group data relationship or association. That is, it is essential for inferential statistics such as correlation and regression. It is computed using this formula.

Or $\sqrt{\sum \frac{(X-X)}{n}}$ where:
$\sum$ = Summation
X = Individual figures or number
X = mean
n = Sample size

Example: From table three, the standard deviation for each political party is computed thus:
PDP Deviation (X-Ž)
(32-37.17), (44-37.17), (45-37.17), (37-37.17), (32-37.17), (33-37.17)
$(-5.17)^{2,}$ $(6.83)^2$, $(7.83)^2$ $(-0.17)^2$, $(-5.17)^2$ $(-4.17)^2$
26.73+46.69+61.31+0.029+26.73+17.39 = 178.88
$Variance = \frac{178.88}{6}$= 29.91
Standard deviation = $\sqrt{29.91}$ = 5.46

ACN Standard Deviation (X-Ž)
(54-40.83), (47-40.83), (30-40.83), (39-40.83), (43-40.83), (32-40.83)
$(13.17)^{2,}$ $(6.17)^2$, $(-10.83)^2$ $(-1.83)^2$, $(2.17)^2$ $(-8.83)^2$
173.45+38.07+117.29+3.35+4.71+77.97 = 414.84
$Variance = \frac{414.84}{6}$= 69.14
Standard deviation = $\sqrt{69.14}$ = 8.32

SDP Deviation (X-Ž)
(35-39), (37-39), (32-39), (41-39), (34-39), (55-39)
$(-4)^{2,}$ $(-2)^2$, $(-7)^2$ $(2)^2$, $(-5)^2$ $(16)^2$
16+4+49+4+25+256= 354
$Variance = \frac{354}{6}$ = 59
Standard deviation = $\sqrt{59}$ = 7.68
ACA Deviation (X-Ž)
(30-35), (42-35), (44-35), (32-35), (32-35), (30-35)
$(-5)^{2,}$ $(7)^2$, $(9)^2$ $(-3)^2$, $(-3)^2$ $(-5)^2$
25+49+81+9+9+25= 201
$Variance = \frac{201}{6}$ = 33.5
Standard deviation = $\sqrt{33.5}$ = 5.79

UNPP Deviation (X-Ž)
(42-43.67), (54-43.67), (33-43.67), (44-43.67), (47-43.67), (42-43.67)
$(-1.67)^{2,}$ $(10.33)^2$, $(-10.67)^2$ $(0.33)^2$, $(3.33)^2$ $(-1.67)^2$
2.79+106.71+113.85+0.109+11.09+2.79= 237.309
$Variance = \frac{237.309}{6}$ = 39.55
Standard deviation = $\sqrt{39.55}$ = 6.29

The Range

It is the easiest means of measuring the level of dispersion. It is arrived at by subtracting the smallest value from the largest in a data or distribution.

For example, in a discrete data of 2,4,5,7,9, the range is 9-2 =7
Nine is the highest while two is the smallest and the difference between the two is seven.

Quartile Deviation

The quartile deviation is employed to know the dispersion of the data from the centre point (mean). As the name indicates (quartile), it divides the data value into quartile (25 percentile) making the middle point or quartile fifty (50), upper seventy-five (75) and the lower twenty-five (25). Then, the median of the observation is the quartile deviation – the middle or half of the range also known as the semi-interquartile range.

The degree to which the data on observation is far from the central or medium is determined in this regard as the quartile deviation. It is

statics believed to be the best measure for open-ended observations, though does not take cognizance of the extreme part of the observation. For example, if the following numbers are pol 101 students test scores:

4,7,8,10,11,13,15,19,21

Quartile Deviation formulae for grouped and ungrouped data.

Grouped

$Qd = \frac{Q3 - Q1}{2}$ where:

Qd = Quartile deviation
Q3 = Third quartile
Q1 = First quartile

Ungrouped

$Q1 = \frac{(n+1)}{4}$th item

$Q2 = \frac{(n+1)}{2}$th item

$Q3 = \frac{(n+1)}{4}$th item

It should be noted that the data are first arranged in ascending order before calculating the quartiles.

Exercises

(1) Using the data below, compute the variance, the standard deviation, the range and the quartile deviation.

Monthly salary (#)	7000	8500	9000	9500	10000
Number of Staff	10	8	6	4	2

Correlation and Regression Coefficient Analysis

Correlation and regression coefficients are common statistical instruments or tools used to determine the association between two variables – independent and dependent. “Correlation and regression are ‘twin’ subjects in the sense that one cannot discuss one without another, at least in passing reference to the other” (Okafor, 2014).

Correlation Coefficient Analysis

In the case of correlation, the degree of a linear relationship between the independent variable, for instance, the age of state electorates and the voting pattern of conservative or liberal political party (Y) as the dependent variable. The extent to which the age group (young adult or old adult) influence the choice of the party can be determined through

the correlation analysis. In other words, if a change in age (X) from year to adults into a change in the choice of a political part (Y) from a liberal to conservative, then there is a positive correlation between the two variables and where the reverse is the case, that is if the change in age from young to adulthood does not affect the choice of the preferred political party, then a negative correlation exist because X increase decrease or does not generate a change in Y. This indicates an opposite direction relationship between the two variables.
Furthermore, the correlation coefficient analysis shows only the land of relationship existing between two variables but not the causal relationship. The measuring values range between -1 and + 1 when the value is between less than 1 and 0, which implies a negative correlation while from 0.1 to 1 indicates a positive correlation. However, the strength is determined by the closeness of the value to -1 or + 1 and 0 is interpreted to mean no relationship.

The essence of a correlational test in social science is to enable the making of an informed policy arising from the understanding of a given relationship between the two variables. Hence, it helps in offering an empirical-solution based on an identified problem.

The two common formulas for correlation coefficient is:

1. Pearson's product-moment correlation coefficient
2. Spearman's Rank correlation coefficient.

Their formulas are stated below:

Pearson's formula

$$P = \frac{\sum (X - X)(Y - Y)}{\sqrt{\sum (X - X)^2 (Y - Y)^2}}$$

Spearman's formula

$$r^s = \frac{1\ 6\sum d^2}{n\ (n^2 - 1)}$$

Example: The following were the data of students' number of class attendance (X) and their percentage scores (Y) in Pol 101 course. The Pearson's correlation is arrived at as shown below.

Table 4:

X:	4	6	7	8	9	10
Y:	35	40	50	55	60	70

Descriptive Statistics

	Mean	Std. Deviation	N
X	7.3333	2.16025	6
Y	51.6667	12.90994	6

Correlations

		X	Y
X	Pearson Correlation	1	.980**
	Sig. (2-tailed)		.001
	N	6	6
Y	Pearson Correlation	.980**	1
	Sig. (2-tailed)	.001	
	N	6	6

**. Correlation is significant at the 0.01 level (2-tailed).

Regression Coefficient Analysis

While correlation only tests the association between two variables, the regression coefficient determines the 'causal' relationship between the independent (Y) and the dependent (X) variables. It reveals the extent of dependency between the two variables or how the independent variable (X) causes the dependent variable (Y) to behave or respond to a change in it. The magnitude of this change is, therefore determined by the independent variable. To ascertain this, a mathematical formula is employed as noted thus:

$Y = a + bx$

The formula is represented thus:
Y= the dependent variable value
X= the independent variable value
a = the intercept which is the value of Y when X = 0
b = the regression line slope indicating the degree or amount of change in Y for a unit change in Y.

the regression formula is a linear one and is plotted on a graph 0XX and Y to graphically determine the changes in Y as caused by Y. the extent of this relationship is seen in the scatter diagram after plotting which is tracked with a linear line. The value is also determined between 1 and +

1 and interpreted as a negatively or positively regression relationship when the outcome tilted towards -1 or + 1 respectively and 0 indicates a no regressional association as it applies to the correlational co-efficient.

Example: Using table four data, the regression is calculated thus:
Figure 3: Regression of Y

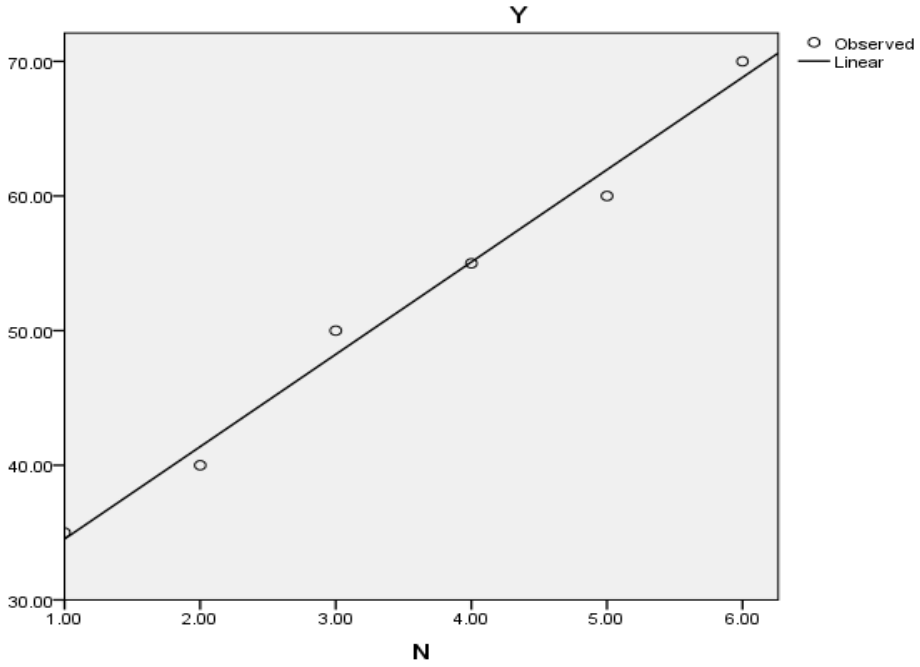
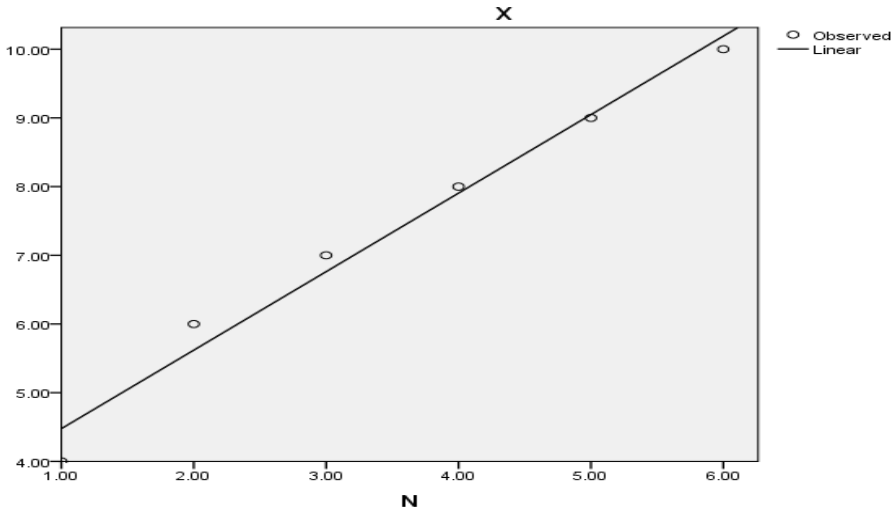


Figure 4: Regression of X



Model Summary and Parameter Estimates

Dependent Variable: X

Equation	Model Summary					Parameter Estimates	
	R Square	F	df1	df2	Sig.	Constant	b1
Linear	.980	192.000	1	4	.000	3.333	1.143

The independent variable is N.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change

Exercise

(1) Using the data below, compute the correlation and the regression coefficients.

Monthly salary (#) 7000 8500 9000 9500 10000
Number of Staff 10 8 6 4 2

(2) Consider the following height data of primary school pupils:
5 6 6 8 10 12

iii. What type of data is this?
iv. Present this data in a frequency distribution table

(3) Present the data below in a bar and a pie charts pictorial form.
5 9 12 15 16 17 19 21 23 25

5.4 References/further Reading/Web Resources

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