NATIONAL OPEN UNIVERSITY OF NIGERIA

SCHOOL OF ARTS AND SOCIAL SCIENCES

COURSE CODE: ENG 311

COURSE TITLE: RESEARCH METHODS

ENG311
RESEARCH METHODS

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Introduction

ENG311 is a three-credit course presented in six modules and 20 units. Emphasis is on the methods and procedures for conducting research in language and literature as students prepare for their final year research projects. The course is usually taught in the penultimate year that is at your 300 level of the BA English programme. The topics covered relate to the nature and functions of research, approaches to research, components of academic research, criteria for selecting research topics, statistical support, referencing, and so on.

Course Aim

The aim of this course is to introduce you to the fundamentals of research methods to equip you to be able to carry out independent research in language and literature. To achieve this, you will be:

- introduced to the basic ecology of research
- guided on how to select research topics
- introduced to basic statistics
- exposed you to different methods of referencing sources of research information.

Course Objectives

Apart from the specific objectives of each unit, the overall objectives of the course are presented below. Indeed, upon the successful completion of this course, you should be able to:

- discuss the nature of research
- state the different approaches to literary and linguistics research
- highlight the different sources of research topics
- explain the different components of academic research
- apply basic statistical tools to linguistics and literary research
- access and use different sources for research data
- prepare different types of references
- conduct credible research projects in language and literature.

Working through This Course

Success in this course will depend on how thoroughly you are able to study the units, consult the recommended texts and complete all the assignments. There are exercises provided for self-assessment. This course will take you about 16 weeks to complete.

The units have been presented in a way that you can have maximum interaction on each of them. You are advised to be particularly careful in the section on statistics. The choice of statistical models has been carefully chosen to introduce you to modern trends in the field.

Course Materials

The major materials you will find in this course text are:

- Course Guide
- Study Units
- Recommended Texts
- Assignment File
- Presentation Schedule

Study Units

The course units are presented in the following modules:

Module 1 The Nature of Research in Language and Literature

Unit 1 The Concept and Ecology of Research
Unit 2 Functions and Importance of Linguistic and Literary Research
Unit 3 Approaches to Research in Language and Literary Studies

Module 2 Sources of Research Topics and Nature of Research Problems

Unit 1 Source of Research Topics
Unit 2 The Nature of Research Problems and the Problems of Research in Nigeria

Module 3 Components of Academic Research

Unit 1 Research Background and Objectives
Unit 2 Hypotheses and Research Questions

Module 4 Research Design

Unit 1 Qualitative Research Designs
Unit 2 Methods of Qualitative Research
Unit 3 Quantitative Research Design Library/Desk Research
Unit 4 Survey and Experimental Designs

Textbooks and References

There is a list of references at the end of each unit. You are encouraged to search for these sources and consult them for further information. It will also be very profitable to consult other standard textbooks on each of the topics discussed.

Assessment

You have access to two types of assessment. These are the tutor-marked assignments and the end of semester examination. You will be expected to sit for an examination at the end of the course.

Tutor-Marked Assignments (TMA)

At the end of each unit, there is the TMA, which you will be expected to attempt, applying the information, knowledge and techniques you have acquired in the unit. As the University is now largely automated in its operations, the tutor-marked assignments are now done online and the grading immediate. This has largely helped in reducing the burden of slowness in accessing results by students. Make sure you keep up with the dates for submission of your TMAs as given to you on the University web site and your Study Centre. TMAs carry 30% of your final assessment.

Final Examination and Grading

The final examination carries 70% of your final grading score. Moreover, the examination is now conducted on the electronic platform by the University as noted above. Questions will be drawn from all areas of the course. You will be required to read the course material very well before the examination. You are also required to improve your computer skills for your own good.

Course Marking Scheme

The total score for the course is 100% - comprising 30% TMA's and 70% for the examination. It is advisable that you do all you can to pass both your TMAs and the examination to give you good standing in your final grade.

Course Overview and Presentation Schedule

Units	Title of Work	Weeks of Activity	Assessment End of Unit
	Course Guide	1	
	Module1 The Nature of Research in Language and Literature		
1	The Concept and Ecology of Research	1	
2	Functions and Importance of Linguistic and Literary Research	2	
3	Approaches to Research in Language and Literary Studies	3	
	Module 2 Sources of Research Topics and Nature of Research Problems		
1	Source of Research Topics	4	
2	The Nature of Research Problems and the Problems of Research in Nigeria	5	TMA 1
	Module 3 Components of Academic Research		
1	Components of Academic Research	6	
2	Quantitative Research	7	
3	Qualitative Research	8	
4	Literary/Desk Research	9	
5	Survey/Experimental Design	10	TMA 2

	Module 4 Research Design		
1	Introduction to Statistical	11	
2	Parametric Statistical Procedures	12	
3	Non-Parametric Statistical Procedures	13	TMA 3
	Module 5 Basic Statistical Tools for Linguistic and Literary Research		
1	Documentation and Referencing	15	
2	The Processes of Review Literature	16	TMA 4
	Revision/Examination	21-22	
	Total	**22**	

How to Get the Most from This Course

The units are meant to guide you just as a teacher would. You are therefore expected to take each unit very seriously. You should not neglect the exercises as they are meant to help you assess yourself as you study.

In each unit, you will identify a similar structure — introduction, objectives and the main content. The objectives present to you what to be achieved, while the introduction gives a short overview. It is in the main text that details of the topic are presented.

Facilitators/Tutors and Tutorials

You will be provided with tutors at your different Study Centres for tutorials on difficult areas of the course. The tutors will have contacts with you for specified periods. You will benefit maximally from your tutor by participating in the tutorials, completing your assignments in the Course Material and asking questions on difficult areas.

Summary

Skills in research are essential for success in any modern career that requires continuous improvement. Apart from the essentials provided for English language and literary studies, the course holds the key for excellence in all other courses you study as well as your future academic and professional pursuits. It is therefore crucial that you pay a great deal of attention to every aspect of this course.

Course Code ENG311
Course Title Introduction to Research Methods in Language and Literature

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MODULE 1 THE NATURE OF RESEARCH IN LANGUAGE AND LITERATURE

UNIT 1 THE CONCEPT OF RESEARCH AND ECOLOGY OF RESEARCH

CONTENTS

1.0 INTRODUCTION

The major difference between the developed and developing countries of the world is the ability of the developed countries to engage in systematic and conscious search for the improvement of the society. Experts from most developed parts of the world work on their social, economic, political, educational and other sectors in order to attain progress. This simply means that they engage in scientific research to improve their nations.

In this unit, we shall be learning what research means and the various processes we use in research. We shall attempt definition of research and examine the components of the various research processes. We shall examine the process of research starting with observation, theory, hypothesis, hypothesis testing, and so on. The main purpose is to point out succinctly, the way and manner a research is carried out.

2.0 OBJECTIVES

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

- define research and explain what it means
- state clearly the processes of conducting a research
- apply the processes in conducting your research.

3.0 MAIN CONTENT

3.1 The Concept of Research

Research is the systematic study of materials and sources in order to establish facts and reach new conclusions. The word *research* can better be understood when broken into two and hyphenated. That is, *re – search.* According to the Microsoft Encarta (2009), the *prefix re – means again, anew, backward* while the word *search* means to examine something thoroughly that is to *look into, over,* or *through something* carefully in order to find something. It also means to *discover* something by examination -to come to *know* or *find* something by examination. When both words are put together, we see research to mean the systematic process of collecting, analyzing and interpreting information concerning a subject matter. Methodology on the other hand is simply the way, procedure or system of carrying out the research. Thus, methodology encompasses the principles, philosophical underpinnings and rationale. Interestingly, Romberg's (1975) definition is in line with this view. According to him, the word research has as its stem "search," which means 'look for' with the prefix 're' which together means '*to look for again, more carefully, more exhaustively*.' It then means that research has to do with carefully searching out or looking for something in order to understand whatever one is examining.

It is important to point out here that the scientific method is what underlines the research process. The scientific method simply means the stepwise procedure adopted by scientists in solving problems. This step-by-step approach shall be discussed in the next unit. Taking all of the above together, it then means that for one to search effectively, one must follow a technique, procedure or process in the search. This now takes us to the research process.

3.2 The Research Process

The research process is simply the procedure or methodology that we adopt in our research. The process could either be an inductive process or a deductive process. An inductive process goes from the specific to the general while a deductive process goes from the general to the

specific. These two processes can be seen as the bottom up process and the top-down procedures.

The **hypothetico-deductive model** or **method**, popularised by Karl Popper is the most popular and most understood method of scientific inquiry. As the name implies, it begins by first formulating a hypothesis which could be tested, accepted or rejected by the result of the data, gathering of data, hypothesising an explanation for the observations, deducing or predicting a result while conducting the experiment or research. If the result confirms the prediction, the prediction is accepted but if not, the hypothesis is reformulated until the falsification is accepted or the hypothesis makes a prediction.

The research process starts with an observation, which the researcher tries to confirm through providing a hypothesis. The hypothesis is tested through the analysis of a research result. The result of the analysis is then used to build or construct a theory. From the theory that is built, a new hypothesis emerges to explain the concept. The researcher then juxtaposes the present hypothesis with the observation and makes a decision whether it explains it or not. If it does, it is left but if not, the procedure is undertaken again. The research cycle is used below to depict his process.

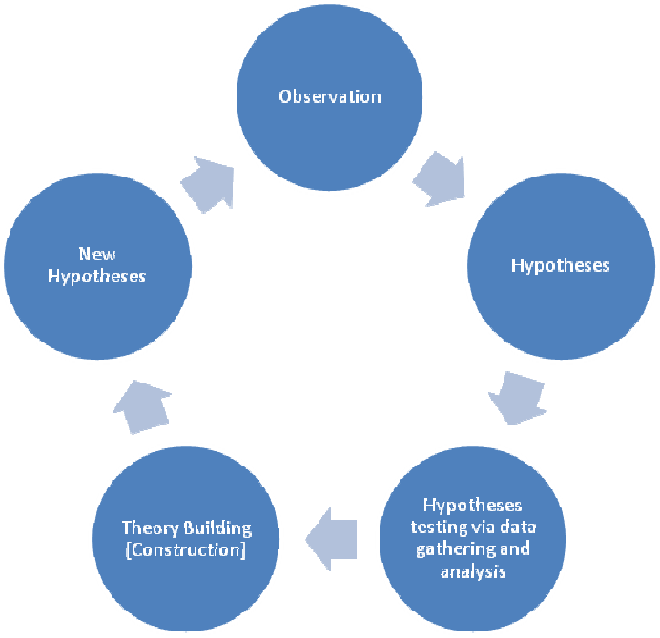

Diagram 1.1: The Research Process Cycle

3.3 Observation

The first research process is **observation**. Observation has to do with gaining knowledge through direct empirical and pragmatic encounter with the object. We observe things daily and the process gives clues to possible research problems and viable research ideas. For instance, it was told of how Newton developed the law of gravity by thinking about an apple and asking, "Why does the apple always fall perpendicularly to the ground and not upwards?" As a linguist, one might decide to investigate the reason why children born in middle class educated families acquire more sophisticated vocabulary than their counterparts in low class families; or even why females prefer to pursue careers that have to do with caring and speaking like nursing, law, human resources, mass communication, journalism and so forth while their male counterparts do not always do so. These are all products of observation. Once an individual is able to observe, questions are inevitably raised. For instance, in the Newton's case, "why did the apple not fall upwards?" It is in response to this question that we shall explore the next stage, which is the formulation of the hypotheses.

3.4 Hypothesis

A hypothesis, which has hypotheses as its plural form, is a prediction of the sequence of the result to be observed deriving down the manipulation of the independent and the dependent variable. Hypotheses are probable answers to the problems the researcher sets out to solve. According to Aboh and Obidigbo (1998: 9):

> 'A hypothesis is a testable prediction about the relationship between two or more events, characteristics or variables. It also consists of a specific potential explanation for the occurrence of an event. Therefore, an experimental hypothesis must:

- Potentially provide a relevant answer to the specific question
- Be stated as clearly and as simply as possible
- Be capable of being directly supported or rejected by the results of an experiment.'

Using Newton's example, one can state a hypothesis that, "apples will fall down perpendicularly" or state that "Apples will not fall down perpendicularly."

However, using an instance in linguistic research, one might say, "There will be no difference between males and females performance in an English Literature test" or "There will be a difference between the

performance of males and females in an English Literature test." The first example is a type of hypothesis called the **null hypothesis** while the second example is a type of hypothesis called the **alternate hypothesis**. Theses together are called **non-directional hypothesis**. They are called non-directional because they do not point towards a given direction in explaining their proposed outcome of a research. Another type of hypothesis is the **directional hypotheses**. For instance, a hypothesis like "males will perform better than females in an English Literature test" is stated in a directional form. This is called directional because it always points towards a given direction – males' better performance. Therefore, the statement of hypothesis is the second step or stage in a research process.

3.5 Hypothesis Testing

After the hypotheses have been formulated, the next stage is the testing of the hypotheses through field work. This stage is called **hypothesis testing stage** and this is usually done through analysis. Here, variables are manipulated. In order to effectively manipulate variables, the researcher randomly selects, assigns, treats, observes and measures the variables. For the purpose of clarification, "a variable refers to an event, behaviour, condition or characteristic that has two or more values. It equally refers to factors that can be varied such as age, gender, height, student, noise, colour etc." (Aboh & Obidigbo, 1998). For the purpose of this course, we shall examine three variables of interest: the independent, dependent and secondary variable. The independent variable (IV or X) is the variable that the experimenter manipulates. The dependent variable (DV or Y) is the variable that the experimenter observes the effect of the manipulation of the independent variable on. Hence the dependent variable is measurable. Secondary variables (SV) are variables which are extraneous and their function is to confound an experiment.

Using the example on performance of students in English Literature test, we can delineate the variables. The independent variable is the gender, which is either male or female. This is the variable that is manipulated. The dependent variable is the one that is measured which is academic performance while a secondary variable could be the individual's family background or IQ. Once these are effectively manipulated, the researcher comes up with a result and with the result; he either accepts or rejects the hypothesis.

3.6 Theory Construction and New Hypothesis

From the manipulation of the variables, the researcher constructs a theory. This might be in alignment with the first theory if the hypothesis

is accepted but if it is not, he will have o reconstruct it. For instance, if the null hypothesis is accepted, the researcher will be able to say unequivocally that there is actually "no difference between males and females performance in an English Literature test" while when it is accepted, the researcher might be able to come up with a theory that will take its premise from the fact that "there is a difference between males and females performance on an English Literature test"

New Hypothesis
Once the researcher gets through with constructing a theory on the effect of gender on performance in English Literature test, the new hypothesis now becomes the basis for the construction of a new theory.

4.0 CONCLUSION

In this unit, we have explained the concept of research as a systematic and scientific search for solutions to problems. We have also tried to explain the research process, which starts with observing, coming up with hypotheses, hypothesis testing, theory construction and the formulation of new hypotheses based on the research conclusion.

SELF-ASSESSMENT EXERCISE

1. Explain what you understand by research.
2. Mention steps involved in a research process.

5.0 SUMMARY

In this unit, you have learnt the:

- the definition and explanation of research
- the process of conducting a research
- how to arrive at a new theory from the research process.

6.0 TUTOR-MARKED ASSIGNMENT

1. What do you understand by research?
2. Explain the difference between hypothesis and hypothesis testing.
3. Choose a research topic and outline the process you will apply in conducting it.

7.0 REFERENCES/FURTHER READING

Creswell, J. W. (1994). *Research Design: Qualitative and Quantitative Approaches.* Thousand Oaks, CA: Sage.

Egbule, J. F. (2004). *Practical Guide to a Successful Project or Thesis Writing and Defense.* Owerri. Whyte and Whyte Publishers.

Malim, T. & Birch, A. (1992). "Research Methods." In T. Malim., A. Birch, & A., Wadeley. (Eds.), *Perspectives in Psychology*. London: Macmillan.

Microsoft Encarta. (2009). "Research." Microsoft® Student 2008 [DVD]. Redmond, WA: Microsoft Corporation, 2007.

Mouton, J. & Marais, H. C. (1996). *Basic Concepts in the Methodology of the Social Sciences.* Pretoria: HSRC Publishers. Newbury Park, CA Sage.

UNIT 2 Functions and Importance of Linguistic and Literary Research

CONTENTS

1.0 INTRODUCTION

Linguistic and literary research plays a major role in understanding, explaining, controlling and predicting human behaviour with regard to language and literary appreciation. Since structured and organised language is the major distinguishing factor between humans and the lower animals, it is important to understand the function of the process of searching for new knowledge in different aspects of language and communication.

The main purpose of exploring this is to equip you with the requirements for a research. There is also the need to expose you to the importance of engaging in literary and linguistic research.

2.0 OBJECTIVES

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

- state the functions of linguistic and literary research
- state the importance or benefits of linguistic and literary research
- highlight the qualities of a good researcher
- discuss qualities of a good research.

3.0 MAIN CONTENT

3.1 Functions of Linguistic and Literary Research

Linguistic and literary research exists to achieve the following.

1. To find out general principles about language, literature and communication
2. To assist in deductive and inductive process of data collection, analysis and interpretation
3. To advance human development through language
4. To solve problems associated with language
5. To examine information in the broad areas of human communication
6. To understand the present and predict the future of human language behaviour
7. To gather information for project writing, journal articles, textbooks, workshop and conference papers
8. To create knowledge where it does not presently exist
9. To instigate discoveries in the areas of focus
10. To advance knowledge

3.2 Importance or Benefits of Linguistic Research

1. **Community Development:** Research is important in community development. As mentioned earlier, the major difference between the developed and developing countries is that the developed countries are constantly embarking on research and development in order for their economies to further develop while it is not the same with developing countries. This then means that if developing countries want to move from the stage they are in to the next stage, they must put more efforts in research. For instance, a great deal of developments in computers and telecommunication are associated with discoveries in linguistics.

2. **Improvement of knowledge:** The present knowledge in linguistic and literary studies is very far removed from what it used to be in the past. We have advanced in knowledge through research. There have been discoveries relating to language universals.

3. **Planning and development:** Research also helps us in planning and development. As a nation, we cannot advance if researchers do not assiduously engage in the process of finding answers to certain questions needed in national planning and development.

In the current wave of globalisation, research in language needs is very useful.

4. **Advancement of field:** As pointed out earlier, the field of linguistic and literary research cannot go any further if research efforts are not intensified. However, if we want to experience a swift acclivity in the development of the field, then, research efforts must be intensified.

5. **Decision-making:** Research is important because the result from it enables people make informed decisions in every area of endeavor, be it in government or in academics. We are constantly in need of what medium of communication would be required for international relations.

3.3 Qualities of a Good Researcher

1. **Objectivity:** A good researcher must be objective. He must have the goal of the research always in mind and must not try to cut ends in order to achieve the research objectives.

2. **Flexibility:** A good researcher must be flexible and not rigid. At times, the hypothesis might need changing during the process of the research or the participants might need to be sampled differently. A good researcher must be very flexible to adapt to changes in the research field.

3. **Painstaking:** A good researcher must be able to take his/her time in conducting research. Research is not a something that is done in haste. Therefore, a good researcher must be patient both with the participants and with the research process.

4. **Imaginative:** This is a major quality of a good researcher. He must be able to create the research process and outcome in his/her mind before embarking on it. He must also be able to think out germane ways of solving problems.

5. **Sincerity:** A good researcher must abide by the principle of integrity and must uphold the ethical principles guiding research. He must report the research findings truthfully and must not manipulate data in an untoward manner.

3.4 Qualities of a Good Research

1. **Operationism:** Operationism simply means labelling variables. The researcher must be able to label the independent, dependent

and secondary variables appropriately. Not only that, the research procedure must be made clear. In addition, every term used in the research must be explained. Precision, related to operational definition of terms is used in research. The definition of operationism will suffice to drive home the point. Stanovich's (1989, p.39) defines it thus: "operationism is simply the idea that concepts in scientific theory must in some way be grounded in, or linked to, observable events that can be measured. Linking the concept to an observable event is an operational definition of the concept and makes the concept public. The operational definition removes the concept from the feelings and intuitions of a particular individual and allows it to be tested by anyone who can carry out the measurable operations."

2. **Empirical Observation and Evidence:** This is one of the most important qualities of a good research. This is because one of the basic characteristics of science is that that of relying on empirical observation but this must be done systematically. Mere observation as it were cannot get us anything in science. However, as scientists, our observation if structured should be able to reveal something about the underlying nature of the object we are studying and empirical observation leads to testability. Hence, one of the characteristics of research is that it must be based on empirical observation and evidence.

3. **Testability:** This means that every research must be testable for it to be regarded as a good research.

4. **Parsimony:** Parsimony and precision are two things that guide scientific research and make researches robust. Parsimony simply implies that ideas are not to be organised loosely. It means that the fewer the statement, the better the theory principle of occamism must be applied in research. Hence, the researcher should not make the research too wordy so that people will not miss the point.

5. **Scientific Basis:** Every research must have a scientific basis for it to be good. There must be clearly stated procedures with definite pathways of expected results.

6. **Being Systematic:** To be systematic, the research must follow a definite procedure such that any other researcher following the same approach would arrive at the results. This characteristic makes research a process of creating knowledge.

7. **Falsifiability:** According to Karl Popper, (1963, cited by Hergenhahn, 1986), "what distinguishes a scientific theory from an unscientific one is the principle of *refutability*." This simply means that no research is set on concrete. One researcher might come up with a discovery which another researcher refutes or falsifies years later. This has been the tradition in scientific advancement.

8. **Ethical Principles:** A good research must follow the ethical principles outlined by the discipline or by anybody or agency that sees to the conduct of researches. This implies that the researcher, before he engages in any research, must try as much as possible to protect the participants from harm, obtain the consent of the participants, debrief the participants, ensure confidentiality and that the participants are not deceived.

4.0 CONCLUSION

In this unit, we have been able to state the functions of Linguistic and Literary research. We have also explained the importance or benefits of Linguistic research and at the same time, the qualities of a good researcher and those of a good research. These are basic facts aimed at equipping the students with the benefits of engaging in research, the attitude they should possess as they go into the interesting field of research.

SELF-ASSESSMENT EXERCISE

1. Explain qualities of a good researcher.
2. What are the components of a good research?

5.0 SUMMARY

In this unit, you have learnt the following the

- functions of linguistic and literary research
- importance or benefits of linguistic research
- qualities of a good researcher
- qualities of a good research.

6.0 TUTOR-MARKED ASSIGNMENT

1. List and explain five functions of linguistic and literary research.
2. Describe four qualities of a good researcher.
3. Explain the following:

a) Operationism
b) Empiricism
c) Ethical principles

7.0 REFERENCES/FURTHER READING

Hergenhahn, B. R. (1986). *An Introduction to the History of Psychology.* California: Wadswarth Publishing Company.

Mouton, J. & Marais, H. C. (1996). *Basic Concepts in the Methodology of the Social Sciences.* Pretoria: HSRC Publishers. Newbury Park, CA Sage.

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UNIT 3 APPROACHES TO RESEARCH IN ENGLISH AND LITERARY STUDIES

CONTENTS

1.0 INTRODUCTION

The ability to identify and appreciate the particular approach to follow in conducting a research is crucial in the selection of appropriate methods and steps to follow for successful research endeavours.

The main purpose of exposing you to a variety of approaches is to equip you with the skill to make informed decisions regarding the quality of research procedures.

2.0 OBJECTIVES

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

- state the various approaches to research in Linguistic and Literary studies
- explain the various approaches
- apply the various approaches to linguistic and literary research.

3.0 MAIN CONTENT

3.1 Approaches to Research in English and Literary Studies

3.1.1 Survey

The survey research method is an approach that enables the researcher gather information or data from a large group of population. Survey research procedure can be established and achieved through two major means. The first is the **interview method** while the second is the **questionnaire method**. These are means by which the researcher asks questions about the beliefs, behaviours and attitudes of the respondents with the aim to succinctly describe the characteristics of the respondents and to generalise via extrapolation, such characteristics to the entire population. The design has the advantage of large sample and variable measurement and robust generalisability. The survey method is limited by its inability to measure cause-effect, relationships. In addition, the researcher is unable to effectively control secondary variables.

There are basically two major types of survey research: **cross sectional** and **longitudinal survey**. The longitudinal survey also has the trend study, the cohort study and the panel studies under it. A cross-sectional survey is a survey method used to gather “one off" information from a population. It is used to gather information from a large pool of participants only once. For instance, if a researcher is interested in investigating students’ perception of teaching methods, the first process is to construct a questionnaire that measures the demographic variables of the participants and captures the perception of teaching methods. Secondly, the researcher uses a simple random sampling method to administer the questionnaire to a pool of targeted students. One questionnaire is administered to one person at a time. In contrast, in the longitudinal method, the questionnaire is not administered only once but over a period. In this regard, the researcher might decide to analyze the yearly perception of teaching methods by students. This allows for comparison over time.

In trend studies, the researcher collects data over a long period from the same population but not the same sample cluster. This could be undertaken to show a trend in the perception of teaching methods overtime. In panel studies, the researcher studies a particular group of participants’ overtime. There is the need to succinctly distinguish between panel and trend design. Panel design studies the same group of participants over a period of time while trend studies uses the same group but partitions it into sections or clusters and studies them cluster by cluster over a period of time. That is, trend focuses on the same

population but not on the same people while panel focuses on the same population and the same people.

3.2 Historical Research

Historical research focuses on examining the contribution of an individual or community's previous contribution overtime. This is done through examining historical documents, through verbal interview or other sources. This is aimed at presently reenacting what had happened in the past. This method is usually used by historian to gather information from principal, original or primary sources in order to recount or reenact past events.). There are six steps usually used in the process of conducting historical research:

1. Recognising a historical problem or identifying a need for certain historical knowledge.
2. Gathering as much relevant information about the problem or topic as possible.
3. Forming of hypotheses that tentatively explain relationships between historical factors.
4. Rigorous collection and organization of evidence (data), and the verification of the authenticity and veracity of information and its sources.
5. Selection, organisation, and analysis of the most pertinent collected evidence, and the drawing of conclusions.
6. Recording of conclusions in a meaningful narrative.

However, with regard to this method certain questions are raised concerning the source of the information, the credibility of the information, how it was analyzed and so forth. Historical research attempts to examine the past and this is done through a critical and in-depth analysis of historical information. It could be done either qualitatively or quantitatively. For instance, a research on the effect of the Nigerian civil war on the language development of eastern Nigerians is a type of research under this method.

3.3 Case Studies

Case study has to do with the systematic study of an individual, group or a particular situation. There is usually an in-depth study of single events or individuals. The case study method more often than not, uses the longitudinal method of data collection when dealing with individuals or events. Case studies can be used to create new theories or to test hypothesis. However, a caveat with regard to the use of case studies is that the result should not be generalised to cases not similar to the studied case. Case study methods could be explanatory, exploratory or

descriptive. Case Study can be defined as an empirical enquiry that investigates a contemporary phenomenon within its real-life context; when the boundaries between phenomenon and contexts are not clearly evident; and in which multiple sources of evidences are used. The case study method is advantageous in that it studies a small data set, uses real life cases and is at times the only possible research method that could be applied in some researches. However, it has the disadvantage of reliability of findings, subjectivity, methodological and validity issues. The case study method follows the following steps: formulation of a theory, selection of cases, design and pilot research questions, the case is studied for about four times, the data are analysed, the cases written, a cross case analysis is embarked on, conclusions are drawn and the theory is modified. However, Soy (1997) follows a different but somewhat similar procedure. He suggested a method, which involves six steps.

1. Determine and define the research questions
2. Select the cases and determine data gathering and analysis techniques
3. Prepare to collect the data
4. Collect data in the field
5. Evaluate and analyze the data
6. Prepare the report

It is possible to study the language behaviour of selected individuals or groups or the literary style of particular authors.

3.3 Experimental Studies

The experimental research method is a research method that is used to establish cause-effect relationship among variables. The experimental study involves the manipulation of variables. That is, the manipulation of the independent variable, examination of the dependent variable while holding other variables, which can act as confounding variables constant. Hewstone, Fincham & Foster (2005) views it as a research method in which one or more independent variables are systematically manipulated and all other potentially influential variables are controlled (i.e. kept constant) in order to assess the impact of the manipulated (independent) variables on relevant outcome (dependent) variables. On the other hand, Smith, Nolen-Hoeksema, Fredrickson, Loftus, Bem, and Maren (2003) noted that experiments provide the strongest test of hypotheses about cause and effect. The investigator carefully controls conditions – often in a laboratory – and takes measurements in order to discover the causal relationship among variables. In Aboh's (2004) submission, he noted that experiments are organized to study behavior through the manipulation of an independent variable, the control of as

many other variables as possible; and the measurement of the dependent variable. Hence, the experiments involve mainly the manipulation of variables. There are majorly three kinds of experiment. They are:

a. Laboratory experiment
b. Field experiment
c. Natural experiment

A laboratory experiment is conducted in a well controlled environment (Malim & Birch, 1992). It is mostly used in psycholinguistic experiments. A field experiment as the name implies is carried out in the field; that is, the real world. Here, the experimenter does not manipulate the independent variable but takes into account in the design of the study (experiment), the variations that will occur naturally (Aboh, 2004). In some circumstances, researchers can take advantage of a natural situation in order to carry out an investigation. This is mostly done in circumstances which they cannot themselves manipulate. Hence it is done in a natural setting for the participants. Field experiments are common in Sociolinguistics.

Why Experiment?

The truth is: we all experiment. The ethnographers, anthropologists, mass communicators, linguists, sociologists and other social and natural sciences experiment in their quest to search closely, to find out things; There are various reasons why researchers prefer experimental methods to other methods. **Experiments are often used when:**

a) there is need to control variables;
b) the experimental process is “manipulable”;
c) the independent variable or other known variables are the only variable factors.;
d) the effect of the manipulation of variable is observable;
e) we want to base knowledge on scientific and empirical evidence;
f) we want to correctly interpret scientific findings;
g) there is need for inferences to be made statistically ;
h) we want to further raise our confidence level with regards to our result;
i) to identify general principles that seem to be true for most people most of the time;
j) To show the degree of association or relation between two or more variables;

The basic steps in conducting an experiment are:

1. Formulation of a hypothesis
2. Selection of variables
3. Assignment of the variables into conditions
4. Treatment (manipulation) of the independent variable to observe its effect on the dependent variable
5. Control of other contrary variables (this allows researchers make causal inference that the independent variable caused the observed changes in the dependent variable.
6. Observation of the dependent variable
7. Measurement of variables
8. Drawing conclusions and relationships between variables

3.4 Ex-Post Facto Research

Ex post facto is the Latin expression for *after the fact* or for what is done afterwards. In *ex post facto* research, the event has already occurred. This means that it is a research method used to investigate events retroactively. However, it can also be used to study events prospectively hence the two major types of ex post facto research being prospective and retrospective methods. As their names imply, retrospective *ex post facto* research is a research that is done in order to trace the preceding facts from a naturally occurring groups. Thus, respondents or participants are studied after the events have occurred. The retrospective type is engaged in order to study the people's past. An instance will suffice to drive home the point. A study to determine the effect of the Nigeria War on the Linguistic Development of children born in Eastern Nigeria would suffice as an *ex-post facto* research.

3.5 Action Research

Action research is a type of research meant to find a solution to a problem or challenge. For instance, one can investigate the falling rate of students' registration for English major. This type of research is either commissioned or gone into by someone for problem solving. The only challenge with action research is that it is situation specific and as a result, generalization becomes a challenge.

SELF-ASSESSMENT EXERCISE

1. Describe three approaches to linguistic and literary research.
2. Explain the survey method of research.

4.0 CONCLUSION

In this unit, we have been able to describe the major approaches to Linguistic and Literary research. These approaches are flexible approaches and application may differ depending on the researcher's aim and orientation. However, the basic way they are approached has been described.

5.0 SUMMARY

In this unit, you have learnt:

- the various approaches to research in linguistic and literary studies
- how to apply the various approaches to linguistic and literary research.

6.0 TUTOR-MARKED ASSIGNMENT

1. List and explain four approaches to linguistic and literary research.
2. Differentiate between survey research methods and the *ex-post facto* research method pointing out their advantages and disadvantages.
3. Explain the steps in carrying out an experiment.

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MODULE 2 SOURCES OF RESEARCH TOPICS AND RESEARCH PROBLEMS

UNIT 1 SOURCES OF RESEARCH TOPICS

CONTENTS

1.0 INTRODUCTION

The major challenge faced by students stems from the fact that most times, they receive topics from their supervisors or other senior faculty members. This more often than not put them in a fix and they are not able to go further in their research work; this is unacceptable. This is not to undermine the benefit of having to always go back to the person who assigned the topic for clarification on how to go about the study. But, what is the benefit of such clarifications in putting the student through today for the student to come back the next day when the student could have been given the liberty to look for and come up with a topic which he/she can own.

Hence, in this unit, we shall be examining the sources of research topics and characteristics of a good research topic this will enable the student go out into the field to search for viable topic and to know the characteristics of a good research topic so as to be able to distinguish a bad topic from a good one.

2.0 OBJECTIVES

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

- state the sources of research topics
- distinguish between primary and secondary sources
- state the characteristics of a good research topic.

3.0 MAIN CONTENT

3.1 Sources of Research Topics

We have two major sources of research topics. These are discussed below.

3.1.1 Primary Sources

Primary sources of research topics include library, databases, and research centers. The major source of information for research is the library. This is where information is indexed. In the library, the linguistic researcher is exposed to various information concerning his/her research through careful and concerted searches of journals, abstracts and research indexes. Among the primary source of research information or topic to be discussed herein are the following.

a) **Library catalogue of thesis:** Most universities now run an online or off line catalogue of theses. A catalogue of thesis is like the manual catalogue but the only difference is that the manual catalogue contains indexed books and so on while the catalogue of thesis contains only thesis. In addition to theses are abstracts and electronic databases, which are mostly on-line information sources, which enable the researcher source titles summaries of studies. Most universities like the University of Alberta now solicit for e - thesis submission from graduate of other universities.

b) **Microfilms:** A microfilm is a film on which printed materials are photographed and compressed at a very reduced size for storage purposes. This produced miniature documents, which run to thousands of pages. For instance, the University Microfilm International has more than 2.2 billion paged images, which contains more than 500 years of scholarly information some of which are doctoral dissertation, indexes and abstracts. Recently, ***ProQuest*** has been launched as an online source of microfilmed information and digitalised microfilm device.

c) **Research Centres:** Research centers are operated by either individuals or corporate organisations. These research centres have different areas of focus and each area of focus has many researchers conducted under it. What the researcher does is simply to gather information pertaining to a particular area and uses the information to proceed on his/her research. In addition, most of these research centers have an index or catalogue of researches they have done in a particular area and these are kept for researcher to know what has been done, what is left undone and what could be done. For instance, a research center, which focuses on oral history or language acquisition, will have information on their thematic areas.

3.2 Secondary Sources

Secondary sources are informal sources of information acquisition. These include the following.

a) **Personal experiences, ideas and interest:** The researcher's personal experiences, personal ideas and interest can be a rich source of information and point of departure in language and linguistic research. Here, the researcher does an introspective evaluation of what he/she has seen in linguistic and literary studies and how he/she thinks it could be done and devices means to go into the field to study these. Most people find this rational experiential aspect to be a very good point of departure in research. It is important to note that almost all researches stem from this perspective because for one to engage in any form of study one must have rationally thought about it first. A researcher may have observed the persistent error in the use of the tension. These errors will trigger some interest to conduct research.

b) **Pressing demands in an area:** The pressing demand in an area is another rich source of acquiring information for a research topic and subsequent project writing. A cursory look at the demands in linguistic and literary studies in Nigeria will bring to the fore a plethora of demands that needs to be supplied in terms of demands that needs to be supplied in terms of literature, practical work and so forth. For instance, one can look at the demand for an appropriate teaching method of spoken English and then decide to make his/her research efforts to focus on that area to supply the information needed.

c) **Need to fill up gap:** There is always a need to fill a gap in literature and in practice. So, a linguistic researcher might engage

in a research just to fill a gap in an area. It is possible to embark on research to establish characteristics of Nigerian English, in line with other national varieties of the language.

d) **Previous researches:** The examination of previous researches is also a very rich source of information for project topics. Every research project has two major areas that are important about pointing towards an area of research. The first is the finding. An examination of the findings of a research work inevitably points to the things that a researcher did not find. Maybe because of not adding a particular variable or as a result of not manipulating one. An observation of this will enable a researcher to know what to add in order to make the study better and sort of start off from where the previous researcher stopped. The second aspect is the suggestion for further studies. This is the most important source among the two. This is where a researcher makes candid suggestions for further studies and this enables the person reading to know which areas are open for studies from the previous researchers point of view.

e) **Prevailing problems**: Every area has a prevailing problem as much as every country has its own. Hence, the need to look at the prevailing problem in the society as an area of departure in language and literary research. For instance, in Spoken English, the major problem in Nigeria is the interference of the native languages on English and as a result, no matter how the average Nigerian tries, their accent will reflect where they are coming from. The questions along this line are: Why is this so? What can we do to reduce this? Are there better teaching methods that can be adopted? In an attempt to answer any of the following questions, the research student will come up with a viable research topic.

f) **Expert opinions (professors/lecturers and expert practitioners):** Expert opinion is another viable source of research topic. The question of who an expert is comes to bear in consulting experts or in choosing whom to consult. For the purpose of this discourse, an expert can be seen as someone with ample experience in a particular area of vocation, who has spent an appreciable number of years in that are and who has made visible impact in that area. More often than not, they are our lecturers or practitioners in a particular area we want to research in. a student who wants to conduct a research in advertising should know that company like Insight communications is an important place to visit in data gathering process or in the search for a viable research topic.

g) **Use of theories:** There are many theories in language and literary studies and one can focus one's research on any of the theories for one's project work. For instance, a researcher may study the application of the Minimalist theory to Selected Languages.

3.3 Characteristics of a Good Project (Research) Topic

1. **It must be researchable:** The first characteristic of a good project or research topic is that it must be researchable. Not all topics are researchable. The non-researchability of a topic might stem from ethical reasons to the inability to manipulate the selected variables. Hence, for a research topic to be relevant, the researcher must show that it is researchable.

2. **It must be interesting:** Most students go into research with the intention of just getting the project over with. This is a very wrong attitude to enter into a painstaking endeavor like research with. A wrong attitude will inevitably lead to abandoning the research work half way. Hence, it is advised that the research topic chosen by the student must be interesting to the student first and then to other people that will read it. Interest is will enable the student hold on even when the odds seem against him/her.

3. **It must contribute or add to knowledge:** Apart from the interest of the researcher, the topic must be able to add to knowledge. If a research is interesting but does not have substance, it can as well not be gone into. Most students tend to regurgitate the information that has already been researched on, worse still most enter into an area that has been over flogged, and hence, there is this inability for the research to contribute anything to existing knowledge other than what has been there from the outset.

4. **It must be within the ability of the researcher to carry it out:** One interesting observation is that students tend to engage in projects that they cannot carry out and as a result, abandon them most times half way. These projects commonly referred to as 'elephant projects' have contributed immensely to students spending extra years in school. It is advised that the researcher in choosing a research topic must be able to show flexibility and competence to carry out the research in the allotted time.

4.0 CONCLUSION

In this unit, we have explained the various sources of research topics with various examples, distinguished between primary and secondary

sources of data, and have stated the characteristics of a good research topic. These sources reduces the challenges students face in searching for research topics and provides an avenue for them to own the topic they are able to come up with.

SELF-ASSESSMENT EXERCISE

1. Describe the characteristics of a good research.
2. What is a microfilm and how is it used?

5.0 SUMMARY

In this unit, you have learnt:

- the sources of research topics
- how to distinguish between primary and secondary sources
- the characteristics of a good research topic.

6.0 TUTOR-MARKED ASSIGNMENT

1. Distinguish between primary and secondary sources of information.
2. Mention and describe three types of primary information source in relation to research.
3. Explain the characteristics of a good research topic.

7.0 REFERENCES/FURTHER READING

Egbule, J. F. (2004). *Practical Guide to a Successful Project or Thesis Writing and Defense*. Owerri: Whyte and Whyte Publishers.

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UNIT 2 THE NATURE OF RESEARCH PROBLEMS AND PROBLEMS OF RESEARCH IN NIGERIA

CONTENTS

1.0 INTRODUCTION

Research problems refer to the major reasons that motivate the research. There are usually issues, which the researcher is set to find solutions to. Therefore, to understand the research problem, it is important to define the problem. Problems are stated in research works to guide the researcher in the problem that he/she is to solve. These points to the fact that for a problem to be solved, it must be researchable. For it to be researchable, it must have theoretical and practical significance. The research problem must also be specific, measurable, achievable, result oriented and time bound. It must contribute to the increase of knowledge and improvement of prevailing situations. Explaining these processes is what this unit is set to accomplish.

2.0 OBJECTIVES

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

- describe the nature of research problems
- describe how we arrive at a research problem
- state the characteristics of a research problem
- state the problems of research in Nigeria.

3.0 MAIN CONTENT

3.1 The Nature of Research Problems

The ability to recognise the problem in any area is what makes us good researchers. There is an inner prompting in every researcher to look at different sides of a finding and almost immediately proffer solutions to the unsolved problems. In understanding the nature of research problems, it is imperative to make two vital categorical statements from the outset.

1. Every research is engaged in to solve a problem
2. There is a problem in every research endeavour

These statements seem self-evident but are often overlooked to the peril of most researchers and students. The first question is 'what is a problem?' The Microsoft Encarta (2009) defines a problem as a difficult situation, matter, or person. It also went further to define it as a question or puzzle that needs to be solved. With regard to research, a problem can be seen as 'a difficult situation or matter to be solved through a research or a question or puzzle that needs to be solved through research.' It is the main reason ***why the research is being embarked upon.*** This describes how the researcher arrived at the hypothesis he wants to investigate.

3.2 How Do We Arrive at a Research Problem?

The researcher arrives at a research problem firstly through literature review. Remember at the outset of this unit we mentioned that every research has a problem. The researcher in the process of literature review sees a gap and sets out to fill it and this becomes a problem to solve. Secondly, the researcher might be going through the methodology section of a research work and in the process, he sees a methodological problem and in an attempt to solve it, he goes into research. Thirdly, there could be a lacuna in the statement of the hypothesis of a research and as a result, an attempt is made to fill it and that gap becomes a problem to be solved.

Once these sources are examined, the researcher asks himself such questions as: What led to the finding in this research? Are there better ways of looking at the findings? Are there things that were not taken into cognizance in the process? To answer these questions, the problem of research must be stated in a pragmatic way. Another question that seeks an answer is what are the sources or research problems?

3.3 Sources of Research Problems

1. Previous research findings
2. books, journals
3. personal and everyday experiences,
4. ideas and interest
5. pressing demands in an area
6. need to fill up gap
7. previous researches
8. prevailing problems
9. expert opinions (Professors/lecturers and expert practitioners)
10. Use of theories

These have been explained under the sources of research topic in the first module; you are advised to read again that portion in order to understand how they are viable sources of research problems.

3.4 Characteristics of a Research Problem

The following have been identified as the major characteristics of a research problem:

1. The research problem should describe the relationship between two or more variables
2. The research problem could take the form of a question.
3. The research problem must be capable of being tested empirically (that is with data derived from direct observation and experimentation)
4. The question is specific enough to avoid confusion and to indicate clearly what is being studied
5. Through the use of operational definitions, researchers can specifically and clearly identify what (or who) is being studied
6. The research problem should be composed of a precisely stated research question that clearly identifies the variables being studied

3.5 Problems of Research in Nigeria

1. Inadequate research environment
2. Lack of research data of previous researches
3. Prevalence of the use of unacceptable research instruments
4. Unavailability of adequate funding
5. Inadequate exposure to modern research trends
6. Inadequate funding of few existing research institutes
7. Existence of bottle necked administrative procedures of result authentication

We can explore these points in some detail.

4.0 CONCLUSION

In this unit, we have explained the nature of research problem, we have described how we arrive at a research problem, we have stated the characteristics of a research problem and have also stated the problems of research in Nigeria. It is important to note once again that the first step in solving a problem is defining it. Once a problem is adequately defined and its nature is understood, it is then easy to solve it.

SELF-ASSESSMENT EXERCISE

1. What are the problems of research in Nigeria?
2. State and describe sources of research problems

5.0 SUMMARY

In this unit, you have learnt:

- the nature of research problems
- how we arrive at a research problem
- the characteristics of a research problem
- the problems of research in Nigeria

6.0 TUTOR-MARKED ASSIGNMENT

1. State and explain six sources of research problems.
2. State five characteristics of a research problem.
3. Mention and explain five sources of research problems.

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MODULE 3 COMPONENTS OF ACADEMIC RESEARCH AND RESEARCH DESIGN IN LANGUAGE AND LITERATURE

UNIT 1 COMPONENTS OF ACADEMIC RESEARCH

CONTENTS

1.0 INTRODUCTION

The process of research starts with the researcher being able to identify what obtains in the area he/she is researching. What obtains in that area includes the past and the present facts within that area of interest. Often, the motivation for the research is identified. This motivation dovetails to the problem, which exposes the gaps to be filled by the current research. This in research terminology is called the background of the study. After the researcher is able to see this and writes it out, he further tries to formulate or put out the set actions that he intends to achieve as a result of the research. This in research is called the objectives of the research. The researcher further raises some tentative testable and falsifiable statements which explain the phenomenon or the event that he is out to study. These statements in research are called research hypotheses. The researcher further raises questions, which reflect the hypotheses and the purpose for which he sets out to research. These questions, which the research seeks, answer to are called research questions.

This unit aims at explaining to you these processes and how to apply them. This will enable you appreciate and apply effectively these steps.

2.0 OBJECTIVES

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

- write a viable background of the study
- write effectively the objectives of the research you intend to embark on
- formulate hypotheses
- formulate research questions.

3.0 MAIN CONTENT

3.1 Components of Academic Research

3.1.1 The Background

In academic research in language and literature, especially when it concerns the award of degrees, the first point of departure is the background to the study. The background to the study gradually points out the relevance of the study and brings out previous researches done in that particular area in order to support the reason for the present research. The background rather traces the process of growth of the area of concern, what has happened over time and gradually funnels it down to the statement of the research problems within the area of interest and thereby enabling the objectives (purpose) and relevance of the study to be enunciated.

What Does the Background to the Study Section Add to the Reader of the Thesis?

The background to the study provides a gradual stepping stone to the understanding of the research problem. Here, the researcher tries to provide the reader with background knowledge to the study. This more often than not centres on the definition of the concept. The background to the study section explains the topic in various ways. For instance, it gives the general meaning of the terms used in the topic conceptually, dictionary definition is at times used and definitions by other authors are also applied to arrive at a proper definition. It is however important to note that this is different from operational definition of terms which focuses on the physical process (measurement) we use to identify the construct.

Also, of importance is the fact that the background to the study examines the present developmental efforts in that particular area of research, it also looks at the convergent and divergent views and advanced made. This provides an introduction to the whole research work.

Key Points to Note about the Background to the Study

a) It must be written in a simple understandable form
b) It must be in a prosaic form
c) It must not be flooded with literature
d) It must be interesting

3.1.2 OBJECTIVES

The objectives of the study are at times referred to as the purpose of the study by some disciplines like Psychology. There are two major aspects of the objectives of the study. The first aspect is the general objective while the second is the specific objective. The general objective aims at finding out how variables A, B, C relate to variable D. While the specific objectives take each of the variables individually and state how one is going to handle each of them in the study.

The objectives of the study set the stage for the research process. They determine the appropriate analysis to be used for each objective as well as the sampling procedure to be adopted in selecting samples for the study. It also determines the experimental design to be used for the study. To have good objectives, you are advised to start each objective with a verb especially ones that are transitive in nature for instance, identify and so forth. The statement can then read: To identify …; To provide…; To suggest...; To acquaint…; To notify…; To inform…; To define…; To evaluate; To appraise…; To ascertain….

The objectives of the study section should acquaint any reader with basic information regarding the research. For instance, it should at least bring out the what, how, and why of any study i.e. what one wants to study, how one intends to study it, and how one intends to go about it. It is also important to note that the research objective directly follows the research problem because it specifies in bullet points how each of the research problem aforestated would be solved. It is also important to explicitly state that the objective of any research is directly derived from the statement of the problem of that research.

Key Points to Note about the Objectives of the Study

1. It must be stated in a concise manner
2. It must respond to the problems of the research
3. It must point to a research procedure
4. It must subtly point to a procedure for analyzing the study

3.1.3 Hypotheses

Once the objective of the research is understood and the problem has been stated in an explicit form, it is important to state the hypotheses. Hypothesis is a tentative solution to the research problem advanced by the researcher Hypothesis is a testable prediction about the relationship between two or more events, characteristics or variables. It also consists of a specific potential explanation for the occurrence of an event.

Interestingly, the research hypothesis is stated after the theoretical and conceptual framework and the literature review. This is to enable the researcher have a good grasp of the concept, see what others have done in the area and take these as a point of departure in arriving at testable predictions about the occurrence of events.

Aboh (2004: 33-34) identified the following as the criteria for scientific hypothesis:

1. It must be both testable and falsifiable
2. It must be precise
3. It must be rational and parsimonious
4. It must be capable of being directly supported or unsupported by the results of an experiment

There are six different types of hypothesis namely:

1. Universal hypothesis
2. Existential hypothesis
3. Null hypothesis
4. Alternative hypothesis
5. Causal hypothesis, and
6. Descriptive hypothesis

One question that arises is this: why is it important to state a hypothesis in a research work? The importance lies in the fact that it helps the student have a potential answer to the raised question or a potential direction that he/she anticipates the result to tilt towards. The hypothesis is empowering. It makes the researcher become a significant part of that which he/she is researching. Hence, he/she states it either directionally

or non-directionally. While the directional hypothesis points towards a given direction, a non-directional hypothesis does not point towards a given direction. With regards to the hypothesis that does not point towards a given direction (non-directional), we have the NULL **[H_O]** and the ALTERNATE **[H_I].** While the null predicts NO effect of the independent variable, the converse, AN effect of the independent on the dependent variable is the focus of the alternate hypothesis. For instance, a non-directional hypothesis will go thus:

HO: There will be no effect of caffeine on recall ability
HI: There will be an effect of caffeine on recall ability

A research hypothesis can come up as a result of theory, models, observations, experiences, literature, findings from other researches, suggestions, personal observations and intuition. Most times however, researchers tend to form their hypothesis from the statement of the problem or research questions. Another issue that needs prompt attention by the researcher is the testability of a hypothesis. Most hypothesis are not testable hence, there is need for the researcher to formulate his/her hypothesis with the help of a more experience researcher i.e. the supervisor. It is also important to note that just as the objectives of the study; the hypothesis shows the research procedure and the research method.

The hypothesis also determines the decision we make in the research or statistical process. We pointed out earlier that the directional hypothesis points towards a given direction while the non –directional does not point towards a given direction (Aboh & Obidigbo, 1998). It is important to give instances of both types of hypothesis in order to clarify these concepts. The directional hypothesis can be stated thus:

English major students will perform better than French major students in ENG 111

While the non-directional hypothesis can be stated thus:

There will be a difference in the performance of English major and French major students in ENG 111
Or
There will be no difference in the performance of English major and French major students in ENG 111: ***Introduction to Spoken English***

The first hypothesis above is always referred to as the **ALTERNATE** hypothesis while the second is always referred to as the **NULL** hypothesis. The important point is that the direction of the hypothesis determines the critical region where we will check for statistical

significance or non-significance. This brings to the fore the concept of tails.

The directional hypothesis is always tested under one tailed test while the non-directional hypothesis is checked under the two-tailed test of the critical value of the statistical table. These directions are explicitly pointed out on the statistical tables but it is imperative to restate that when the hypothesis is stated in the directional form, the critical value should be checked under the level of significance for directional test (one tailed test) while when the hypothesis is stated in the non-directional form, the critical value should be checked under the level of significance for non-directional test (two tailed test). in order to understand this better, it should be noted that the directional hypothesis leaves us with just one option while the non directional hypothesis leaves us with an either/or option.

Making Decisions about the Non – Directional Hypothesis

There are two major decisions that can be made about the null and the alternate hypothesis. We can either reject the null hypothesis when we ought to have accepted it, this is a Type I error or we can accept a null hypothesis when we ought to have rejected it, this is a Type II error. Type I error is also called False Positive while the type II error is also called the false negative. With regards to the null and the alternate hypothesis, the table below will suffice while another will suffice for the alternate hypothesis.

For the table below, a correct statistical decision is made when we accept HO (Null Hypothesis) when it is true while an incorrect statistical decision is made when we accept the HI (Alternate Hypothesis) when the HO (Null) is true. This is called a Type I error.

DECISION	**NULL [HO] IS TRUE**
ACCEPT HI	**TYPE 1 ERROR**
ACCEPT HO	**CORRECT DECISION**

In addition, for the table below, a correct statistical decision is made when we accept HI (Alternate Hypothesis) when HI is true while an incorrect statistical decision is made when we accept the HO (Null Hypothesis) when the HI (Alternate Hypothesis) is true. This is called a Type II error

DECISION	**ALTERNATE [HI] IS TRUE**
ACCEPT HI	**CORRECT DECISION**
ACCEPT HO	**TYPE II ERROR**

3.1.4 Research Questions

Research questions are questions that we seek to provide answers to as a result of the research we are embarking on. Research questions naturally come in question forms. Research question follows directly from the objectives of the study and possibly the hypothesis. The major difference between the hypothesis and the research question is that the hypothesis is directly tested with inferential statistics while research questions are answered with descriptive statistics.

Most researchers use either the research hypothesis or the research questions.

Key Points to Note about the Research Questions

a) The research question must be written in a simple understandable question form
b) It must be related to the topic of interest
c) It should be related to the objectives of the study
d) The question must be answerable
e) The research question must be clear and concise
f) The research questions must be related to the research design, data collection method and analysis.

4.0 CONCLUSION

In this unit, we have tried to explain the components of academic research starting with the background of the study, which tells us what is about to be studies; the objectives of the study which tells us the aim of the research; the hypotheses which makes prediction about the result of the research and the research question which raises questions that seek answers during the course of the research. Students are encouraged to master these processes in order to effectively apply them in research situations.

SELF-ASSESSMENT EXERCISE

1. What is a hypothesis?
2. Mention and explain the types of hypotheses.

5.0 SUMMARY

In this unit, we have discussed the:

- definition and explanation of the background of the study
- research objectives

- hypothesis
- research questions

6.0 TUTOR-MARKED ASSIGNMENT

Formulate a researchable topic and briefly write the following:

i. The background of the problem
ii. Raise three hypotheses in the null and alternate forms
iii. Raise three research questions
iv. Raise three objectives of the study

7.0 REFERENCES/FURTHER READING

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UNIT 2 QUALITATIVE RESEARCH DESIGN

CONTENTS

1.0 INTRODUCTION

The research or project work is akin to building a house. So many components go into it but at the end, a complete house is seen. However, the major difference between building a house and embarking on a research work is that in house building, people do not ask the house owner how he/she mixed the sand, made the block and how many buckets of paints and labourers were used for the construction .However, in the research design procedure, people are out to only examine the 'how' of the research that is, people are more concerned about how the researcher conducted the research more than the result of the research.

Hence, it is important to understand the procedure for designing and conducting research in language and literature. Research design deals with the procedure used for selecting the subjects, assigning them to treatment conditions, instruments used, how observation and measurement were done. The research design is about the most important aspect of the research process because it equips the reader with the 'how' the research was done so that they can replicate it. This unit is aimed at explaining how qualitative research is designed, how data is collected, analyzed and reported in qualitative research.

2.0 OBJECTIVES

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

- describe qualitative research
- state the types of qualitative research
- sate the methods of qualitative research

- identify the advantages and the disadvantages of the qualitative research methods.

3.0 MAIN CONTENT

3.1 Qualitative Research

Qualitative research is inductive, subjective and process oriented with the goal of achieving the knowledge being sought for from the participant's point of view. Hence the researcher is the main focus in this type of research since he/she is the instrument used in data collection, qualitative researches are said to be subjective and uses narratives which are the result of the researcher's analysis of the information provided by the informants used in the research. In contrast, quantitative research focuses on quantifying or using numerical data. It is deductive in nature and is aimed at fact finding and cause and effect. It takes into cognizance control of variables and is objective.

3.1.1 Types of Qualitative Research

1. Phenomenological research method
2. Foundational research
3. Historical research
4. Grounded theory
5. Philosophical research
6. Ethnography

1. Phenomenological Research Method

Phenomenological research method focuses on the subjective experience of the individual as the individual presently experiences it. It takes into cognizance the 'here and now, that is, the present conscious experiences of the individual under study. It does not take into cognizance facts like theories and assumptions.

2. Foundational Research

The main fulcrum of foundational research is the examination of the beliefs, which individuals hold over a long time in juxtaposition with what obtains in the present. Foundational research is like a bridge between what has been and what is and how both could be married together so that change can occur. It is this point 'propensity for a change in knowledge base' that is the major difference between this and historical research.

3. Historical Research

Historical research focuses on examining the past in order for present phenomenon to be explained via the past information obtained. This aspect of qualitative research although it looks at the past, is used to explain the present and make projections concerning the future. This research does not look for a 'change in the knowledge base' as in foundational research, but tries to explain phenomena's and make predictions concerning future occurrences.

4. Grounded Theory

Grounded theory is a qualitative research method used especially in theory generation. In simple term, it simply means the 'ground' basis, reason, justification or foundation on which a theory is formulated from the data gathered. The data from grounded theory is used to generate a theory. In the traditional research method, theory is first established and then data is then generated to establish the theory. While in grounded theory, the researcher goes into the field, generated data, then based on the data gathered, theory is formulated. In grounded theory, the researcher first memos, that is, writes ideas about the information gathered during the coding of the data obtained. This is then sorted and then, writing up of the information follows and then, theory is come up with. Studies on language preferences can be executed with the grounded theory.

5. Philosophical Research

Philosophical research is field specific and this type of research is not engaged by just anyone. Philosophical research adopted into by experts alone. The experts try to chart a course for their specific discipline by intellectually analyzing information and coming up with facts, which address particular issues in their disciplines.

6. Ethnography

Ethnography is a data gathering method that focuses on obtaining information concerning societies and cultures. Its method of data gathering uses all qualitative research methods, which include participant observation, in-depth interview, focus group discussion and so forth. This social research method utilizes the *emic* and *etic* issues in understanding cultures. While the *emic* issues focuses on the understanding of the culture from an insider's that is, cultural members' point of view, *etic* issues focuses on the description of phenomena in ways applicable to other cultures. The *etic* perspective is unbiased and

does not take sides in contrast to the *etic* point of view. Fundamental research id dialectology depended on ethnography.

3.2 Methods of Qualitative Research

1. Participant observation

Participant observation is a qualitative research method whereby the researcher enters into the field, becomes a part of the population of study. For instance, if someone wants to use the method of participant observation to examine and report a case of masquerade groups in oral literature, the researcher may be expected to join the group in order to obtain the information. Participant observation is advantageous because it enables the researcher to obtain direct information. It also sheds light on gray areas of research and most importantly, it helps the researcher not to lose data in the process of research. However, it has some disadvantages because it is time-consuming. Participant observation is also very subjective in its approach in that it is only what the researcher wants to note that he will note. Many researchers may not take the risk of joining groups that may be dangerous.

2. In-depth interview

An in-depth interview is a systematic way of obtaining detailed information about a person's opinion, beliefs, experiences and so forth, through a one-on-one interaction between the researcher and respondent. In in-depth interview, the researcher engages in a personal or person-to-person interaction with the client in order to elicit information concerning the variables under study. In-depth interview is advantageous because it enables the researcher to elicit information he would not normally have elicited through a questionnaire or even through a focus group discussion. The nature of in-depth interview is unstructured. This means that the respondent is allowed 'free style' on the topic of interest that is to say all that is within his or her knowledge concerning it. There are no restrictions with regards to the structure and timing of the responses. One can, in the process of answering a question, touch on other matters of interest in the discussion provided the areas are significant in the final outcome. It is important o note that there are various methods of recording information during the interview process. It could be recorded with either an audio or a video recorder but care should be taken to obtain the consent of the interviewee before adopting either. It is also important for the researcher to transcribe such information immediately after the interview to reduce loss of information. In order to elicit as much information as possible from respondents during in-depth interview, it is imperative for the researcher to ask only open-ended questions and encourage the respondent to

respond in a detailed manner to the raised question. Hence, in so doing, the respondent freely expresses his opinions, experiences and beliefs concerning the subject. The researcher is also supposed to provide a plan of action, an interview protocol and guide, if possible and when needed, train research assistants, collect, analyze and interpret the data.

In-depth interview is a research method of choice when a researcher wants detailed clarifications concerning the variable of interest. The researcher here aims at exploring in-depth issues of interest from the standpoint of the respondent. In in-depth interview, the researcher does not only record the information given by the respondent but also records what he observes, his own reflections on the subject matter that was discussed and also other conversations. The in-depth interviewer must be a good listener, must be patient, must be open minded, must be able to transcribe the information obtained from respondents or interviewees and must be able to note none verbal cues in the interviewee. Hence, it could be in the form of the following:

- Structured
- Semi structured
- Unstructured

Unstructured in-depth interview: In an unstructured in-depth interview, the respondent is not stringently compelled to explore the theme or topic developed by the interviewer. The questions are open-ended, hence, the informant or respondent expounds on the topic. Here, the use of questionnaire or other methods that structures the process of the in-depth interview is not made. The researcher in this aspect of in-depth interview follows, providing ideas in a non-imposing way while the respondent leads the way.

Semi-structured in-depth interview: In semi-structured in-depth interview, the researcher takes a middle course. He follows a particular structure when there is need but at other times, he allows the respondent answer the proposed question the way the respondent wants. Herein, information obtained can be used both qualitatively and quantitatively.

Structured in-depth interview: In structured in-depth interview, the researcher enters with intent to streamline what would be discussed and he does not give the respondent any opportunity to digress into any detail even if the detail will be beneficial to the topic at hand. Here, the researcher enters into the process with a goal in mind and focuses only in achieving that particular goal or eliciting that particular information. However, it is imperative to note that the techniques of these three procedures of in-depth interview are different from those applied in the ordinary interview process.

Advantages

1. In -depth interviews are not as stressful as other qualitative research method approaches. It is easy to conduct.
2. Immediate clarifications could be further elicited from the respondent immediately issues are raised towards that direction.
3. In-depth interviews are in-depth in nature because they provide deeper information than other methods can provide.
4. In-depth interviews are useful when the research procedure requires sensitive information which must be personally obtained after the creation of adequate rapport.

Disadvantages

1. Social desirability which means that the respondent might respond to some questions in a socially desirable manner which may not be a true reflection of the truth is a major challenge here
2. In-depth interview is time consuming from the participant gathering stage t the interview proper and the transcription and so forth is a long time.
3. The present emotional state of the respondent might influence the respondent's responses
4. The interview setting must be stringently chosen so as to reflect privacy and this is not always easily achievable
5. The process of choosing the right participants or respondents is always tedious
6. In-depth interviews are subjective. The researcher might add his/her own bias while the respondent can also do the same in responding.

3.3 Focus Group Discussion (FGD)

Focus Group Discussion (FGD) is a qualitative method of data gathering that is aimed at obtaining in-depth information from a particular group of people called the focus group. The process involves a facilitator and a group of about 6 – 12 persons who have the same background. The researcher acts as the facilitator, with the group members discussing the topic raised by the facilitator freely. In some cases, there are co-facilitators. Sometimes, an FGD is not completed in a day. Once this is so, the researcher adjourns the session as many times as possible until all the information is exhausted. An FGD is particularly aimed at eliciting attitudes, ideas or perceptions of the group. An FGD can be in the form of teleconferencing where a telephone conference is used real time to get information from a group of respondents and more recently, there is increased use of the on-line type called the on-line FGD. In conducting an FGD, the researcher chooses the objectives of the meeting, plans the

meeting session, carefully selects the group using his pre planned selection criteria, schedules the meeting in a conducive setting, sets ground rules and holds the session. It is important for the researcher to immediately make notes of the meeting after the session.

Advantages of FGD

1. FGD enables the researcher have an ample information on the topic within a little period of time
2. It takes into consideration the specific opinion of each group member
3. FGD produces responses that are equal to those of the population from which the focus group is drawn
4. It is easy to conduct
5. FGD is not capital intensive

Disadvantages of FGD

1. FGD is not appropriate for use as a single research tool, it is most appropriate to use it with another research tool
2. There is also the need to always conduct more than one FGD so as to have a representative sample
3. FGD cannot be used to discuss very sensitive topics like sexual exposure, etc
4. In FGD, the researcher has no absolute control over the respondents
5. There is also the challenge of social desirability
6. FGD is subjective since the researcher will have to analyze the information

4.0 CONCLUSION

In this unit, we learnt about the various qualitative research methods and their types. We have also examined the advantages and disadvantages of qualitative research methods like interview, participant observation and focus group discussion.

SELF-ASSESSMENT EXERCISE

1. State three advantages and disadvantages of the FGD.
2. Distinguish between structured, unstructured and semi structured interview, pointing out their similarities and differences.

5.0 SUMMARY

In this unit, we have discussed:

- types of qualitative research
- methods of qualitative research
- the advantages and the disadvantages of the qualitative research methods.

6.0 TUTOR-MARKED ASSIGNMENT

Formulate a researchable research topic and design the research with the following types of qualitative research design:

1. Ethnography
2. Phenomenological paradigm

7.0 REFERENCES/FURTHER READING

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UNIT 3 QUANTITATIVE RESEARCH

CONTENTS

1.0 INTRODUCTION

More often than not, social scientist or researchers in humanities engage in survey researches. This entails the administering of questionnaires and the statistical analysis of such. This is the basis of quantitative methods of research. The quantitative researcher unlike their qualitative counterparts sets out to put the result of their research in numeric form. Hence, the researcher adopts a stringent research method, controlling secondary variable, constructs scales if possible, or uses other research tools and is objective throughout the course of the research and lastly subjects the outcome of the research to statistical analysis. This is the major point of departure for quantitative research – analysis.

In this unit, you will learn how to design a quantitative research.

2.0 OBJECTIVES

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

- describe quantitative research
- design researches using quantitative methods
- identify researches where quantitative research methods was applied.

3.0 MAIN CONTENT

3.1 Quantitative Research

Quantitative study focuses on the use of numbers in describing occurrences this sharply contrasts with qualitative described above which uses words to describe rather than numbers. Not all quantitative researches are experimental in nature. There are non-experimental

quantitative studies, which does not allow for randomisation and the manipulation of variable. In quantitative research, there is a stringent process of designing the study procedure before the research is embarked upon. In addition, the procedure establishes research questions, purposes and objectives for which the researcher is embarking on the research for data collection and statistical analysis.

In quantitative research design however, questionnaires, scales and inventories are used for data collection and most importantly, the data obtained through the process is quantified statistically. Hence, there is a great deal of objectivity in the research process, hence the use of samples, which are a representative of the population and the reference of each person in the sample as subjects. However, an important point to note is that every quantitative research design begins with a hypothesis, which is a tentative description of the occurrence of events. also, the results obtained from a quantitative research are generalised to the population.

3.2 Quantitative Research Design

In designing a quantitative research design, the first thing to be borne in mind is the fact that data is objectively needed in quantifiable form and this fact influences all that the researcher does in the process of designing the study.

1. Research question
2. Statement of the problem
3. Purpose of the study
4. Relevance (Significance) of the Study
5. Hypothesis
6. Methods (Research Design, Setting, Participants [Population/Sample]), Research Instrument (Instrumentation], Reliability and Validity, Norm, Scoring), Procedure [Sampling Procedure], Statistics
7. Results (Descriptive Statistics Result, Inferential Statistics Result)
8. Discussion (Hypotheses Testing [Hypothesis Specific Discussions])

The research questions are the questions raised by the researcher to address the main reason why the research is embarked upon and a successful answering of these questions means that the research is successful. These questions are really the main reasons for the research. The research question must be specific. It must be directed at a particular area, it must be measurable, that is, it must be quantifiable,

and It must also be researchable that is results concerning it must be achievable during the course of the research.

The statement of the research problem is one of the most important aspects of the quantitative research design. When the problem is identified, the data collection process becomes precise with the analysis lending itself to precision. An ill-defined problem has no solution. Hence, the researcher must be able to know the problem being faced in the society that the research is pointing towards solving. In order to state a problem well the researcher must also be able to state what led to it. That forms the background to the problem. To find out problems is easy. All one needs to do is to look around the environment, use ones experience, and look at theories, past researches and printed materials. Often, research problems derive from controversies, inadequate information or the existence of obsolete approaches

The purpose and relevance of the study is also vital in the research process because they address the reason for embarking in the study. The relevance addresses what people will gain as a reason of the research outcome. The relevance looks at the society's gain, the participant's gain, the policy maker's gain and all that others to whom the research bears relevance stand to gain.

The hypothesis as have been described earlier is a tentative answer to the questions the research is out to address. It is a testable prediction about the sequence of events in a study. The research hypothesis is usually derived from the research questions by restating the research questions in a statement form. Research hypotheses could be derived from previous researches, personal experiences, or from printed materials. Hypotheses give the researcher something tentative to look forward to in the process of the study.

The methods (or methodology) in quantitative research design comprise the different procedures applied by the researcher in obtaining results for the study. It has the research design, which explains the technique for organizing or arranging the variables under study. A study design points out in explicit terms the number of variables, the number and types of treatment, the groups involved and how the variables are assigned to the groups. There are many types of research designs, which include the following.

1. Same subjects/ within subjects/ matched subjects/related designs/ repeated measures
2. Different/double subjects/ between/ /unrelated subjects
3. Correlational designs
4. ABA design

5. Pretest posttest design
6. Pretest post test control group design
7. Randomized two group design
8. Randomised one way ANOVA design
9. Repeated measures design

The setting of the study is another important aspect. This addresses the location that the study will take place in. Is the study going to take place in a hospital setting, school setting, along the road, in an industry in a corporate organisation? The research title or topic determines the research setting. Sequel to the setting, are the participants that the study will use. The participants are the research subjects who will respond to the questionnaire or research instrument that the researcher decides to use for the study. The participants are drawn as samples from a population. While population refers to the total number of people or cases in a specific area, a sample is a selected representative fraction of this.

The research instrument is the major tool for data collection. This could be either a questionnaire or other instruments. The questionnaire is the major data collection tool used in quantitative research. In constructing the questionnaire, the researcher considers the content and number of questions to be included, considers the way the questions will be worded. Is the questionnaire able to elicit the required information? Will the respondent understand the questionnaire? Consider the response format. Is it a forced choice (close ended) or an open-ended questionnaire? Is it in the Likert form (several options) or dichotomous (yes or no)? The sequence of the questions is another issue. Should it be from the easy to the hard or vice versa, should it be preemptive or reactive?

Once the research instrument is developed, the pretesting or pilot study is done. This is to determine the reliability and validity of the research instrument and to establish the norm and scoring pattern of the questionnaire.

The procedure outlines the sampling procedure and the research procedure. It states how the samples were selected, method of selection, the number, whether they were given incentives or not. The final stage in the methodology is the statistics. There is the need for the researcher to make a good choice of the statistical procedure to use for data analysis. However, it is important to note that the statistics is determined by the design of the study. We shall expound on this in subsequent modules.

The final stage in the quantitative research design process is the presentation of results of the analyzed data. The results come in two forms, the descriptive and the inferential. These two shall also be discussed in subsequent modules. After the result section, the next stage is the discussion session, which has as its main thrust the testing of the raised hypotheses along with the discussion of specific hypotheses. While hypothesis testing focuses on the testing of the hypothesis with the appropriate statistical procedure, the discussion of specific hypotheses highlights the implications of the outcomes of the research with regard to that specific hypothesis and the results obtained.

4.0 CONCLUSION

In this unit, we learnt what quantitative research is about and the process of designing researches using quantitative methods. It is important to reiterate that quantitative research involves the selection of participants using research instruments, the control of other unnecessary variables and the statistical analysis of such data.

It is expected that by now you should be able to identify researches, which apply quantitative research methods, as well as those that will thrive on quantitative research methods.

SELF-ASSESSMENT EXERCISE

1. What is quantitative research design?
2. State and describe the quantitative research procedure.

5.0 SUMMARY

In this unit, you have learnt:

- what quantitative research is
- how to design researches using quantitative methods
- how to identify researches which applied quantitative research methods.

6.0 TUTOR-MARKED ASSIGNMENT

1. Distinguish between qualitative and quantitative research design.
2. What are the advantages and disadvantages of quantitative research design.

7.0 REFERENCES/FURTHER READING

Bryman, A. (2008). *Social Research Methods*. UK: Oxford University Press.

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UNIT 4 LIBRARY/DESK RESEARCH

CONTENTS

1.0 INTRODUCTION

Library/desk research is simply aimed at utilising already existing information or data set for the purpose of research. This makes use of publications of all kinds, which include government data and other databases. The major difference between literary/desk research and other research methods is that while other research methods make use of fresh data, desk research makes use of existing data. Hence, there is no need for raw data collection.

This unit is aimed at explaining to you library/desk research and how it is designed.

2.0 OBJECTIVES

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

- describe literary/desk research
- design literary/desk researches
- state the advantages and disadvantages of applying literary/desk research.

3.0 MAIN CONTENT

3.1 Literary/Desk Research

Desk or library research is a research method, which focuses on using existing information for research purposes. Desk research is also known as **secondary data or research**. Clarification is needed here between this method and historical research methods. In historical research, past events are evaluated for the reason of understanding present phenomena and making future predictions. Hence, in desk research, past information

is not necessarily focused on but also present data. In desk research as the name implies, the researcher does not go into the field to collect new data.

Desk or library research could be done by going to the library to source for information. There are two major types of desk research: **comprehensive searching and secondary analysis**. Comprehensive searching deals with searching out existing knowledge concerning the research topic before commencing the research while secondary analysis utilizes published data for research purposes. This could be government statistical policy documents, annual reports, previous research data and data from various databases.

3.2 Designing Desk/Literary Research

In designing the desk or library research, it is important to identify the problem to be solved; develop a research strategy; locate the information; use the information and, synthesize the information. The researcher must endeavour to state clearly the questions he needs to answer, look for the research tool required in finding the answer. The research tool could be dictionaries, encyclopedias, bibliographies, handbooks, collection of articles, library catalogues or even journal articles. The researcher can also make use of the website, which has made the world a global village. Once this is embarked on, the researcher endeavors to locate the exact information needed and in doing this, the researcher evaluates what has been obtained. The researcher also reads and makes notes of what is needed. This is followed by the synthesis of the information in an integrative manner that answers the question raised at the beginning of the research. Indeed, desk research is ideal for literature. However, the researcher is expected to interpret the full implications of the information derived.

Advantages of desk/ library research

1. Desk/library research is simple and easy to conduct.
2. Desk/library research is quick to carry out.
3. Desk/library research does not involve fieldwork, which is time consuming.
4. Desk/library research involves assessing a lager database thereby providing large body of information for analysis to the researcher.

Disadvantages of desk/literary research

1. The researcher involved in desk/literary research may find out that there is limited information concerning the research and this might involve abandoning the research work.
2. Desk/literary research may at times involve information overload, which is inimical to research success.
3. Desk/literary research require expert knowledge in order to sieve through data to obtain the required information.
4. Desk/literary research may use obsolete information in the research process.

4.0 CONCLUSION

In this unit, we have discussed about library/desk studies and how it is designed. We also discussed the advantages and disadvantages of literary/desk research. This is aimed at broadening the your understanding in research methods in linguistic and literary studies.

SELF-ASSESSMENT EXERCISE

1. What are the disadvantages of library/desk research?
2. Describe the library/desk research procedure.

5.0 SUMMARY

In this unit, you have learnt:

- description of library/desk research
- how to design library/desk researches
- the advantages and disadvantages of applying library/desk research.

6.0 TUTOR-MARKED ASSIGNMENT

1. What are the advantages and disadvantages of literary/desk research.
2. List the sources of literary/desk information.

7.0 REFERENCES/FURTHER READING

Bryman, A. (2008). *Social Research Methods*. UK: Oxford University Press.

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UNIT 5 SURVEY DESIGN AND EXPERIMENTAL DESIGNS

CONTENTS

1.0 INTRODUCTION

In designing a survey, there are some basic points to note. The survey design can at times incorporate other research designs for instance experimental or non-experimental methods. The underlying denominator in every research is that questionnaires are usually distributed. In experimental research however, certain points are constant with regard to the process. The researcher decides on the variables of interest; manipulates the independent variable; examines the effect of the manipulation on the dependent variable; and controls other concomitant or secondary variables.

This unit is aimed at exposing you to the process of survey design application and experimental design application.

2.0 OBJECTIVES

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

- describe survey design
- explain experimental design
- design simple experimental research projects.

3.0 MAIN CONTENT

3.1 Survey Design

The survey research method had been earlier discussed. Therefore, our focus here shall on the survey design proper. It should however be noted

that there are two major types of survey research: **cross sectional and longitudinal survey**. A cross sectional survey design as the name implies examines a cross section of a population at any given time while the longitudinal type examines particular population overtime. There are different ways of designing the survey research depending on the particular type one is engaging in. Among the many types of survey are the personal, telephone, panel, mail, opinion poll surveys, and so on. Designing a survey study does not follow a hard any specific rule. However, some components must be there for a survey design to be effective some of which are listed below.

1. It helps the researcher meet a particular objective
2. The questions should be straightforward
3. The sample must be the representative of the population through appropriate procedures given the research design and objectives
4. A survey should be both reliable and valid
5. Participants responses to survey questions should be analyzed appropriately and within the context of the question asked
6. Survey results should be reported accurately and ethically

A survey can be conducted using the questionnaire or the interview. The questionnaire contains a series of questions the respondent responds to, while the interview could be a one-on-one or a one on many methods the researcher uses to elicit research information from the respondents.

3.2 Experimental Design

The experimental research method is a research method that is used to establish cause-effect relationship among variables. The experimental study involves the manipulation of independent variables while holding other variables, which can act as confounding variables constant. Hewstone, Fincham & Foster (2005) views as a research method in which one or more independent variables are systematically manipulated and all other potentially influential variables are controlled (i.e. kept constant) to assess the impact of the manipulated (independent) variables on relevant outcome (dependent) variables. On the other hand, Smith, Nolen-Hoeksema, Fredrickson, Loftus, Bem, and Maren (2003) noted that experiments provide the strongest test of hypotheses about cause and effect. The investigator carefully controls conditions – often in a laboratory – and takes measurements in order to discover the causal relationship among variables. In Aboh's (2004) submission, experiments are organised to study behaviour through the manipulation of an independent variables, the control of as many other variables as possible; and the measurement of the dependent variables. There are mainly three kinds of experiment. They are:

a. Laboratory experiment
b. Field experiment
c. Natural experiment

A laboratory experiment is conducted in a well-controlled environment. It is mostly used in psycholinguistic experiments. A field experiment as the name implies is carried out in the field; that is, the real world. Here, the experimenter does not manipulate the independent variable but takes into account in the design of the study (experiment), the variations that will occur naturally. This is very popular in sociolinguistic research where the aim is to discover the relationship between social realities and linguistic behaviour. In some circumstances, researchers can take advantage of a natural situation in order to carry out an investigation. This is mostly done in circumstances, which they cannot themselves manipulate. Hence, it is done in a natural setting for the participants. In the classical studies of dialectology for instance, respondents had to be studied in the natural settings. Oral literature also favours the natural experiment.

The basic steps in conducting or designing an experiment are:

1. Formulation of a hypothesis
2. Selection of variables
3. Assignment of the variables into conditions
4. Treatment (manipulation) of the independent variable to observe its effect on the dependent variable
5. Control of other contrary variables (this allows researchers make causal inference that the independent variable caused the observed changes in the dependent variable (Shaughnessy, Zechmeister & Zechmeister, 2003)
6. Observation of the dependent variable
7. Measurement of variables
8. Drawing conclusions and relationships between variables

Experimental Designs

It is important that you acquaint yourself with the specific experimental designs used in research. For the purpose of this section, we shall be following as our point of departure in understanding the concept of experimental designs, the treatise, basic concepts in experimental psychology, by Aboh (2004).

1. **Same subjects/ within subjects/ matched subjects/related designs/ repeated measures:** Here, one independent variable or factor with one or two levels on a dependent variable.

2. **Different/double subjects/ between/ /unrelated subjects:** Here, we also have one independent variable or factor with one dependent variable but, there are two different samples or subjects here and they are not matched as in the case of matched subject design described above.
3. **Correlational designs:** Correlational designs deals with finding relationships between variables. It uses two groups of participants or one group but the underlying assumption is that it is used for examining whether there is a positive, negative, or neutral relationship between variables.
4. **ABA Design:** ABA design involves establishing a baseline, applying an independent variable, and removing that independent variable, that is, returning to the pre independent variable condition
5. **Pretest posttest design:** This involves one group of subjects or participants tested under two similar conditions. That is, before and after with no control group or one group of experimental subjects administered similar pretest and posttest with treatment effect between conditions
6. **Pretest posttest control group design:** This involves two groups of subjects or participants tested under two similar conditions that is, before and after with a control group. This means that both groups receive a similar pre test and a similar posttest but only the experimental group receives treatment effect between conditions.
7. **Randomised two-group design:** This involves two groups of participants assigned to two different groups – experimental and control group and then tested under one posttest condition. It is imperative to note that the experimental group receives treatment while both groups are from similar or the same pretreatment background.
8. **Randomised one way ANOVA design:** This is an experimental design that involves one independent variable with three or more levels or subgroups or categories where ache of the participating group is assigned to the different levels of the independent variable, which entails different treatment conditions.
9. **Repeated measures design:** Of interest here is the one –factor repeated measurement design, which involves the use of one independent variable with three or more levels, subgroups or categories where the participants are randomly selected and made to undergo the three or more levels of the independent variable. i.e. group one will undergo the three or more levels, then group two and so forth.

4.0 CONCLUSION

In this unit, we have been able to explain the surveys research design and the experimental design. You were also exposed to different methods of experimental designs, which will enable you carry out experimental researches.

SELF-ASSESSMENT EXERCISE

1. What is survey design?
2. What are the steps involved in carrying out survey design?
3. What do you understand by experimental design?

5.0 SUMMARY

In this unit, we have discussed:

- the concept of survey design
- the concept of experimental design
- how to design experiments
- types of experimental design.

6.0 TUTOR-MARKED ASSIGNMENT

1. Differentiate between matched and double subject design, stating their conditions for application.
2. Point out the statistical procedure for analyzing data obtained using the discussed experimental designs.

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MODULE 4 BASIC STATISTICAL TOOLS FOR LINGUISTIC AND LITERARY RESEARCH

UNIT 1 INTRODUCTION TO STATISTICS

CONTENTS

1.0 INTRODUCTION

Statistics is used in everyday language to express quantities. For instance, when a child uses wrongly the past tense formation rule three times within speech statistical information is used in the statement. This may not look scientific but when the number of errors the child commits per speech is analysed or when the number of errors per week is analysed and averaged, the statistical imperative is realised. Hence, we can see statistics as a mathematical tool for collecting, summarising, analysing and drawing conclusions from data.

This unit is aimed at explaining to you statistical process of data collection, definition of variables, measurement of data and how to make a correct choice of statistical test. It is expected that you will gain immensely by identifying how to apply statistical procedures in analysing data.

2.0 OBJECTIVES

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

- state types of statistics
- state how statistical data is collected
- define variables and state the types of variables
- state how data is measured
- describe how to choose a correct statistical test.

3.0 MAIN CONTENT

3.1 Uses and Types of Statistics

According to the American Statistical Association (2010), statistics is the scientific application of mathematical principles to the collection, analysis, and presentation of numerical data. This simply means that statistician or anyone applying a statistical procedure does three major things, which are:

1. Collection of data
2. Analysis of data
3. Presentation of data

Hence, statistics is mainly aimed at examining whether the research data supports the hypothesis raised by the researcher. This is usually aimed at reaching conclusions and making decisions with the obtained information.

Uses of Statistics

1. Statistics is used for research purposes
2. Statistics is used for data collection
3. Statistics is used for data analysis
4. Statistics is used for data interpretation
5. Statistics is used to identify general principles
6. Statistics is used to draw conclusion from data
7. Statistics is used to summarise information in order to aid understanding
8. Statistics is used to estimate the present and predict the future
9. Statistics is used to write projects, journals, textbooks and international conference papers
10. Statistics is used to show the degree of association or relation between two or more variables
11. Statistics is used to assess behavioural outcomes
12. Statistics is to make extrapolations

Types of Statistics

1. **Descriptive Statistics:** This organises describes and, summarises quantitative data. According to Aboh and Obidigbo (1998), descriptive statistics are used in everyday language. Descriptive includes measures of variability or dispersion like standard deviation, variance, and mean deviation; measures of central tendency: mean, median and mode; measures of distribution shape, charts and graphs: skewness (which measures asymmetry, +ve or right and –ve or left skewed) and kurtosis (which measures peakness of the probability distribution of a real-valued random variable).

2. **Inferential Statistics:** Inferential statistics are used in making inferences about the entire population from the findings on a sample (Aboh & Obidigbo, 1998). Furthermore, it is used to determine whether changes in a dependent variable are caused by the manipulations of an independent variable. By studying a carefully selected sample of Nigerian speakers of English, we can arrive at some generalizations about the nature of Nigerian English. This is normally derived using statistical significance principle. It performs predictive, estimation and generalisation functions. Descriptive statistics allows us to answer questions of the type "is there a difference…?", "Is there a relationship…?" These questions require the parametric and non-parametric statistical techniques.

3.2 Collection of Statistical Data

DATA: This is a collection of facts from which a conclusion may be drawn (facts might be about people, other subjects or events). *Data* is the plural form of the singular word *datum*. Data are numbers that have some meaning – the numbers might represent age, sex, exam marks, height, volume or indeed almost anything.

Data Collection

Data are collected among other methods by:

1. Experimentation – Laboratory experiment

- Field experiment
- Natural experiment

2. Observation and Survey methods
   Observation – Controlled observation

- Naturalistic observation
- Participant observation

Surveys- Questionnaires

- Interviews

3. Case study methods

Population

Population refers to the total number of all possible cases from which a sample is drawn. It is a group of individuals who share certain characteristics such as students, teachers, measurement results etc. Population simply refers to people, events, animals, things or objects (all the possible unit or elements) who or which are used in studies as defined by the aims and objectives of the researcher.

NOTE: the type of study one undertakes determines the population of interest.

Sample

A sample is a representative of an entire population. It refers to a group of subjects selected from a population of interest and which must be representative of the whole population. Any given sample can be part of more than one population.

For a sample to be representative, we use various techniques:

1. Probability Sampling

For instance:

- Simple random sampling
- Systematic random sampling
- Stratified random sampling
- Cluster sampling

2. Non Probability Sampling

For instance:

- Accidental sampling
- Purposive sampling
- Quota sampling

3.3 Variables

A variable refers to an event, behaviour, condition or characteristic that has two or more values. It equally refers to factors that can be varied such as age, gender, height, student, noise, colour, and so on. There are three major types of variables.

Independent Variable (IV or X): This is the variable that is selected, manipulated and controlled by the experimenter. The /h/ sound may be selected for the analysis of the speech of segments of the Nigerian speakers of English.

Dependent Variable (DV or Y): This is the measurable variable and must often depend on the manipulation of the independent variable. The different realisations of the /h/ sound may be measured.

Secondary Variables (SV): These are extraneous or concomitant variables that confound an experiment. Such as participant variable: IQ, age, hearing, motivation etc; situational variable: experimenter effect, lack of standard instructions, testing conditions.

NOTE: The number and types of variables you choose determines the statistics you use.

Hypotheses

A hypothesis is a testable prediction about the relationship between two or more events, characteristics or variables. It also consists of a specific potential explanation for the occurrence of an event.

An experimental hypothesis must:

- potentially provide a relevant answer to the specific question
- be stated as clearly; as simply as possible
- be capable of being directly supported or unsupported by the results of an experiment

Types of hypotheses

- **Directional:** This makes statements that point towards a given direction
- **Non-directional:** This makes a statement that does not point towards a given direction. The direction is not stated. This is subdivided into two types:

1. **Alternate:** Involves making prediction that the independent variable would have an effect on the dependent variable
2. **Null:** Involves making prediction that the independent variable would have no effect on the dependent variable

Testing Hypotheses: Research results are statistically tested using critical regions. One tailed test normally go with directional hypothesis while two tailed tests normally employ non-directional hypothesis (HO & HI).

Decision Error

In making a decision about the null hypothesis HO, two types of error may be committed.

- An alternative (HI) may be accepted in making a decision about the null hypothesis when the null hypothesis (HO) is true. This is called a type I error.
- The null hypothesis (HO) may be accepted when an alternative (HI) is true. This is called a type II error.

	HO is true	HI is true
Accept HI	Type I error	Correct Decision
Accept HO	Correct decision	Type II Error

Degrees of Freedom

Degree of Freedom (DF) represents the number of free choices one has in each instance. It is normally derived using: DF=N-1(or number specified by the specific statistical technique).

Level of Significance

Researchers usually decide what odds they are prepared to accept when deciding whether the results of an experiment are significant. This is also called the significant level or critical level and it simply tells us the level of certainty at which something may or may not happen. It tells us whether our result is true or false (accepted or rejected). For instance, <0.05 Level of significance means that the level of probability that the result obtained is caused by chance is less than 5% right, that is 5/100, therefore 95% right which means that the probability (likelihood) of getting the same answer is 95% if repeated (compare 0.01=99%: 0.001=1000%).

NOTE:

1. The power of a statistical test increases as the significant level increases
2. The power of a test increases with sample size
3. Parametric tests are generally more powerful than non-parametric tests because of the assumptions that underlie their application**.**

3.4 Measurement of Data

Data are fact used in statistical calculation. They are usually collected from population or sampled groups and are collected using a scale. Data are usually classified into four basic types based on their measuring scale namely, **Nominal, Ordinal, Interval, and Ratio** – they are abbreviated as **NOIR**. Each of these is explained below.

- **Nominal:** Nominal data are obtained with nominal scales. Nominal scales place people and objects into categories. They classify or label individuals into different kinds such as male-female, true – false, yes-no etc The Nominal scales is a naming scale (from the word "name").

- **Ordinal:** This indicates the relative magnitude of scores. It does not indicate exact magnitude. The ordinal scale indicates rank position but does not tell how far apart the distance is. It orders data. For instance, 1st, 2nd, 3rd.

- **Interval:** This indicates the exact magnitude of scores but does not indicate their ratio to one another. It contains order and equal interval property, for example, the Likert type scales.

- **Ratio:** This shows the ratio of scores to one another and has a real or absolute zero. It contains all the attributes of the interval scale.

NOTE: Nominal data at times are called qualitative data because they represent the category to which an individual/participant belongs. Ordinal, interval and ratio data are seen as quantitative because they deal more with numbers.

Summary Table of Scales of Measurement

SCALE LEVEL	SCALE MEASUREMENT	SCALE QUALITIES	EXAMPLES	STATISTICS USED WITH
1.	NOMINAL	None/Identity	Names, lists of words	Mode, cross tabulation with chi square, etc
2.	ORDINAL	Magnitude (order from smaller to higher)	Likert scale, anything rank ordered	Median, mode, rank order, correlation, non-parametric statistics, etc
3.	INTERVAL	Identity, magnitude, equal intervals (equidistance)	Temperature, IQ	Mean, standard deviation, regression, ANOVA, factor analysis, multivariates, etc.
4.	RATIO	Identity, magnitude, equal interval (distance), true/absolute zero	Age, height, weight, percentage	Parametric, same as for interval.

Continuous and Discontinuous Data

Nominal and ordinal data assumes only specific values and they are usually determined by condition. They are referred to as **discrete or discontinuous data**. Interval and ratio accommodate any value within any defined range of values. They are not determined by counting and can have an infinite or unaccountable number of intermediate values hence they are referred to as **continuous data**.

3.5 Choosing the Correct Statistical Test

To choose the correct statistical test, you must consider the following.

1. What kind of design did you employ (same subjects/ within subjects/related designs/ repeated measures or different/between/ /unrelated subjects)?
2. What are the number and levels of variables you manipulated and/or measured (how many IVs, how many DVs and how many SVs)?
3. What type of data did you collect (nominal, ordinal, interval or ratio)?
4. What do you wish to look for amongst your variables (relationship, association or differences)?

Parametric (P) Statistical Tests

Assumptions:

1. Involves interval/ratio scale
2. Homogeneity of variance (variability of scores from each condition should be the same)
3. Normal distribution of population
4. Independence of groups
   Descriptive Statistics for parametric tests are usually mean and standard deviation

Non- Parametric (NP) Statistical Tests

Assumptions:

1. Involves ordinal/nominal data
2. Heterogeneity (no homogeneity) of variance
3. Sample is from an abnormal population (distribution-free test)
4. Usually takes ranking into cognizance
   Descriptive Statistics for non-parametric test are usually median and range.

Variance: measure of how spread out a distribution is from the mean or the degree to which scores on a variable differ from each other. If every score on the variable were about equal, the variable would have little spread (variability and dispersion are synonym for spread). Spread is statistically measured by range, semi-inter-quartile range, variance, standard deviation and mean deviation.

NOTE: Homogeneity of variance means even spread out of the distribution from the mean.

Table of Basic Inferential Statistical Tests

S/NO	PARAMETRIC STATISTICS	NON PARAMETRIC STATISTICS
One Sample Test		
1	One Sample T – Test	Chi Square Test (Goodness of Fit) Kolmogrov – Smirnov test
T Tests/Two Samples Tests		
2	Independent T- Test	Mann-Whitney U Test
3	Dependent T- Test	Wilcoxon Matched Pairs Signed Rank Test
Tests of correlations/Two Samples Test		
4	Pearson Product Moment Correlation Coefficient	Spearman Rank Order Correlation Coefficient
Analysis Of Variance (ANOVA)/Three Samples or More Test		
5	One way ANOVA (unrelated)	Kruskal-Wallis H - test
6	One way ANOVA (related) / repeated measures ANOVA	Friedman test

4.0 CONCLUSION

In this unit, we have been able to describe what statistics is and state the types of statistics. We have also been able to state how statistical data is collected, and we went further by defining variables and stating the types of variables. We were also able to state how data is measured and describe how to a correct statistical test is chosen. It is expected that students acquaint themselves with these procedures in order to be grounded in research.

SELF-ASSESSMENT EXERCISE

1. Explain what we mean by inferential statistics and state two types of statistics under it
2. What are extraneous variables and how are they controlled?

5.0 SUMMARY

In this unit, we have discussed:

- types of statistics
- how statistical data is collected
- how variables are defined and the types of variables
- how data is measured
- how to choose a correct statistical test.

6.0 TUTOR-MARKED ASSIGNMENT

1. With appropriate examples, state how statistical data is collected.
2. With appropriate examples, describe the four scales of measurement.
3. Describe we can choose a correct statistical test.

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UNIT 2 PARAMETRIC STATISTICAL PROCEDURES

CONTENTS

1.0 INTRODUCTION

Parametric statistical tests involves data that are in interval/ratio scale, homogeneity of variance (variability of scores from each condition should be the same), the normal distribution of population and independence of groups hence it uses mean and standard deviation as descriptive statistics.

2.0 OBJECTIVES

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

- calculate One-Way Analysis of Variance
- calculate the T – Test Statistics: Tests of Difference for Two Samples
- calculate Tests of Correlation.

3.0 MAIN CONTENT

3.1 One-Way Analysis of Variance

The t-test is used to compare the difference between two-sample means. This simply means that the t-test is most appropriate for studies in which there are only two samples but at times, there are researches that demands more than two samples. For instance, there could be a study to measure the effect of four different types of parental occupation in the language behavior of students. To conduct this kind of a study, the ANOVA is usually used. The ANOVA is like an extension or expansion of the t-test because it compares the means of more than two samples. ANOVA was developed by Ronald Fisher in 1918. The ANOVA statistics has different variations with regards to grouping variables. For

instance, in one-way ANOVA, we have just one independent variable with different levels and in two-way ANOVA, we have two independent variables with different levels while in three-way ANOVA, we have three different variables with three different levels.

In the ANOVA nomenclature, the ways are made up of levels. For instance, when one conducts a one-way ANOVA, such a person has different levels in the 'way' and this could be two, three, four or more. In addition, it is important to note that it is the convention for researchers to state the number of levels in a 'way.' For instance, a 7 x 5 x 3 ANOVA here means a three-way ANOVA with three different variables and each having different levels. The first has seven levels, the second, five levels and the third variable has three levels.

ANOVA allows us handle the data from experiments that have designs involving more than two conditions. ANOVA also allows us investigate the effect of more than one independent variable.

ANOVA enables us check the interaction effect between variables.

Description of ANOVA Designs
When describing ANOVA designs, we need to specify three things.

1. How many factors are involved in the design?
2. How many levels are there of each factor?
3. Whether each factor is a within or between subject factor

NOTE: Main effect is used to describe the independent effects of a factor while an interaction assesses the combined effect of the factors.

One-Way ANOVA (Between Subjects)

This is used when a single variable is tested under three or more conditions and different subjects are used for each of the conditions. This is the parametric equivalent of Kruskal-Wallis for example, **"**The Effect of the Presentation Rate of Information on Recall Ability."

One-Way ANOVA (Within Subjects)

This is used when a single variable is tested under three or more conditions and the same subjects are used for all the experimental conditions. This is a parametric counterpart of Friedman.

For the purpose of this discourse, we shall be focusing our attention on the one-way analysis of variance. However, it is important to note that once the calculation is conducted and a significant ratio is obtained or

the null hypothesis is rejected, a post-hoc test (which is Latin for 'after the fact') is applied to determine the source of the significance, that is, which of the groups is significantly different from each other.

One-Way Analysis of Variance

The following are data obtained for the effect of four different types of over learning in a language class (Group 1 = 2 hours; Group 2 = 4 hours; Group 3 = 6 hours; Group 4 = 8 hours) on the recall of nonsense syllables among four different groups of participants.

S/no [Subjects]	Condition1 [Gp. 1 = 2Hrs]	Condition 2 [Gp. 2 = 4Hrs]	Condition 3 [Gp. 3 = 6Hrs]	Condition 4 [Gp. 4 = 8Hrs]
1	24	18	15	18
2	21	24	22	22
3	17	18	23	24
4	19	22	12	18
5	15	17	19	11
6	23	16	15	17
7	22	18	13	16
8	18	12	18	18
9	15	14	11	18
10	13	11	9	14
11	17	18	23	12
12	22	18	13	18

At $P<0.05$ level of significance, test the difference between means using a non-directional hypothesis on the on the effect of over learning on the recall of nonsense syllables.

One-Way Analysis of Variance Calculation

Decision Rule

Reject HO and accept HI if F calculated value is found to be EQUAL TO or GREATER THAN the F critical value at $P\leq 0.05$ level of significance.

Calculation

S/no [Subjects]	Condition1 [Gp. 1 = 2Hrs]	Condition 2 [Gp. 2 = 4Hrs]	Condition 3 [Gp. 3 = 6Hrs]	Condition 4 [Gp. 4 = 8Hrs]
1	24	18	15	18
2	21	24	22	22
3	17	18	23	24
4	19	22	12	18
5	15	17	19	11
6	23	16	15	17
7	22	18	13	16
8	18	12	18	18
9	15	14	11	18
10	13	11	9	14
11	17	18	23	12
12	22	18	13	18
Total	226	206	193	206
Means	$X1$ = 18.83	$X2 = 17.17$	$X = 16.08$	$X = 17.17$

NOTE: There are nine steps of calculations done in the One Way ANOVA unrelated

1. Sum of Squares Between [SSB_{etween}]
2. Sum of Squares Total [SST_{otal}]
3. Sum of Squares Error [SSE_{rror}]
4. Degree of Freedom Between [dfB_{etween}]
5. Degree of Freedom Total [dfT_{otal}]
6. Degree of Freedom Error [dfE_{rror}]
7. Mean Square Between
8. Mean Square Error
9. F - Ratio

$$\Sigma T^2 = 226^2 + 206^2 + 193^2 + 206^2$$

n = 12

N = 48

$$(\Sigma x)^2 = 831^2 = 690561$$

$$\frac{(\Sigma x)^2}{N} = \frac{381^2}{48} = \frac{690561}{48} = 14386.69$$

1. Sum of Squares Between (SSB_{etween}) =
$$\frac{(\Sigma T)^2}{n} - \frac{(\Sigma x)^2}{N} = \frac{173197}{12} - \frac{690561}{48}$$
= 14433.08 – 14386.69
= 46.39

2. Sum of Squares Total (SST_{otal}) = $\Sigma x^2 - \frac{(\Sigma x)^2}{N}$

= 24^2 +21^2+ 17^2 + 19^2 + 15^2 + 23^2 + 22^2 + 18^2 + 15^2 + 13^2 + 17^2 + 22^2 + 18^2 + 24^2 + 18^2 + 22^2 + 17^2 + 16^2 + 18^2 + 12^2 + 14^2 + 11^2 + 18^2 + 18^2 + 15^2 + 22^2 + 23^2 + 12^2 + 19^2 + 15^2 + 13^2 + 18^2 + 11^2 + 9^2 + 23^2 + 13^2 + 18^2 +24^2+ 18^2 + 22^2 + 17^2 + 16^2 + 18^2 + 11^2 + 18^2 + 14^2 + 12^2 + 18^2 = 15129

= 15129 – 14386.69
= 742 . 31

3. Sum of Squares Error (SSE_{rror}) = $SST_{otal} - SSB_{etween}$
= 742.31 – 14386. 69
= 695.92

Degrees of Freedom

4. $dfB_{etween} = C_{onditions} - 1$
$dfB_{etween} = 4 - 1$
= 3

5. $dfT_{otal} = N - 1$
$dfT_{otal} = 48 - 1$
= 47

6. $dfE_{rror} = dfT_{otal} - dfB_{etween}$
$dfE_{rror} = 47 - 3$
= 44

Mean Squares

7. $$MSBetween = \frac{SSBetween}{dfBetween} = \frac{46.39}{3} = 15.465$$

8. $$MSError = \frac{SSError}{dfError} = \frac{695.92}{44} = 15.81$$

F - ratio

9. $$Fratio = \frac{MSBetween}{MSError} = F_{3,44} = \frac{15.465}{15.81} = 0.98$$

Decision

Since the F calculated value of 0.98 is less than the F critical value of 2.84, at $P \leq 0.05$, the null hypothesis HO is accepted and the alternate hypothesis HI is hereby rejected, based on the assumption that the calculated value should be greater than or equal to the critical value for a significant value to be obtained.

Summary Table

Title: Summary table of One-Way ANOVA on the effect of over learning on the recall of nonsense syllables

Source of Variance	Sum of Squares	Degree of Freedom	Mean Squares	F ratio
Over learning	46.39	3	15.465	$F_{3,44} = 0.98$
Error	742 . 31	47	15.81	
Total	695.92	44		

3.2 T-Test Statistics: Tests of Difference for Two Samples

T- test is a parametric test used to determine whether two means are significantly different from one another. For instance, when an experimenter wants to examine the difference between two means or the means of scores obtained by several participants, the t-test is the statistics of choice. For instance, in a study to measure the effect of family background on language development, one may examine two groups of participants i.e. people from good family background and people from not so good family background and test them on language development. The calculated difference between the means obtained by the two sets of samples is what is known as the **t-test score**. This could be a test of difference between a sample and a criterion score, between two dependent samples of between two independent samples. The t-test statistical procedures are parametric, that is, the meet the assumptions outlined above for parametric statistical tests.

There are three types of T-test

1. T- test for one sample
2. Independent t-test (ITT) - for different subjects or two samples
3. Dependent t-test (DT) - for same group or subjects

When to Use T-Test

One Sample: Use with one subject tested under one experimental condition and then compared with an established norm such as a given population mean.

Dependent T-Test: This is used when the same or one group of subjects are tested under two experimental conditions testing one independent variable , that is, measurement is repeated for a given group of subjects on both conditions.

OR

Two independent groups of subjects tested under one condition that is pair wised or matched subject by variables.

NOTE: Wilcoxon is the non-parametric counterpart of this.

- In PROJECTS, experimental and control group are matched, that is, measured before or after or pretest-posttest.
For example: The effect of anti-rally film on the rallying behavior of undergraduate protesters

Independent T-Test: Used for experimental designs with two conditions testing one independent variable, when different subjects are doing the two conditions.

NOTE: - Two groups tested under one condition
- Two groups tested under two conditions - experimental and control groups
- Mann –Whitney –U test is the non-parametric equivalent of this.

For example: The effect of simple and complex text on recall ability

- The effect of alcohol on handball playing

Independent T-Test

The following are data obtained for two samples of subjects under two experimental conditions:

Sample A	22	24	18	19	29	26	20	17	14	18
Sample B	20	22	13	16	18	12	19	10	9	14

At P<0.05 level of significance, test the difference between means using a non-directional hypothesis on the effect of breakfasting on the reaction time of students.

Decision Rule

Reject HO and accept HI if t calculated value is found to be EQUAL To or GREATER THAN the t critical value at P≤ 0.05 level of significance. df = *n1 + n2 - 2.*

Calculation

S/no	**X1**	**$X1^2$**	**X2**	**$X2^2$**
1	22	484	20	400
2	24	576	22	484
3	18	324	13	169
4	19	361	16	256
5	29	841	18	324
6	26	676	12	144
7	20	400	19	361
8	17	289	10	100
9	14	196	9	81
10	18	324	14	196
	$\Sigma X1 = 207$	$\Sigma X1^2 = 4471$	$\Sigma X2 = 153$	$\Sigma X2^2 = 2515$
	N1 = 10	N2 = 10	$\bar{X}1 = 20.7$	$\bar{X}1 = 15.3$

$$t = \frac{\bar{X}1 - \bar{X}2}{\sqrt{\frac{\left[\Sigma X1^2 - \frac{(\Sigma X1)^2}{n1}\right] + \left[\Sigma X2^2 - \frac{(\Sigma X2)^2}{n2}\right]}{n1 + n2 - 2}\left[\frac{1}{n1} + \frac{1}{n2}\right]}}$$

$$t = \frac{20.7 - 15.3}{\sqrt{\frac{\left[4471 - \frac{(207)^2}{10}\right] + \left[2515 - \frac{(153)^2}{10}\right]}{10 + 10 - 2}\left[\frac{1}{10} + \frac{1}{10}\right]}}$$

$$t = \frac{5.4}{\sqrt{\frac{\left[4471 - \frac{42849}{10}\right] + \left[2515 - \frac{23409}{10}\right]}{10 + 10 - 2}[0.2]}}$$

$$t = \frac{5.4}{\sqrt{\frac{186.1 + 174.1}{18}[0.2]}}$$

$$t = \frac{5.4}{\sqrt{\frac{360.2}{18}[0.2]}}$$

$$t = \frac{5.4}{\sqrt{20.01 \times 0.2}}$$

$$t = \frac{5.4}{\sqrt{4.0}}$$

$$t = \frac{5.4}{2.0}$$

$$t = 2.7$$

Decision

Since the t calculated value of 2.7 is greater than the t critical value of 2.101, at P ≤ 0.05, the null hypothesis HO is rejected and the alternate hypothesis HI is hereby accepted, based on the assumption that the calculated value should be greater than or equal to the critical value for a significant value to be obtained.

Summary Table

Title: Summary table of independent t-test on the effect of breakfasting on reaction time.

N1	N2	$\bar{X}1$	$\bar{X}2$	T	P
10	10	20.7	15.3	2.7	≤ 0.05

Dependent /Matched T-Test

The following are paired measurements obtained for two groups of participants on the effect of HIV/AIDS sensitisation on the sexual attitude of undergraduate students:

s/no	1	2	3	4	5	6	7	8	9	10
X	20	18	23	15	29	25	20	17	24	28
Y	17	14	13	11	21	16	12	10	19	24

At P<0.05 level of significance, test the difference between means using a non-directional hypothesis on the effect of HIV/AIDS sensitisation on the sexual attitude of undergraduate students.

Decision Rule

Reject HO and accept HI if t calculated value is found to be EQUAL To or GREATER THAN the t critical value at P≤ 0.05 level of significance. df = *N – 1.*

Calculation

S/no	X1	Y2	D	d^2
1	20	17	3	9
2	18	14	4	16
3	23	13	10	100
4	15	11	4	16
5	29	21	7	49
6	25	16	9	81
7	20	12	8	64
8	17	10	7	49
9	24	19	5	25
10	28	24	4	16
			$\Sigma d = 61$	$\Sigma d^2 = 425$

$$t = \frac{\Sigma d}{\sqrt{\frac{N\Sigma d^2 - (\Sigma d)^2}{N-1}}}$$

$$t = \frac{61}{\sqrt{\frac{10\ x\ 425 - (61)^2}{10-1}}}$$

$$t = \frac{61}{\sqrt{\frac{4250 - 3721}{9}}}$$

$$t = \frac{61}{\sqrt{\frac{529}{9}}}$$

$$t = \frac{61}{\sqrt{58.78}}$$

$$t = \frac{61}{7.6}$$

$$t = 8.03$$

Decision

Since the t calculated value of 8.03 is greater than the t critical value of 2.262, at P ≤ 0.05, the null hypothesis HO is rejected and the alternate hypothesis HI is hereby accepted, based on the assumption that the

calculated value should be greater than or equal to the critical value for a significant value to be obtained.

Summary Table

Title: Summary table of dependent t – test on the effect of HIV/AIDS sensitisation on the sexual attitude of undergraduate students.

N	Σd	Σd^2	T	P
10	61	425	8.03	≤ 0.05

3.3 Tests of Correlation

Correlation measures the degree of relationship or association scores between two variables. It is possible to measure whether family background has anything to do with reading preferences of students. It is measured on a scale running from +1(perfectly positive correlation) through 0 (no correlation) down to – 1(perfect negative correlation) +1 to 0 to – 1.

Correlation measures:

- whether or not a relationship exist
- strength of that relationship
- degree of that relationship
- direction of the relationship.

Descriptive: The descriptive statistics for correlation is usually scattergram or scatterplots.

Pearson's R (Parametric)

This is used when paired measurements are obtained from the same group of subjects or matched samples on two variables that arte linearly related.

For example:

1. The relationship between attending research training classes and project score or research skill/literacy.
2. Comparative analysis of undergraduate students' performance on two related core English and Literary studies courses.
3. The relationship between the scoring of two judges on the performance of 10 students in a debate competition.

Pearson Product Moment Correlation Coefficient

The following are paired measurements:

X	24	23	32	30	26	28	27	36	33	29
Y	21	19	27	29	22	26	24	33	30	27

At P<0.05 level of significance, show if there is any significant relationship between competence and performance in linguistic knowledge, using a non directional hypothesis.

Decision Rule

Reject HO and accept HI if *r* calculated value is found to be GREATER THAN or EQUAL TO the *r* critical value at P≤ 0.05 level of significance. df = *N - 2.*

Calculation

S/no	X	Y	X^2	Y^2	XY
1	24	21	576	441	504
2	23	19	529	361	437
3	32	27	1024	729	864
4	30	29	900	841	870
5	26	22	676	484	572
6	28	26	784	676	728
7	27	24	729	576	648
8	36	33	1296	1089	1188
9	33	30	1089	900	990
10	26	27	841	729	783
	X = 288	Y = 258	X^2 = 8444	Y^2= 6826	XY = 7584

$$r = \frac{N\Sigma XY - \Sigma X\Sigma Y}{\sqrt{[N\Sigma X^2 - (\Sigma X)^2][N\Sigma Y^2 - (\Sigma Y)^2]}}$$

$$r = \frac{10\ x7584 - 288\ x\ 258}{\sqrt{[10\ x\ 8444 - (288)^2][10\ x\ 6826 - (258)^2]}}$$

$$r = \frac{75840 - 74304}{\sqrt{[84440 - 82944][68260 - 66564]}}$$

$$r = \frac{1536}{\sqrt{1496\ x\ 1696}}$$

$$r = \frac{1536}{\sqrt{2537216}}$$

$$r = \frac{1536}{1592.86}$$

$$r = 0.964$$

Decision

Since the *r* calculated value of 0.964 is greater than the *r* critical value of 0.6319 at P ≤ 0.05, the null hypothesis HO is rejected and the alternate hypothesis HI is hereby accepted based on the assumption that the calculated value should be greater than or equal to the critical value for a significant value to be obtained.

Summary Table

Title: Summary table of Pearson Product Moment Correlation on the relationship between competence and performance in linguistic knowledge

N	*R*	P
10	0.964	≤ 0.05

4.0 CONCLUSION

In this unit, we have been able to describe and calculate the one-way analysis of variance. We have also been able to describe and calculate the T – test statistics as well as tests of correlation. These tests are important test in linguistic and literary research. For students who desire to specialise in Sociolinguistics or Psycholinguistics, these statistical tools are critical.

SELF-ASSESSMENT EXERCISE

1. When do we use analysis of variance?
2. When do we apply the t-test statistics?

5.0 SUMMARY

In this unit, we have discussed:

- analysis of variance

- t – tests
- tests of correlations.

6.0 TUTOR-MARKED ASSIGNMENT

1. Use the data set for Kruskal Wallis below for ANOVA calculation.
2. Apply Pearson Product Moment Correlation Coefficient to the data used in calculating Spearman below.
3. Apply Independent t-test to the Mann Whitney u-test data below.

7.0 REFERENCES/FURTHER READING

Aboh, U. J. & Obidigbo, G. C. (1998). *Quantitative Analysis in Psychology*. Enugu, Nigeria: Eddymore.

Bryman, A. (2008). *Social Research Methods*. UK: Oxford University Press.

Fielding, J. & Gilbert, N. (2006). *Understanding Social Statistics* (2nd ed.). London: Sage.

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UNIT 3 NON PARAMETRIC STATISTICAL PROCEDURES

CONTENTS

1.0 INTRODUCTION

Non-parametric statistical tests involves data that involves ordinal/nominal data, heterogeneity (no homogeneity) of variance, sample from an abnormal population (distribution-free test), usually takes ranking into cognizance and uses median and range as its descriptive statistics.

In this unit, we shall learn how to apply these processes.

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2.0 OBJECTIVES

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

- Kruskal Wallis H Test /One Way ANOVA by Ranks
- Mann-Whitney and Wilcoxon's Test
- a Wilcoxon's Matched Pairs Signed Rank Test
- Spearman Rank Order Correlational Coefficient.

3.0 MAIN CONTENT

3.1 Kruskal Wallis H Test /One-Way ANOVA by Ranks

Used for unrelated designs when different subjects are used for three or more conditions.

Example: Effect of different three types of moral teaching on the examination behaviour of students.
The following are paired measurements obtained for three groups of participants on the effect of three different types of noise levels on the recall ability of three different samples of subjects tested under three different experimental conditions:

s/no	1	2	3	4	5	6	7	8	9	10	11	12
Condition 1	13	18	14	19	17	8	9	17	19	16	14	10
Condition 2	12	10	19	8	15	13	10	17	11			
Condition 3	13	15	12	10	11	19	17	15	10	11	18	

At P<0.05 level of significance, test the difference between means using a non-directional hypothesis on the effect of three different types of noise levels on the recall ability of three different samples of subjects tested under three different experimental conditions.

Decision Rule

Reject HO and accept HI if H calculated value is found to be EQUAL TO or GREATER THAN the H critical value at P≤ 0.05 level of significance.

Calculation

S/no [Subjects]	Condition 1	Rank 1	Condition 2	Rank 2	Condition 3	Rank 3
1	13	15	12	12.5	13	20
2	18	27.5	10	6	15	15
3	14	17.5	19	30.5	12	12.5
4	19	30.5	8	1.5	10	6
5	17	24.5	15	20	11	10
6	8	1.5	13	15	19	30.5
7	9	3	10	16	17	24.5
8	17	24.5	17	24.5	15	20
9	19	30.5	11	10	10	6
10	16	22			11	10
11	14	17.5			18	27.5
12	10	6				

Total		ΣT_1= 220		ΣT_2= 126		ΣT_3= 182

$$H = \left[\frac{12}{N\,(N+1)} \sum \frac{T}{n}\right.$$

$$H = \left[\frac{12}{32\,(32+1)}\left(\frac{220^2}{12} + \frac{126^2}{9} + \frac{182^2}{11}\right)\right] - 3\,(32+1)$$

$$H = \left[\frac{12}{N\,(N+1)} \sum \frac{T^2}{n}\right] - 3\,(N+1)$$

$$H = \left[\frac{12}{1056}\left(\frac{48400}{12} + \frac{15876}{9} + \frac{33124}{11}\right)\right] - 99$$

$$H = [0.0114\,(4033.33 + 1764 + 3011.27)] - 99$$

$$H = [0.0114\ x\ 8808.6] - 99$$
$$H = 100.42 - 99$$
$$H = 1.42$$
$$df = C_{(condition)} - 1$$
$$= 3 - 1$$
$$df = 2$$

Decision

Since the H calculated value of 1.42 is less than the H critical value of 5.6600, at P ≤ 0.051, the null hypothesis HO is accepted and the alternate hypothesis HI is hereby rejected, based on the assumption that the calculated value should be greater than or equal to the critical value for a significant value to be obtained.

Summary Table

Title: Summary table of Kruskal – Wallis H Test on the effect of noise level on the recall ability of students

N	n	C	H	P
32	12, 9, 11	3	1.42	≤ 0.051

3.2 Mann-Whitney and Wilcoxon's Test

These are non-parametric tests that tests whether the means of two samples are different. Ranking takes place and calculations are carried out on the ranks.

NOTE: The median and the range are normally the descriptive statistics that follows them as the measures of central tendency and dispersion. This is because NP is a distribution free-test and do not assume normal distribution.

WILCOXON MATCHED PAIRS SIGNED RANK TEST (NP equivalent of DTT): Used for a related design when the same subjects are used in two conditions, that is, for data from repeated measures and matched pairs design.

Example: The effect of preparation training on ICAN performance.
The effect of noise on learning (condition/gp 1, noise & condition/gp 2, no noise or before and after).

Mann-Whitney U Test (NP equivalent of ITT): Used when different subjects are used in two conditions that is, data from unrelated group or independent group design.

Example: The effect of course outline on academic performance (2 groups: gp1, course outline & gp 2 no course outline).

Mann - Whitney U Test

The following are data obtained for two samples of subjects under two experimental conditions:

Sample A	9	7	6	8	4	3	5	5	3	2
Sample B	7	6	8	8	9	4	4	3	2	6

At $P<0.05$ level of significance, using a non parametric statistical procedure, test the difference between means using a non-directional hypothesis on the on the effect of course outline on academic performance of students.

Decision Rule

Reject HO and accept HI if U calculated value is found to be EQUAL To or LESS THAN the U critical value at $P\leq 0.05$ level of significance. df = *n1/n2 [n1 by (under) n2]*.

Calculation

S/NO	Condition1	Rank 1	Condition 2	Rank 2
1	9	19.5	7	14.5
2	7	14.5	6	12
3	6	12	8	17
4	8	17	8	17
5	4	7	9	19.5
6	3	4	4	7
7	5	9.5	4	7
8	5	9.5	3	4
9	3	4	2	1.5
10	2	1.5	6	12
		R_1 = 98.5		R_2 = 111.5

$$U = n_1 n_2 + \frac{n_1(n_1 + 1)}{2} - R_1$$

$$U = 10\ x\ 10 + \frac{10(10 + 1)}{2} - 98.5$$

$$U = 100 + \frac{110}{2} - 98.5$$

$$U = 100 + 55 - 98.5$$
$$U = 56.5$$
$$U^1 = n1\ n2 - U$$
$$U^1 = 10\ X\ 10 - 56.5$$
$$U^1 = 100 - 56.5$$
$$U^1 = 43.5$$
$$U = 43.5$$

Decision

Since the U calculated value of 43.5 is greater than the U critical value of 23, at P ≤ 0.05, the null hypothesis HO is accepted and the alternate hypothesis HI is hereby rejected, based on the assumption that the

calculated value should be less than or equal to the critical value for a significant value to be obtained.

Summary Table

Title: Summary table of Mann – Whitney U test on the effect of course outline on academic performance

N1	N2	R_1	R_2	U	U_1	U	P
10	10	98.5	111.5	56.5	43.5	43.5	≤ 0.05

Wilcoxon's Matched Pairs Signed Rank Test

The following are paired measurement s obtained for two groups of participants on the effect of course of study (English Major Yr 1 and Mass Communication Yr 1) on performance in a university wide course (Use of English (ENG 111)).

s/no	1	2	3	4	5	6	7	8	9	10	11	12
X	18	16	10	18	10	12	19	14	17	13	12	14
Y	19	12	13	18	11	10	12	16	10	14	18	11

At P<0.05 level of significance, using a non parametric statistical procedure, test the difference between means using a non-directional hypothesis on the on the effect of course of study (English Major Yr 1 and Mass Communication Yr 1) on performance in a university wide course (Use of English (ENG 111)).

DECISION RULE

Reject HO and accept HI if W calculated value is found to be EQUAL TO or LESS THAN the W critical value at P≤ 0.05 level of significance.

Calculation

S/no	X	Y	D	Rank d	Rank d+ve	Rank d -ve
1	18	19	-1	-2		-2
2	16	12	+4	+8	+8	
3	10	13	- 3	-6.5		-6.5
4	18	18	0	0		
5	10	11	-1	-2		-2
6	12	10	+2	+4.5	+4.5	
7	19	12	+7	+10.5	+10.5	
8	14	16	-2	-4.5		-4.5
9	17	10	+7	+10.5	+10.5	

10	13	14	-1	-2		-2
11	12	18	-6	-9		-9
12	14	11	+3	+6.5	+6.5	
					$\Sigma d + ve =$ 40	$\Sigma d - ve = 26$

*The lesser W Rank value is taken as the calculated value

$W = 26$

Decision

Since the W calculated value of 26 is greater than the W critical value of 11, at $P \leq 0.05$, the null hypothesis HO is accepted and the alternate hypothesis HI is hereby rejected, based on the assumption that the calculated value should be equal to or less than the critical value for a significant value to be obtained.

Summary Table

Title: Summary table of Wilcoxon's Matched Pairs Signed Rank Test on the effect of course of study on performance in (English Major Yr 1 and Mass Communication Yr 1) in a university wide course (Use of English (ENG 111)).

N	df	W	P
12	11	26	≤ 0.05

.

3.3 Spearman Rank Order Correlational Coefficient

This is used when measuring the significance of a correlation between peoples score on variables that are linearly related.

Example:

1. The relationship between attending research training classes and project score or research skill/literacy.
2. Comparative analysis of undergraduate students' performance on two related core English and Literary studies courses.

The following are paired measurements:

X	48	46	30	38	40	30	43	45	28	23
Y	38	36	40	32	36	20	32	40	38	19

At P<0.05 level of significance, using a non parametric statistical procedure, show if there is any significant relationship between students performance in sound variation and syntactic variation language test conducted in the Language Laboratory of a Nigerian university, using a non directional hypothesis.

DECISION RULE

Reject HO and accept HI if r_s calculated value is found to be GREATER THAN or EQUAL To the r_s critical value at P≤ 0.05 level of significance. df = *N - 2.*

Calculation

S/no	X	Y	Rank X	Rank Y	D	d^2
1	48	38	10	7.5	+2.5	6.25
2	46	36	9	5.5	+3.5	12.25
3	30	40	3.5	9.5	-6	36
4	38	32	5	3.5	+1.5	2.25
5	40	36	6	5.5	+0.5	0.25
6	30	20	3.5	2	+1.5	2.25
7	43	32	7	3.5	+3.5	12.25
8	45	40	8	9.5	-1.5	2.25
9	28	38	2	7.5	-5.5	30.25
10	23	19	1	1	0	0

$$r_s = 1 - \frac{6(\sum d^2)}{N(N^2 - 1)}$$

$$r_s = 1 - \frac{6(104)}{10(10^2 - 1)}$$

$$r_s = 1 - \frac{624}{10(99)}$$

$$r_s = 1 - \frac{624}{990}$$

$$r_s = 1 - 0.6303$$

$$r_s = 0.37$$

Decision

Since the r_s calculated value of 0.37 is less than the r_s critical value of 0.643 at $P \leq 0.05$, the null hypothesis HO is accepted and the alternate hypothesis HI is hereby rejected, based on the assumption that the calculated value should be greater than or equal to the critical value for a significant value to be obtained.

Summary Table

Title: Summary table of Spearman Rank Order Correlation Coefficient on the relationship between students' performance in sound variation and syntactic variation language test conducted in the Language Laboratory of a Nigerian university.

N	$\sum d^2$	U	P
10	104	0.37	≤ 0.05

4.0 CONCLUSION

In this unit, we have been able to describe and calculate the Kruskal Wallis H Test /One Way ANOVA by Ranks, describe and calculate the Mann-Whitney and Wilcoxon's Test, describe and calculate the Wilcoxon's Matched Pairs Signed Rank Test and lastly describe and apply the Spearman Rank Order Correlational Coefficient. These are important statistical tools in Linguistic and Literary research and students are advised to master them.

SELF-ASSESSMENT EXERCISE

1. When do we apply Kruskal – Wallis H – Test?
2. When do we apply the spearman Rank Order Correlation Coefficient?

5.0 SUMMARY

In this unit, you have learnt the following:

- Kruskal Wallis H Test /One Way ANOVA by Ranks
- Mann-Whitney And Wilcoxon's Test
- Wilcoxon's Matched Pairs Signed Rank Test
- Spearman Rank Order Correlational Coefficient

6.0 TUTOR-MARKED ASSIGNMENT

1. Use the data set for ANOVA above and for Kruskal Wallis calculation.

2. Apply Spearman Rank Order Correlation Coefficient to the data used in Pearson Product Moment Correlation Coefficient above
3. Apply Mann Whitney U test to the Independent T-Test data above.

7.0 REFERENCES/FURTHER READING

Aboh, U. J. & Obidigbo, G. C. (1998). *Quantitative Analysis in Psychology*. Enugu, Nigeria: Eddymore.

American Statistical Association [2010]. What Is Statistics? Retrieved Thursday, 28th January, 2010 from http://www.amstat.org/careers/whatisstatistics.cfm

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MODULE 5 DOCUMENTATION AND REFERENCING AND THE PROCESS OF REVIEW OF LITERATURE

UNIT 1 DOCUMENTATION AND REFERENCING

CONTENTS

1.0 INTRODUCTION

Quite often, students on a research work with the mindset that information amassment is what research is all about. Thus, they copy verbatim other people's work to make their work voluminous. . This act is one of the worst academic crimes and it is called "plagiarism."

According to Gibaldi and Achtert (1998:21), "to plagiarise is to give the impression that you have written or thought something that you have in actual fact borrowed from someone else." This simply means that any representation of another person's work in any way is plagiarism and it attracts severe punishment ranging from expulsion to other fines.

This is why it is important only to mention one's ideas on a certain topic without citation but to mention other people's ideas with appropriate citation. Plagiarism is mostly observed in the academia where students copy other people's work verbatim. A situation where students copy project work from other universities and submit it as theirs is not new especially in developing countries. Interestingly, there are now manual and computer assisted methods of detecting plagiarism in materials computer assisted method. Among the computer assisted ones are Plagium, Plagiarism detector, and Plagiarism scanner.

In this unit, we shall be examining two major methods of citing other people's work used in research. We shall be focusing on the system developed by the Modern Language Association of America and that the one compiled by the American Psychological Association.

2.0 OBJECTIVES

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

- discuss and use the Classical method of referencing
- discuss and use the Modern Language Association (MLA) referencing and documentation style
- discuss and use the American Psychological Association (APA) referencing and documentation style.

3.0 MAIN CONTENT

3.1 The Classical Referencing Style

For the purpose of this discourse, we shall be referring to classical referencing method as the earlier methods used in referencing before different discipline evolved the discipline-specific writing styles. For instance, when we want to cite an author more than once in a page of a paper or many times on a particular paper, it looks repetitive, having to cite the name over again. Hence, these Latin phrases are used to avoid citing the same author or material again and again. However, the application of this method is discipline specific. It is allowed in Law and Philosophy among others.

These classical methods comprises of Latin terminologies and they, among others, include the following

1. Ibidem – abbreviated: ibid – as before/ditto
2. Opere Citato – abbreviated: op cit – work cited
3. Loco Citato – abbreviated: loc cit – place cited

1. IBIDEM – abbreviated: ibid

This is used when a writer wants to cite the same work. In fact, it literary means in the same place or in the same work or what has been previously mentioned.

Example

a) 2. C. Ogbulogo, *Concepts in Semantics*.(Lagos: Sam Iroanusi Publications, 2005), P. 9

b) 10. Ibid.
c) 14. Ibid., p.30

The above example simply means that the author is making the same reference he has made in number 2, in number 10 while number 14 also refers to the same material but in a different page number (30).

2. OPERE CITATO – abbreviated: op cit

This is used when the researcher or student cites the same author or material in different pages. When op cit is used, the reader turns to the footnotes or references to find the author's name and the cited material. This is used as a foot or endnote source found at the foot of the material just before the page number to refer to a citation made earlier.

Example

a) 2. Ogbulogo, Charles. *Concepts in Semantics*.(Lagos: Sam Iroanusi Publications, 2005), p. 5.
b) 15. Ogbulogo, op. cit., p. 12

The above example simply means that the same material referred to in 2 was also referred to in 15 with a different page number.

3. LOCO CITATO – abbreviated: loc Cit

Loco Citato or Loc .Cit. is used when the same material which follows sequentially have been referred to during the course of the work. i.e. when the citation is made from the same source and page number, loc. Cit. is used. Hence, loco citato means in the same place.

Example:

a) 7. Ogbulogo, Charles. *Concepts in Semantics*.(Lagos: Sam Iroanusi Publications, 2005) p. 19.
b) 9 Ogbulogo. C.Loc. cit. p. 65

The above example simply means that the loc. Cit. in reference 2 refers to everything in reference 7.

3.2 The Modern Language Association (MLA) Referencing Style

The MLA style is the document that outlines rules and style used especially in the humanities. It was developed by the Modern Language Association of America in 1985. The latest edition of its handbook, its

third, was published in 2008. The MLA handbook contains sections on research and writing, the mechanics of writing, the format of the research paper, preparing the list of works cited, documenting sources and abbreviation and reference words.

In the MLA style, researchers are expected to document the cited sources on the work cited list at the end of the material. The researcher is expected to supply the author's last name and page number. He is also expected to place the citation immediately after the work being cited and efforts should be made not to replicate the citation by citing the source and repeating the citation in parenthesis after the statement. Also, on-line materials are cited just like printed sources.

In Text Citations

S/n	**Author**	**Citation**
1	Author's name in text	According to Ogbulogo (10 - 11)
2	Author's name in two locations	Ogbulogo noted (15, 34 - 35)
3	Two or more authors	Ogbulogo and Igbokwe (14)
4	Corporate author	Covenant University (10)
5	Two or more works by the same author	Ogbulogo considers… (Linguistics, 9) Ogbulogo states… (Phonology, 3)
6	Bible	"… but skill will bring success" (Ecclesiastes. 10:10 TNIV)
7	A work with more than three authors	(Ogbulogo et al. 22)
8	A Poem is cited	In Charles Ogbulogo's poem "A song for Dede", he noted "It is not the time/ To pour libations/ And invite gluttons/ To massage distended bowels/ In vengeance to the tales of opulence" (lines 7 - 11)

S/n	Word	Abbreviation
1	No Publisher	N.p
2	No Pagination	n. pag.
3	Edited by, Edition or Editor	Ed or ed.
4	Months	Jan., Feb., Mar., Apr., Aug., Sept., Oct., Nov., Dec. Note: May, June and July are not abbreviated
5	No date	n. d.
6	Time	Afternoon: p.m. Morning: a.m. Year: yr Month: mo Week: wk

Abbreviations

MLA Reference Citation

1. Book

Ogbulogo, Charles (2005). *Concepts in Semantics*. Lagos: Sam Iroanusi Publications.

Ogbulogo, Charles (2005). *Igbo-English Medial Dictionary*. Lagos: Sam Iroanusi Publications.

2. Journal Article

Ogbulogo, Charles. "Computational Linguistics and the Study of Language in Nigeria", *International Journal of Curriculum Studies* 1. 2 (1999):89 – 107.

3. Newspaper or Magazine Article

Ogbulogo, Charles. "Issues in Language and Communication in Nigeria." *The Streams Magazine* 15 Mar. 2010: p3

4. Book Article or Chapter

Ogbulogo, Charles. "The Phonology of English." *The English Compendium.*

Ed. Fakoya, A. A. and S. Ogunpitan (2001). Lagos: Dept of English, Lagos State.

5. Encyclopedia Article

Ogbulogo, C. (2010). " Linguistics." *The New Encyclopedia of Knowledge*. 1st ed. Lagos: Light Publication.

6. Website Information

Ogbulogo, Charles. "Department of English and Literary Studies" Staff Profile. 2007. Covenant University. 7 Feb. 2010 http://www.covenantuniversity.com/colleges/chd/english/profiles/ogbulogo_charles.html.

7. Newspaper or Magazine Article on the Internet

Ogbulogo, Charles. "Issues in Language and Communication in Nigeria." The Light Magazine Jan. 2010: 3 – 6. 4 Feb 2010 http://www.charlesogbulogo.com/articles/downloads.html.

3.3 The American Psychological Association (APA) Referencing Style

The APA style is a set of rules for writing established by the American Psychological Association in 1929. The APA manual in its sixth edition is mostly used by the Social Sciences. The APA manual contains information on the ethics of research, reporting format, language, statistical analysis, electronic data presentation and publication process among others. The APA style interestingly offers online tutorials on its use.

APA RULES

In citing authors in APA format, the author's name separated by a coma and year of publication is usually written beside the cited sentence. However, when verbatim citation i.e. when the author's work is quoted verbatim, the page number is included after the year. The reference which is a compilation of all the cited materials is always put at the end of the research work. For single authors, the authors last or surname if followed by the year of publication is used. When two authors are cited within closed parenthesis, the ampersand sign (&) is used to separate them but if not enclosed within a parenthesis, the word 'and' is used. However, when there are three to five authors, the first reference to their work has all their names while subsequent references to the same material has only the first name and *et al*. when there are six authors or

more, the name of the first author appears with *et al*. in the whole document while at the reference section, all the names appear. When there are more than one publication by the same author in the same year, the author's name and year of publication appears followed by alphabets depicting the number of publications (for example, Ogbulogo, 2009a, 2009b, 2009c). When direct quotes are taken from a material, the author's name, year of publication and page number is cited.

Reference Citation

Book by One Author

Ogbulogo, C. (2005). Concepts in Semantics. Lagos: Sam Iroanusi Publications.

Ogbulogo, C. (2005). Igbo-English Medial Dictionary. Lagos: Sam Iroanusi Publications.

Chapter in an Edited Book

Ogbulogo, C. (2001). The Phonology of English. In A. A. Fakoya and S. Ogunpitan (Ed.), *The English Compendium*. Lagos: Dept of English, Lagos State.

Article in a Journal

Ogbulogo, C. (1999). Computational Linguistics and the Study of Language in Nigeria. *International Journal of Curriculum Studies* 1. (2), 89 – 107.

Article in a Magazine

Ogbulogo, C. (2010). Issues in Language and Communication in Nigeria. *The Streams Magazine* 15 Mar. 2010: p.3

Electronic Materials

Website Information

Ogbulogo, C. (2010). Department of English and Literary Studies" Covenant University Staff Profile. Retrieved on February 7, 2010 from http://www.covenantuniversity.com/colleges/chd/english/profiles/ogbulogo_charles.html.

Newspaper or Magazine Article on the Internet

Ogbulogo, C. (March, 2010). Issues in Language and Communication in Nigeria. *The Light Magazine* Retrieved February 3, 2010 from http://www.charlesogbulogo.com/articles/downloads.html.

Book on CD

Ogbulogo, C. (2005). *Concepts in Semantics* (CD). Lagos: Sam Iroanusi Publications.

4.0 CONCLUSION

In this unit, we have discussed the Classical method of referencing, the Modern Language Association (MLA) referencing and documentation style and the American Psychological Association (APA) referencing and documentation style. These referencing styles are important in the Social Sciences and Humanities and students are encouraged to master them.

SELF-ASSESSMENT EXERCISE

3. What do you understand by Classical method of referencing?
4. Differentiate between MLA and APA format.

5.0 SUMMARY

In this unit, you have learnt the:

- Classical method of referencing
- Modern Language Association (MLA) referencing and documentation style
- American Psychological Association (APA) referencing and documentation style.

6.0 TUTOR-MARKED ASSIGNMENT

1. Differentiate between ibid and op. cit.
2. What do you understand by APA documentation style
3. Differentiate between MLA and APA format.

7.0 REFERENCES/FURTHER READING

Gibaldi, J. & Achtert, W. S. (1988). MLA Handbook for Writers of Research Papers. New York: The Modern Language Association of America.

Mouton, J. & Marais, H. C. (1996). *Basic Concepts in the Methodology of the Social Sciences.* Pretoria: HSRC Publishers. Newbury Park, CA Sage.

UNIT 2 THE PROCESS OF REVIEW OF LITERATURE

CONTENTS

1.0 INTRODUCTION

During the course of a research work, the student is expected to make use of information gathered from researches done by others. The process of consulting studies or researches done by other people or done in other contexts centering on the topic of the student's interest is called literature review or review of related literature. In this unit, we shall be focusing on the process of literature review, its functions and how to effectively search for literatures.

2.0 OBJECTIVES

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

- state the meaning of literature review
- state the functions of literature review in a research work
- effectively search for literatures concerning any field of interest.

3.0 MAIN CONTENT

3.1 The Meaning of Literature Review

Literature review simply implies reviewing all relevant studies centering on the topic of interest. Literature has to do with all the previous research work consulted in the process of the research work. Hence, to effectively do this, the researcher might consult journal articles, books, reports, theses of others, electronic sources and so forth.

It is important to note that the literature review focuses on how to identify existing work on the area of focus and 'how to solve the research problem.' Not only that, the literature review process helps the

researcher formulate good hypothesis. This might be the reason why the hypothesis comes immediately after the literature review. It is assumed that the researcher while reading literatures adjusts the focus of the research and possibly modifies the questions the research is set to answer.

In examining relevant materials to the research topic, the onus is on the researcher to identify and select only relevant materials. The researcher in the process of reviewing literature is also expected to note 'gaps' in the studies and try to fill such gaps. Various studies, especially empirical research works have sections for recommendations and limitations of study. The researcher is expected to use these recommendations and limitations as basis for understanding the gaps in such studies and try to fill such gaps in his or her research.

Hence, the researcher is expected to critically analyze the literature, compare the literature with other studies and come up with a position. The main crux of the process is to critically examine the basic ideas already established or researched on in an area. It is important also to look at the strengths and weaknesses of such studies focusing on the research problems and objectives. The major importance of reviewing literature has been described above. There is also a personal importance to the researcher, it adds to the body of knowledge the researcher is open to. It is important to note that the process of literature review is not aimed at amassing summaries of irrelevant researches but at identifying relevant and useful ones and appraising their strengths and weaknesses and taking a position whether the researcher conducted the research well. In appraising researches, one must look at the methodologies, the analysis and the findings critically. Hence, the researcher is expected to put the outcome of the review of literature into a coherent whole pointing out their strengths and weaknesses, shed light on controversial areas and take a position as to what area of departure should be with regards to further research. This simply means that the outcome of the literature review is basically the reason for embarking on a research.

3.2 Functions of Literature Review

What is the purpose of a literature review, what function does it serve in research work?

According to Akinade and Owolabi (2009), literature review serves the following functions.

1. It brings clarity and focus to research problem
2. It improves understanding of the research problem
3. It also improves research methodology

Literature review also enables us to do the following.

1. **Literature review helps to identify the research methodology to adopt:** Most times, the unskilled researcher meets a roadblock in the process adopting a research methodology. But during the course of literature review, the researcher sees previous studies done in that particular area and also sees the design and methodology the researchers adopted and why they got the results they got. This will then guide him in his selection of the appropriate research method.

2. **Literature review increases the researcher's knowledge base:** Most times, novice researchers enter into an area where they do not understand. However, literature review helps them have a good grasp of what the area is all about. Literature review enlarges their insight into what has been done, theories and general points of departure with regards to the study. Hence it gives them deeper insight and broadens their horizon and equips them with the skill and knowledge base needed to proceed on the research.

3. **Literature review enables researchers to discover gaps to be filled in literature:** This is one of the major functions of the review of literature. The knowledge gap refers to areas, which have been unexplored, unresearched, or uncharted in or avoided by researcher in previous researches. This is done in order for the researcher to be able to make a significant contribution to existing knowledge and not engage in over flogging an area of research. In the process of literature review, the researcher discovers missing links in research and tries to fill them. This process equips the researcher with information on how to embark on his work. It shows what has been researched on in that area, what is being researched on and what could be researched on. This then informs the researcher on whether to conduct a study replicating what has been done already or to conduct a new study in the same area. This is important in order to avoid a reinvention of the wheel and duplicating of efforts.

4. **Literature review: S**ome researchers conduct research and later find out that they have missed citing major researchers in that area. For instance, it is an anomaly to conduct a comprehensive research work on linguistic and non-linguistic knowledge and not mention the *Chomskian* point of view. It is only through the process of literature review that such scholars and their contributions are known.

5. **Literature review enables the researcher take every view into consideration in embarking on the research:** Literature review also assists the researcher in looking at the research from all the sides and not having a one sided view of the research area. It gives the researcher a panoramic view of an area. This is not to say that researches are done considering every view. It simply means that during the process of literature review, the researches done within that particular area are examined. This gives the reader of such papers, studies or articles an idea that the researcher has taken into consideration a wide range of perspectives before embarking on the present study. It gives the reader the impression that the researcher knows what he is doing.

6. **Literature review sheds more light on the theories surrounding a particular research area:** There are theories that are in journals and may never be published in textbooks. There are some that may never become prominent even if published but these theories might be known to have been formulating by experts at different times. Therefore, it is expected that one review relevant theories surrounding his/her area of interest to acquaint oneself with present knowledge in that particular area.

7. **Literature review enables the researcher in the choice of research topic:** Literature review enables a researcher choose a topic for research and modify the one that may have been chosen. This is because in the process of reviewing literature, one will definitely come across an area of the research where the researcher made recommendations, stated limitations of the study and suggestions for further studies. In making suggestions for further studies, the researcher points out what needs to be done in further research. In the limitations, he points out limiting factors in the process of the research. These points could be used as areas of departure in forming a topic for research.

8. **Literature review enables the researcher decides on whether to continue with the research or not:** This points to the avoidance of duplication of efforts. Most researches people want to conduct have been earlier conducted and at times, they have been done with better designs and methodologies than what we want to apply, hence, the need to review literature to see what has been done and what has not been done. Once this is done, the researcher decides to either continue with the work or leave the topic if it has been done better elsewhere.

9. **Literature review enlarges the information, ideas and concepts relevant to the research:** Literature review enables the

researcher to extend the knowledge base of the study. The researcher's knowledge base is broadened through the process of literature review. The review also sharpens the focus of the knowledge the research is set to communicate. Literature review makes a particular research rich in information and broadens the scope of the study.

3.3 Searching for Sources for Literature Review

Akinade and Owolabi (2009: 64) noted the following as some of the sources for literature on a research problem:

- Books
- Journals
- Projects, dissertations and thesis
- Periodicals
- Indexes and Abstracts
- Encyclopedia
- Internet.

1. **Books:** The importance of books lies in the fact that most theories used in theoretical reviews are found in books. This simply means that books contain an interpretation from the book author's point of view, studies done in a particular area. Moreover, books are written in simple everyday language, which most people are conversant with. However, it is also important for the researcher to make use of firsthand sources of information like journals and periodicals.

2. **Periodicals and Journals:** Periodicals are collections of articles. These can be newspapers, magazines or journals. Periodicals are published within periods such as weekly, monthly of bi-monthly and so forth. Periodicals are a rich source of information. For instance, newspapers constantly have new reports, magazines have brief authoritative and concise articles and Journals are scholarly references that contain research outcomes by experts in journal's area of focus. The information in journals is contributed by seasoned experts and is a rich source of information for the researcher since it contains longer articles, which are results of qualitative or quantitative researches. The interesting fact about periodicals is that any new research invention, theory, idea or concept is first published in periodicals.

3. **Projects, Dissertations and Thesis:** Previous researches done by students in various levels – B.Sc., M.Sc. and Ph.D. are other rich sources of information for researchers. However, it is important

to note that some of these sources are replete with methodological errors which should be avoided. Hence, students are advised to examine these works critically before using them.

4. **Indexes and Abstracts:** The researcher can also examine abstracts and indexes as sources of information for literature review. Indexes are compilations of titles of research articles published in several journals within a period. The index contains author's name, paper title, year of publication, journal title and page number while an abstract is a collation of summaries of research articles, conference proceedings, theses, and so forth. It contains the summary of the research background, research problems, research methodology, findings, conclusions and recommendations, the researcher's name and affiliations, publication type, page numbers and so forth. It is important to note that there are electronic sources or databases for abstracts like ERIC and MEDLINE databases.

The above information can be obtained from libraries. These libraries could be public or private libraries. In addition, government ministries could be a major source for obtaining information. For instance, the Ministry of Information has a research and statistics department where all the information that has to do with any form of communication within the country is easily accessible.

4.0 CONCLUSION

In this unit, we have explained the meaning of literature review, and the functions of literature review in a research work. We have also identified sources of materials for literature concerning any field of interest. You are advised to get acquainted with the procedures for effective review of literature.

SELF-ASSESSMENT EXERCISE

1. Explain what you understand by literature review.
2. Mention two sources of literature information.

5.0 SUMMARY

In this unit, you have learnt the following:

- the meaning of literature review
- the functions of literature review in a research work
- sources of literature.

6.0 TUTOR-MARKED ASSIGNMENT

1. Mention five functions of literature review.
2. Differentiate between indexes and periodicals.

7.0 REFERENCES/FURTHER READING

Akinade, E. A. & Owolabi, T (2009). *Research Methods: A Pragmatic Approach for Social Sciences, Behavioral Sciences and Education*. Nigeria: Connel Publications.

Malim, T. & Birch, A. (1992). Research Methods. In T. Malim., A. Birch, & A., Wadeley. (Eds.), *Perspectives in Psychology*. London: Macmillan.