PRACTICAL GUIDES TO PROJECT WRITING

For

Students in Polytechnics, Colleges and Universities

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ABDULWAHAB OLANREWAJU ISSA

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STUDENTS IN POLYTECHNICS, COLLEGES AND UNIVERSITIES

BY

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DEDICATION

This work is dedicated to the Almighty Allah, whose kind Permits and Blessings made this an easy accomplishment for me.

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The inspiration to write this book came from may sources; the most primary of which is God, the Almighty Creator and Originator; the Able and Capable, the One and Only-Allahu. To Him is my unreserved gratitude and appreciation in recognition of His Bounties, His Guidance and His Protection over my entire family members this far.

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To all other individuals, too numerous to mention, who had contributed to the successful completion of this book, one way or the other, and especially my colleagues here in the Department, I thank you very sincerely.

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FOREWORD

Today, many students in tertiary institution in Nigeria embark on project writing without understand the basic procedures involves. The author of this book had taken his time to bring the knowledge of project writing to a simple, easy to understand form by highlighting the fundamental needs of students in this regard. He was able to make the contents sequential and free from ambiguities usually associated with many texts on this subject.

Given this approach, there is no doubt that the author has been able to come up with a suitable textbook for project writing in our tertiary institutions. This is to the extent that with the text, little assistance would be required by the students for a thorough understanding and acquisition of the skills needed for project writing. Thus, the text is suitable for both lecturers and students in institution of high learning.

It is without gainsaying therefore that the efforts and indeed, thoroughness of the author cannot go without being commended. It is to this end that I am pleased to recommend this text to students and lecturers in our tertiary institutions generally as well as other categories of researchers and other readers generally.

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PREFACE

More often than not, authors in this subject tend to be quite sophisticated in their treatment of the various issues involved. The term research, which most authors used in their writings on this subject matter appears advanced and difficult, if not ambiguous, to many students in our tertiary institutions today.

Yet, every prospective graduate in our universities, polytechnics and colleges of education has an obligation towards project writing as one of the key requirements for the award of certificates. This is against the odd of the unfortunate reality of very weak academic background of such students from the secondary school. Such a weak background probably accounted for the huge tendency, among prospective graduates in tertiary institutions, having preference for copious and unscrupulous duplication of other people's project works from libraries.

This unfortunate practice has become so prevalent among all categories of students to such an extent that stakeholders in the educational development of Nigeria cannot continue to ignore. This book, therefore, intends to treat the subject of project writing from not just a practical perspective, which had already been done by several books in this area, but more importantly to present it from a rudimentary approach, seeking a basic understanding of the necessary skills required for its successful completion.

It is the belief of this author that the very advanced nature of presentation adopted by most research methodology writers has helped to discourage many students from seeking a genuine understanding of this easy subject matter. Situations whereby the supervisor himself is hardly experienced enough in this skill further compound this problem.

Being an old student of research methodology; both theoretically and practically and coupled with long experience of serving in research-related committees in both the university and the polytechnic systems for over a decade now, this author has come to the conclusion that basic approach to project writing would be the much long awaited antidotes to this seemingly intractable cankerworm. Hence, the desirability and ample justification for this text.

Abdulwahab Olanrewaju Issa

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CHAPTER ONE

THE CONCEPT OF RESEARCH AND PROJECT

Defining the Basic Concepts

At the centre of any discussion on project or project writing lies the concept of research. This is to say that no good understanding of the concept of project will be possible without a prior understanding of what the term research is. The need to begin, quite logically, from the point of view of research; is therefore apparent. So, what do we mean by the term research? The origin of the word research is a French word "rechercher", meaning, "to look for again." The word is composed of "re" which in the French language means "again" and then "chercher", "to look for."

The whole idea was borne out of the fact that when someone is searching for something, it is expected that he has an idea, however faint or clear, about what to do to find that thing; where to find that thing and how to go about looking for and finding it. With these requirements fulfilled, the person may or may not achieve his aim of finding what he set out looking for depending on a number of other critical reasons.

In the words of Durotolu {2003) if he fails, he begins to re-examine his initial ideas, which were nothing but assumptions about where his object was supposed to be found, what he thought should be done to find it and when he thought it could be found. He then considers several alternatives to these assumptions and after making up his mind over such new ideas, he starts yet another search. That is, he starts to search again; thus, the term research simply implies looking for something again in other alternative places; putting up 'new' efforts, and taking nothing for granted.

This thus formed the basis for the many definitions of the term research as given in so many authoritative works. For instance, Bush and Harter {1980} defined it quite simply but broadly as "the systematic quest for knowledge", while Drew {1993) viewed it as "a systematic way of asking questions, a systematic method of inquiry." As for Leedy {1993} the term research is "the manner in which we attempt to solve problems others have presumably solved".

Best and Kahn {19998} took a more comprehensive approach in their own definition of research as the "systematic and objective analysis and recording of controlled observations that may lead to the development of generalisations, principles, theories resulting in prediction and ultimate control of many events that may be consequences or causes of specific activities."

The above probably explains why Osuola {1993} considered the term simply as "the process of arriving at dependable solutions to problems through the planned and systematic collection, analysis, and interpretation of data". On his own part, Adetoro {1986} took the methodology approach in defining research as "a process of discovery that must follow certain rules of conducting investigations and which is generally based on scientific enquiry where available facts are closely examined or investigated."

This is in line with the approach of Lawal {1995} in which the term was conceptualised from the point of view of the various stages involved; as "identifying a problem, stating the purpose, collecting and analysing valid data, and drawing valid conclusion." Onyere and Anunmu {2001} took a result-oriented approach in defining research as "a process of finding out a solution or answer to problems." They explained further that it is a planning process towards seeking and getting desirable information leading to the provision of plausible answers to reasonable questions. This is with a view to enabling people predict future occurrences and carrying out systematic investigations to solve problems.

In the words of Odediran {2001}, research is "a science of knowledge through investigation that is concerned with systematic way of finding information on an issue, subject or object." Thus, Issa {2003} deducting from the wide range of opinions as contained in the definitions above, concluded that the followings are considered as central to the idea of a research: -

i. A process which is systematic and organized rather than haphazard.
ii The existence and proper definition of a problem to be investigated.
iii Collection, analysis and interpretation of relevant data towards arriving at solutions to problems.
iv Generalising outcome of findings towards better handling of similar event (s) in the future .

The Characteristics of a Research

From the foregoing conceptualisations of the term research, on can safely make the following summary as being the characteristics of a typical research project writing: -

a. That a typical research project must begin on the basis of a problem in mind for which purpose the research sets to resolve. Generally speaking, it is believed that there cannot be a research project in the absence of a problem of interest.

b. That the outcomes/findings of a typical project should help to develop generalizations, principles and theories, which, when applied in other similar situations in the future, could produce the same results. That is, the methods employed to arrive at the results/findings should be reproduce able and yield same results under varying circumstances elsewhere.
c. That the process of conducting the research project must, of necessity, be as systematic and empirical as possible, through the collection of relevant data for the project. This becomes imperative if (b) above must be achieved.
d. To achieve both (b) and (c) above, there is the need for carefully and appropriately selected research plan, otherwise known as design or method, serving as guideline for the research procedures.
e. In the end, the outcomes/findings of the research project should contribute something new to the growth of knowledge in that field of study. Thus, every research project must help to expand further the present frontiers of knowledge.

The Processes Involved in a Research Project

The processes involved in a typical research project have become scientific in nature. This scientific nature of research projects has, in turn, brought about their empirical approach to problem solving rather than speculations. Thus, there are well-defined stages involved in this scientific/empirical approach to research undertakings, which are quite similar to the characteristics of a research project given above. These processes include: -

a. **Identification of a Researchable Problem**-Although it is expected that the research project should emanate from real-life situations, it is equally important to note that not all real-life situation problems are researchable. There must be a balance between these two.

b. **Clear and Concise Statement of the Research Problem**: - This is quite important in view of the fact that it is just one thing to be able to identify the researchable problem. It is yet another, quite different thing to be able to put same down very precisely, concisely and clearly. The problem would seize to be researchable until and unless one has been able to state it so well and good as to be precise, concise and clear.

c. **Formulating Necessary Research Questions and/or Appropriate Research Hypotheses**: - Note that there is a difference between Research Question and Research Hypotheses. A research hypothesis is a definite statement whose supposed truth or practicability is testable through the scientific method. It is a form of statement, which declares one's prediction on the subject matter intended to help clarify certain ambiguities/doubts. On the other hand, a research question is an intelligent question posed by the researcher, consequent upon the clear statement of the problem. The research questions are set in such a way that once answers have been provided to them, the research problems in question become resolved. Thus, the research question forms the basis upon which the questions on the research questionnaire, otherwise known as "questionnaire items" are formed. Although there are research projects, which have hypotheses and research questions combined, especially at the very advanced stage of research, several other research circumstances required only one of the two.

d. **Collecting Required Data for the Research**: - Due to the empirical nature of the scientific method of research, data are to be collected on the subject of investigation. Instruments such as questionnaire, personal/direct observation, interviews and documentary sources are often used for the purpose of data gathering. The instruments are so designed that they seek specific information from respondents, which would help in providing needed answers to the research questions and/or providing relevant data for testing the hypotheses. By the term "respondents", we refer to the group of research subjects {people} from whom the researcher intends to collect relevant data for the purpose of his research project. This could be students in a class or group of classes, primary and post-primary institutions, farmers, technicians, medical doctors, engineers, market women, etc. in a particular point in time.

e. **Presenting for Analysis and Discussing the Data Collected**: - Since the researcher will basically collecting raw data from the field of study, it is expected that such data are presented first, and then subjected to discussions and interpretations. There are so many methods of doing this; depending on such things as: -

i. The type of research in question.
ii. The type of instruments for its data-gathering; and
iii. The types of data collected in the end.

Regardless of all these, however, it is important to note that tabular presentation of data as well as diagrammatic representation in the forms of charts, histograms and frequency tables, are common. For hypotheses testing, the various but relevant statistical methods are employed and are so presented for necessary discussions and interpretations.

f. **Drawing Inferences, Conclusions and Recommendations from the Analysis**: - This is where the so-much-talked-about contribution(s) to knowledge is made manifest and clearly stated. That is, what the inferences, conclusions and recommendations set out to do; and it is on this basis that generalizations, principles and theories would be derived. Stakeholders are hereby assigned responsibilities with a view to ensuring that the present conditions are improved upon.

Why Research Project?

The question "Why Research Project" is a very fundamental one, which seeks to know the importance of research projects. However, to answer the question adequately, there arises the need to examine briefly the issues surrounding the emergence of research itself. It is no exaggeration that we have always lived in a world full of so many facts-yet to be known and yet to be discovered.

To be able to rise above the challenges posed by his environment therefore, man was created curious and inquisitive. By nature, he sought after finding answers to the numerous puzzling and yet-to-be answered questions in his environment. Due to the fact that he was always surrounded by this situation, man found himself being compelled to search for answers to this wide range of "unknowns" as a precondition for his survival in his environment.

Even though, man had always been in this condition of ever searching for solutions, it is remarkable to note that the approaches have also been crude and haphazard. It was only with the advent of science that things changed for the better in this regard. This is because science brought about a formalized and systematised approach to this effort, such that there are new, common and indeed, widely accepted ways of carrying out the "search". This is what many often refer to as the "scientific method." Thus, the importance of research to individuals, groups, corporate bodies and

governments, in both private and public lives of any society cannot be over-emphasized.

The Importance of Research in Society

Research was considered as one of the most important tools for: -

(a) ***Advancing the Frontier of Knowledge***: - The outcomes/results of research projects are expected to contribute something new, however little, to knowledge in that particular area of study. By such a contribution, the present boundaries of knowledge in that field will be extended and expanded further. Most inventions and discoveries made by man by man especially those of the scientists are direct products of research efforts.

(b) ***Promoting Progress in the Society***: - This is related to the above in that progress in society is the direct product of the application of research results to addressing social, political and economic problems. Though such applications, the human society is made a better place for everyone to live in. This has had a tremendous impact in the condition of our generation today when compared with those of our forefathers. Few examples of such research products include the computers and Internet.

(c) ***Enabling Man to Relate More Effectively with his Environment***: - Due to the complex nature of man's environment in which man had found himself, he has little or no choice than to subject the environment to his own which and caprices; if must survive the reward of such efforts in terms of research has helped man not only to better understand his environment but also to subject same to his deserves through "conquest". By "conquering" his environment therefore, man held proven that he is in control of what happens in and around his immediate and even distant environments. No wonder than that we all talk about "the global village" today in apparent reference to the world, which has now shrunk to the size of a typical village, as a result of breakthrough in the area of telecommunications, and computer, which are themselves products of research.

(d) ***Assisting Man to Accomplish his Purpose***: - As a result of the exponential advances mentioned above, it goes without saying that individuals and groups who live today have had their lots much more improved when compared to those of the earlier times. This is for the fact that research impact naturally translates into great social, economic and political benefits for the citizens. Individual goals become much easier to

accomplish; thereby making life more meaningful and desirable to the majority.

(e) ***Helping Man to Resolve his Conflicts***: - It is a known fact that man lives in a state of constant conflicts; if not between him and his environment; certainly, between him and his fellows. This can be accounted for by the fact that what he needs to know far outweighed what he already knew. It is by constant engagement in this "discovery" process known as research that he stands great chance of getting answers to his numerous problems; thereby resolving his conflicts.

How is Project-Writing Different from Research?

The New Webster's Dictionary of the English Language {1992} defines "project" as "a course of action intended or considered possible; a systematic planned undertaking". It goes further to define "research project" as "a set of task for a class of school children in which, for a given period of time, subjects are taught with special reference to some chosen topics, and pupils are encouraged to make independent inquiries to supplement formal teaching".

Writing, on the other hand, is the process of arranging words in logical order and carefully chosen so that a reader can understand what the writer means clearly and concisely {Aina, 2002}. He remarked further that writing skills include: -

(i) Choosing appropriate style
(ii) Providing correct spelling, punctuation, grammar and capitalization
(iii) Ensuring appropriate leadings and subheadings, sentencing and paragraphing.
(iv) Editing and revising manuscript appropriately.

It becomes clear from the above that both project-writing and research point to the same thing except in slightly different ways. although both refer to the process of conducting an investigation, research tend to be associated more with the advanced form of such investigations. For instance, it is common to hear of research at the post-graduate and even post-doctoral levels mainly.

On the other hand, the term project-writing associates more with the undergraduate long essays intended to be written, supervised, bound and submitted to the individual candidate's department in partial fulfilment of the requirements for the award of certificates. Students in tertiary institutions

like the polytechnics, colleges of education and universities are very familiar with this concept as hardly could any of such students graduate without fulfilling the righteousness of submitting a project work.

Thus, one can conclude that research is the advanced form of project writing. Not only is it more rigorous than project writing, the sophistication and expertise professionals are readily and extensively deployed in its conduct. Whereas project-writing represents the elementary form of research, it is the advanced kind of project-writing that is usually referred to as research. It is in an effort to differentiate between these two that such terms as project, thesis and dissertation have been used to indicate the level of which a particular research work applies.

Even though the three terms can be used inter-changeable, it remains a fact that the use of thesis dissertation applies more appropriately for post-graduate research than to undergraduate project writing. Whereas a project need not necessarily be defended, both thesis and dissertation undergo a number of defences, bringing about a variety of input from many experts into the study. Hence, the rather higher quality of the research works as compared to that of the project-writing.

This book is, however, targeted primarily at those who fall in the project-writing group for obvious reasons. As for the group of advanced researchers, numerous texts already exist to take care of their needs; while this can only serve as appetizer to them. The driving force here is to produce a text that will simplify the rather difficult subject of research undertaking, especially from a practical approach point of view. This is in the hgope that students would be better disposed to seeking a rather genuine understanding of this subject matter thereafter.

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CHAPTER TWO

SIGNIFICANT CONTRIBUTORS TO PROJECT WRITING

The efforts required to write a project successfully must be concerted. In other words, several things and individuals are involved and contribute significantly towards the successful completion of the project-writing. Some of these significant contributors include the following: -

The Student Researcher

The first, and indeed, primary significant contributor to project writing is the student researcher himself. The project-work is meant to be carried out by the student. It is expected that such a student has learnt the rope in his chosen field of study sufficient to enable him carry out the investigation.

This explains why the students are expected to engage in such a commitment only in their final years. Then, they must have read quite extensively on their fields of study to discover areas needing investigation. In addition, it is expected that at that stage, the student had become quite versatile to handle an area of investigation in his subject area that is of interest to him.

The Supervisor

Considering the complex nature of conducting an investigation as this, the student is not expected to do it alone in fact. He cannot hope to do it, all on his own. That is why he needs to be under the close and able guardianship of a supervisor who, in most cases, is a professional and of course, a lecturer in the student's department. The supervisor is directly involved in the investigation right from the beginning; helping to fashion out; shape and re-shape the project title and all that followed there from.

At every stage of the investigation and writing, he contributes by going through the work; making necessary input, effecting corrections, seeking clarifications from the student researcher, advising on appropriate steps to take and even editing the work as he proof-reads it. Thus, one can see that his contribution to the process of conducting a successful investigation cannot be over-emphasized; hence, a significant contributor.

The Library

For those who know, the library being a research tool itself, represents a very significant contributor to research undertakings. This is to such an extent that no quality research can be done in the absence of a good library, especially its use. Because it acquires, organises, preserves and disseminates information materials on all area of human knowledge, the library became the first place to visit when embarking on research undertakings. That is, you find the widest range of ideas, opinions, and previous findings on every subject matter. If you must conduct a worthwhile investigation, you need to know what others have done in that area; how they have done it and where they stopped. This is the logical beginning for any investigation and its investigator.

But you cannot find about all these elsewhere except in the library. Otherwise, you stand the risk of either doing it wrongly and therefore failing in getting the desired results. No one individual can claim to be the reservoir of knowledge; as he can only boast of knowing just a little of everything in his own little area of specialization. To this natural disadvantage, the library has helped to present an appropriate alternative.

This, it does by making readily available to all, information sources on virtually all area of human endeavour from different view points. Also significant is that the contents of a given library regarding the various information and knowledge materials have no ethnic, social, cultural, economic, political and even time barriers; as they relate to all people from all places and at all times. That explains the unique place of the library in the conduct of any research or project-writing.

The Internet

Simply put, the Internet can be described as the global network of networks of computers whose resources are made readily available to all users all around the world. With particular reference to the Library and Information Science profession, the Internet is a good example of a non-printed reference source. It is a network of computer networks worldwide, an “Information Highway” because of its capacity to transmit a vast amount of information to anybody anywhere around the globe.

Internet resources could be likened to those in the library except that it boasts of a rather wider coverage as well as a higher degree of recency. The structural limitation imposed on the library owing to its restrictive nature have been offset by the advent of the Internet. While its resources cannot be said to be a substitute to those in the library, the Internet still remains an indispensable research tool. To combining recency with comprehensiveness,

the researcher stands better chances with the Internet than with all other information sources and resources put together. This is especially so for researchers in the developing parts of the world; since with minimal cost and effort, they can access the Internet readily, making good use of its resources at will. Thus, the researcher is expected to avail himself the use of the Internet as an extension of the ideals for which the typical library actually exists. It is common today, therefore, to be advised to search on the Internet for relevant literature on a given subject interest, especially after having exhausted the resources in the library. The Internet, according to Aina (2001) provides such facilities as: -

Electronic Mail

This is a facility through which people can communicate messages electronically to any point in the world. The speed of such communication is so high that the ordinary paper communication is often referred to as the "small mail".

Telnet

Through the Telnet facility, on line catalogues or public access catalogues can be accessed.

On line Searching

On line databases world can be accessed and searched using a number of search engines such as Yahoo, Alta-vista, Infoseek, etc.

Electronic Publishing

A number of publishers of books and journals are moving into electronic publishing. An advantage of electronic publishing is that authors who cannot publish through known publishers have the option to publish material directly on the Internet. Some of the electronic journals are peer reviewed.

One other advantage of the electronic journals for researchers is that they are available in full-text and more often for no fee. In some cases a simple search can be done at the website. Example of full-text, peer-reviewed electronic journals in Library and Information Science are Dlib magazine *http://dlib.org* and Library and Information Science Research *http://www.bubl.ackuk/journals/lis/kn/laisr*.

User Groups

The Internet also provides opportunities for different groups, students, researchers and academics to form discussion groups on the Internet. This facility promotes collaborative research, co-authorship and consultation in a speedy manner through the Internet. The Internet facilities described above indicate that it has a vast potential of information in its various forms, which can assist researchers in all fields of human specializations. This, to a large extent, will depend on the individual's research interest. The E-mail facility, for instance, allows for the communication of information. In reference to the Library and Information Science profession, the value of this can be seen within the context of library services such as on line enquiries to the library and reference centres and subsequent valuable responses.

The Typist

The contribution of the typist - electronic, manual or computer - is of great significance to successful project-writing. Consider that both the student and his supervisor had done a wonderful job so far. The writing, proof reading and editing have all been quite well done. These automatically translates into good work only when and until the typist had done his/her work with all the thoroughness it deserves.

To a critical supervisor, an investigation well conducted and written is not an end in itself. Rather, the ability to come out with a clean copy of the work that has been well typed represents the desirable completion of a project work. That is why the student is expected to supervise the typing of his project with as much seriousness as it was given to the conduct and writing of the report. It will amount to bad finishing for him to abandon the work with the typist at this critical moment, which is the general practice among the majority of student researchers.

This usually has very grave consequences, as it is this final, clean copy that the supervisor assesses. In other words, it is this copy that is used by the project supervisor as the basis for awarding marks to the students. If the work had been subjected to avoidable errors of mistyping, the student, and no one else, pays for it dearly by having all of his efforts, time and resources wasted by earning a very low score on that account.

This becomes particularly painful considering the fact that project, as a course, attracts higher credit units of between two to six, depending on the institution and department. It may be wise therefore, for the student to think of the damaging effects of a low score in such a higher credit unit course on his over-all performance. Only then can he come to appreciate the essence of ensuring a good typing of the project.

Thus, the typist is the student's partner-in-progress; and so he must see it while the relationship lasts. He must keep on remembering that the typist's job will either make or mar his. The only chance he has against undesirable finishing is to supervise the typist quite closely and seriously throughout the period of the typing, however difficult this may be. The good outcome expected is the gain, which is worth the pains. After all, if it is worth doing at all, then it is worth doing very, very well.

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CHAPTER THREE

TYPES AND METHODS OF RESEARCH

Often times, many tend to confuse types with methods of research. Though sounding similar, the two are not the same; as types refer to the nature of research while methods are concerned with the process of carrying out the investigation. Hence, the need to discuss the two separately here.

Types of Research

The nature of research otherwise refer to as types of research can be broadly categorized into two namely: -

i. Basic pure or fundamental research.
ii. Applied research.

Basic Research

This is concerned with the process by which the present frontiers of knowledge are expanded so that people could gain a better understanding of their environment. Its primary goal is to provide useful information, for future application thereby contributing meaningfully to the existing body of knowledge in a particular discipline. Usually, ***Basic Research*** is associated with producing generalizations and principles as well as development and refinement of theories.

Applied Research

Unlike the ***Basic Research, Applied Research*** is concerned with finding solutions to practical problem with an immediate effect. The main goal of ***Applied Research*** is to improve a ***process*** or a ***product***; since its target is finding solution(s) to the problem at hand; hence its immediate problem-solving goal.

Both basic and applied research use sampling techniques and make inferences about target population. It sets to improve a ***product*** or a ***process*** by testing concepts in actual problem situations. A special type of applied research is known as ***Action Research*** whose primary objective is to find solutions to localized day-to-day problems.

Under these two broad headings, types of research can also be classified into ***qualitative*** and ***qualitative*** as well as ***conceptual*** and ***empirical***. Any research involving the use of measurements at both interval and ratio levels in the collection of data is said to be quantitative. It

formulates and tests hypotheses so as to arrive at statements of theory. Its data must be measurable and can be collected through non-participant observations, questionnaire and documents.

On the contrary, observation technique and in-depth interviews are two main data collection methods employed by qualitative research. It is carried out in its natural setting; which accounts for why it is more or less presented in a narrative form devoid of any quantitative measurement. In the case of a conceptual research, its goals are directed to developing new concepts or reinterpreting existing ones in an abstract form; involving the use of logic, reasoning, intelligent and intuition.

On its own part, ***empirical research*** is concerned with the collection of verifiable data which would produce the same results should another researcher carry out the same study under the same conditions elsewhere. It formulates and texts hypothesis while its factual outcomes are external to the researcher since those outcomes would have been derived from the experiments already carried out

Methods of Research

There are several Research methods, as it is also known, used by researchers in the conduct of research. It is important to note that there is on hard and just rule regarding the kind of research method to be adopted in any given research situation. Instead, the choice of a particular research method is strictly a function of the nature of the problem being investigated.

In other words, the appropriateness of a given research method is determined mainly by the kind of investigation being conducted. This, in turn, determines the kind of data that will be generated in the course of the research. Some of the commonly used research methods, according to Aina (2002), include the following namely: -

i. Social Survey Research.
ii. Historical Research.
iii. Case Studies Research.
iv. Delphi Studies Research.
v. Bibliometric Research.
vi. Citation Analysis Research.
vii. Experimental Research.

Social Survey Research Method

This method is commonly referred to as ***Survey*** or ***Descriptive Research***. It is the method associated with research situations, where the research subjects run into hundreds or even thousands, spreading across a large area. Its underlying principle is to seek the opinions of individuals on a particular problem, whereby the consensus of these opinions provides the needed solution to the problem at hand.

One of its main characteristics is that of selects a sample from a population, due to the sheer inability of the researcher to reach every member of the population as a result of their member and spread. With a carefully selected sample, the results obtained from the sample will be used to generalise the population. There is the choice, therefore, to obtain information from a sample population without necessarily seeking the opinions of the whole population.

The one condition which must, however, be fulfilled here is ensuring that the selected sample is not only unbiased but also representative. Hence, the use of sampling techniques to determine the appropriateness of the sample. Thus, the questionnaire, interview and observation are often used as data collection instruments to obtain the opinions from the sample in a survey research.

Historical Research

Considering the Greek word ***historia***, which means, "*searching to find out*", historical research method is an inquiry into the past. Its aim is essentially to interpret past trends of attitudes, events and facts. In other words, it is targeted at gathering information about events of the past, personalities involved and the developments that have taken place.

To this end, data would be collected mainly from the primary sources, which may include *manuscripts, annual reports, and gazettes*. In addition, the researcher arranges for interviews with personalities who are involved in or witnessed the developments. Sometimes, data have to be collected from secondary sources also. Historical sources may also be classified into two main categories namely: -

i. Documents, and
ii. Relics.

Whereas documents are usually written, relics are archaeological or geological remains like tools, utensils, equipment and implements. Documentary sources would include: -

i. Official Records, Minutes of Meetings, Committee Reports and legal Documents.
ii. Institutional Records, Attendance Rolls and Bulletins.
iii. Memoirs, Biographies, Diaries and Personal Letters.

Case Studies

This method is used to study a particular case in point with a view to examining in great depth and extent, the characteristics of that individual unit. What is considered as a unit of a *Case Study* will vary from one study to another. It can be an individual person, a family, an institution or even an entire community. This is the case with some case studies where emphasis is on pattern and sequences of growth and/or change as a function of time. This is why such studies are referred to as *Developmental Case Studies*.

In any case, the critical issue about case studies is that all variables connected with the unit (internal and external), have to be thoroughly identified and evaluated. The ultimate goal here is to gather comprehensive information about that unit being studied. Some of the instruments used in collecting data for case studies include *observations*, *questionnaires*, *interviews* and *documentary sources*.

Delphi Studies

This is a method of research, which Busha and Harter {1980} described as "a systematic approach to the generation of some consensus opinions among a group of carefully selected and anonymous respondents". Using this method, the researcher sets out to collect his data from a list of selected experts on his field of study. Every member of the expert group chosen will be expected to compile a list of opinions on the topic of research.

Once collected, all the responses would be synthesized into a form of questionnaire, which would in turn be made available to the experts for ranking. The data that the ranking process produces are subjected to statistical analysis. The new revised ranking will be incorporated into another questionnaire and made available again to the same set of chosen experts, who did the initial ranking. This process is further repeated until the researcher is able to present a consensus opinion of the experts.

Bibliometrics

This method of research applies mainly to research in the Library and Information Science profession. It involves the statistical analysis of any list such as *bibliographies, inter-library loan enquiries* and *reference enquiries.* The popular *Bradford's Law of Scattering* is usually applied as it enables the researcher to obtain the core area of a particular endeavour. Essentially, the *Bradford's Law* states that: -

> *If scientific journals are arranged in order of descending productivity of articles on a given subject, they may be divided into nucleus of periodicals more particularly devoted to the subject and several other groups of zones contain the same member of articles as the nucleus.*

The method is quite popular among libraries in this part of the world mainly because it allows for the ranking of journals that are in regular use in libraries. Similarly, one can compile a list of journals in which staff members regularly publish their papers and then rank them. This can be done from a list of publications of staff of a university.

One can also identity books commonly borrowed through *inter-library loans*, which the library can later acquire for its users. This can be done from *inter-library loans*. The outcome of this kind of study helps the library to decide on what copies of any particular material found to be regularly used or borrowed in the library are to be procured.

Citation Analysis

This is also common in the field of Library and Information Science like the *Bibliometrics*. In this method, cited references in selected journals are statistically analysed so as to find out the common journals cited by researchers in a particular discipline. The method is so similar to *Bibliometric* studies so much that it is even assumed to be a part of it.

Experimental Research

This is the most popular and perhaps the oldest form of research methods. It is a very predominant method of research in the pure and applied sciences. In this kind of research, we deliberately control and manipulate the conditions, which we have reason to believe determine the area in which we are interested. In other words independent variables are manipulated so as to watch the effects of this on the dependent variables.

The thrust of experimental research design is therefore to establish causality (that one factor can cause effect on another factor). Experimental research takes place in the laboratory because it aims at finding out the relationship existing between two factors under controlled conditions. Usually, there are two groups in this kind of research namely: -

i. The experimental group and,
ii. The control group.

Whereas the former is the group under manipulation, the latter is not. As the researcher exposes the experimental group to one or more treatment conditions, he is able to measure the effect, compared to the control group, which is not exposed to the same treatment(s). Thus, the experimental research strictly adopts the *Scientific Method* in its investigation. Essentially, this method involves the following process namely: -

i. Observation/problem statement.
ii. Formulation of hypotheses/theory.
iii. Testing.
iv. Conclusion.

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CHAPTER FOUR

PLANNING THE WRITING OF A RESEARCH PROJECT

Introduction

Embarking on project-writing is a very serious affair, which cannot deserve any less seriousness in its prosecution. Often times, students are tempted to believe that research project-writing is an haphazard undertaking which you can do anyhow, anywhere and anytime. This is grossly erroneous; as it is a commitment that is largely painstaking; and therefore requires a huge amount of sustainable interest that must survive the entire period of undertaking the project.

Recognizing this probably explains why school authorities keep the students on a very low number of courses for registration during the research project semester, to afford them the much-needed ample time and commitment to their project work. Unfortunately, many students see this occasion as an excuse for indulgence thereby misusing the opportunity and benefits intended.

What To Plan For

It is against the above temptation that the student researcher has to plan. He has to plan for a judicious use of time, efforts and resources that would be at his disposal. Otherwise, he will end up going to the library to literally "steal" as it were, other students' past projects, copying from them. When he does that, he will not be helping anybody; including himself; and it can only take a little time for him to realise just that.

The justification for planning could also be found in the common cliché that "if you failed to plan, then you have planned to fail". In planning the writing of the research project therefore, the student researcher is expected to meet up with a basic demand, which is to choose a suitable and researchable project topic. But this may not be as easy and simple as it sounds. This is because, choosing a topic may turn out to be the student's greatest undoing, which may mar his success; depending on his approach to it.

How to Choose a Suitable Research Topic

There are several issues involved in choosing a suitable research topic. Foremost, it is important to know that some people are more sensitive to the existence of research problems than others. This gives them the advantage of being able to choose suitable topics more readily than others

could. Beyond this, however, Osuola {1993} identified two major factors involved in this choice making exercise to be *experience* and *creativity*.

The student needs to choose a topic about which he knows something. After all, one expects, logically that only from a clear understanding of the theoretical, empirical and practical aspects of the subject, derived from personal experience and a thorough literature review can a good research problem/topic stem. This is because, once you lack the requisite familiarity with the subject matter, you are almost sure of making a wrong choice afterwards.

The second factor, bordering on *creativity* and other *personality attributes* are often associated with originality, flexibility, initiative, ingenuity and foresight on the part of the researcher. However, all these attributes are expected to operate within the framework of what is already known, just as familiarity with a given field is said to be conducive to original thinking.

Factors to Consider in Choosing a Suitable Research Topic

At this juncture, it is important to borrow from Holmes {1969} on some useful questions, which would be of advantage to the student seeking a problem for investigation. These are as follows: -

1. In your field of interest, what practical problems have to be met by those individuals who do the actual work?
2. In current and recent research, what problems are under active attack?
3. What facts, principles, generalisations, and other findings have resulted from research in your field?
4. What practical implications for schoolwork may be drawn from the results?
5. To what extent have the findings of research actually been applied in your field?
6. What problems remain to be subjected to research and what problems are now emerging?
7. What are the chief difficulties to be met in prosecuting the researches yet to be conducted in your field?
8. What are the inter-relationships between research in your field and research in adjacent fields?
9. What research techniques or procedures have been developed in your field?
10. What concepts have been operative, either explicitly or implicitly, in the research in your field?

11. What assumptions have been implicit or openly avowed in the research in your field?

Personal and Social Factors to Consider in Undertaking a Research

There are other personal and social considerations in the evaluation of a research problem. In doing research, there is the need to ask some basic questions at the onset. According to Akinwumiju (2001) answers to such preliminary questions will act as guides during the actual execution of the study: -

Personal Considerations

1. Is the problem in line with my goal expectations and the expectations of others?
2. Am I genuinely interested in this problem and free from strong biases?
3. Do I possess or can I acquire the necessary skills, abilities and background knowledge to study this problem?
4. Do I have access to the tools, equipment, materials, laboratories and subjects necessary to conduct the investigation?
5. Do I have the time and money to complete it?
6. Can I obtain adequate data?
7. Does the problem meet the scope, significance and topical requirements of the institution or periodical to which I will submit my report?
8. Can I obtain administrative support, guidance and cooperation for the conduct of the study?

Social Consideration

1. Will the solution of this problem advance knowledge in the field appreciably?
2. Will the findings be of practical value to educators, parents, social workers or others?
3. What will be the breadth of the application of the findings in terms of range of individuals, years of applicability and areas of coverage?
4. Will the investigation duplicate the work that has been or is being done adequately by someone else?
5. If this topic has been covered, does it need to be extended beyond its present limits?
6. Is the topic sufficiently limited to permit an exhaustive treatment, yet sufficiently significant to warrant investigating it?

7. Will the conclusions of the study be of doubtful value because the tools and techniques available to conduct the inquiry are not adequately refined and sufficiently reliable?
8. Will the study lead to the development of other investigations?

It is hoped that providing answers to some of these questions will help the student in making a good choice of his research topic. But if he still, cannot find one after this, Aina (2002) suggests the following sources from where he can identify a researchable topic namely: -

1. Practical problems in the immediate environment.
2. Areas suggested for further researches in previously conducted studies.
3. Perusal of dissertation abstracts on one's field of study.
4. Identification of gaps in the literature by going through journal articles, reports etc in one's area of research interest.
5. Research project commissioned by local, national, multi-national companies, non-governmental organizations and international organizations.

Hopefully, the student will, after all these, be able to arrive at a suitable topic such that he is able to define the broad problem that is of interest to him. By and large, it is important to know that there are no hard and fast rules guiding the selection of a suitable research topic. Rather, one can only suggest a few guidelines, as did Osuala (1993) to serve as guidance to the student in selecting a researchable topic. These include: -

a. That the topic must be of interest to the student.
b. That the topic must be sufficiently original and not duplication.
c. That the topic must be researchable since many problems of philosophical nature could only be discussed but not be researched.
d. That the topic must be significant to the extent that it contributes something new to knowledge in a given field of study.
e. That the topic must be feasible with regards to the availability of data on a given subject-matter.

The Research Proposal and its Importance

The *Research Proposal* is an important aspect of project writing. Once a research topic had been chosen, what the project supervisor demands of the student researcher is the writing and presentation of a proposal. This represents a kind of plan, which helps to reveal the intention as well as the

understanding the student has about the chosen topic. It is a sort of insight into how well the student understands the surrounding issues relating to the chosen topic.

The *Research Proposal* is quite similar to an architectural plan, which gives an insight into what the building will look like on completion. It is in this plan that every conceivable detail about the house to be built is underscored. It is in the same way that the research proposal seeks to highlight the nature, essence and method of carrying out the investigation; a kind of action-plan.

Thus, from the proposal, the researcher gets his focus sharpened; as he deploys his intellects to conceiving the plan of his research from the scratch through to the end. That way, himself and his supervisor have a tremendous gain from the proposal, serving as the foundation of the building. From here, all the perceived structural defects that could so fundamentally affect the construction are corrected once and for all.

By so doing, both of them are assured of a solid structure in terms of what comes on the solid foundation afterwards. Indeed, the proposal is a sort of master plan, which helps to guide towards perfection of the conduct of an investigation. It is a kind of summary score-sheet revealing the plans that are involved in carrying out a research work. Thus, Akinwumiju (2000) defines it as “an estimate of what an investigator intends to do, what others have done in the area and how you intend to do your own”.

Components of a Research Proposal

Although there is no one generally acceptable standard on what goes into a *Research Proposal*, the following are considered as critical to any good proposal: -

1. The Project Topic
2. Background to the Study
3. Statement of the Problem
4. Purpose/Objectives of the Study
5. Significance of the Study
6. Scope/Limitation of the Study
7. Research Design/Method
8. Population, Sample and Sampling Procedure
9. Data Analysis Procedure.

By the time the student had written on the above sub-headings, he would have formed a convincing idea of what he intends doing and how he intends going about it. At this point in time, he will be able to reconcile his project topic with his objectives; and the methodology to be employed. The exercise would have helped him to understand the possible contributions of his work to knowledge in the chosen area.

It will also help to reveal certain shortcomings that may attend to the conduct of the investigation as being proposal. This is because, the discourses under each of the subheadings above brings the student researcher closer to a better understanding, and of course, fuller grasp of the critical and central issues involved the research work. Hence, the desirability, on the one hand; and the justification, on the other; of the project proposal in any given situation.

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PART 11

A PRACTICAL APPROACH TO RESEARCH PROJECT WRITING

CHAPTER FIVE

WRITING THE PROJECT PROPER

Introduction

After necessary amendments of the research proposal by the supervisor, it is expected that the work be certified fit for conduct. It is at this point that the supervisor asks the student researcher to commence the full-blown project-writing; starting with the opening chapter. It is important to state here that a typical research project at this level consists mainly of five chapters, as contained in the following outline: -

Chapter One
INTRODUCTION

Chapter Two
REVIEW OF RELATED LITERATURE

Chapter Three
RESEARCH METHODOLOGY

Chapter Four
DATA ANALYSIS, INTERPRETATION AND DISCUSSION

Chapter Five
SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

However, the project supervisor does not require that you write the entire five chapters at a single go, as that would have defeated the very essence and spirit of project writing. Instead, he requests that you write and submit the introductory chapter, which is *Chapter One*. If you are lucky to have a considerate supervisor and depending on his research orientation too, he gives you an outline of what constitutes each chapter. The outline of *Chapter One* may include all or some of the following namely: -

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study
1.2 Statement of the Problem
1.3 Research Questions and /or Hypotheses
1.4 Objectives {Purpose} of the Study
1.5 Significance of the Study
1.6 Scope and Limitation of the Study
1.7 Basic Assumptions
1.8 Operational Definition of Terms

As can be seen above, the outline forms a great part of the research proposal and the student researcher only needs to "flesh up" the approved proposal in order to make it up as his *Chapter One*. It is expected that all the other components as had been written for the proposal would still stand, with the **Operational Definition of Terms** added to it. Now, it is important to know and understand what is contained in each of the subheadings in the chapter and these are explained below: -

1.1 Background to the Study

As its name implies, this aspect traces the history of the subject of investigation; the emergence of the problem; how he became interested in the problem. He goes on to explain the particular circumstances surrounding the problem, using evidences from the literature to backup various contentions. Here also, he tries to establish the desirability and feasibility of the study, judging from the ample evidences drawn from the literature.

In short, this is where the student researcher introduces the subject of his investigation using all available facts and figures to establish its foundation. Note that though there is no standard number of pages that this should take, the lengthier and well focused the *Background to the Study*, the better for a strong and solid foundation for that research being conducted.

1.2 Statement of the Problem

The *Problem Statement*, as it is also called, is the logical conclusion of the issues raised under the *Background to the Study*. The ideal is that while the *Background to the Study* provides a broader, or global perspective to the subject matter of the investigation, the *Problem Statement* makes derivations

from there and zero-in on the specifics as they relate to the particular investigation at hand.

That is why the *Problem Statement* is expected to flow, quite logically, from the *Background to the Study*; and it is not a good *Problem Statement*, one that fails in this; since they are not supposed to be two separate entities, as it were. It is however different from *Background to the Study* in that it must be stated quite briefly and very clearly. All the illustrative components of the *Background to the Study* would have served to enable one go straight for the specifics under the *Problem Statement*.

This is why experienced supervisors would insist that the *Problem Statement* should be in the range of one to three paragraphs only. The belief is that the shorter, the clearer; and the clearer the better for the entire investigation process. In short, one cannot over-emphasize the need to state the problem very clearly and precisely, since the whole process of the investigation depends on it.

Durotolu {2001} puts it succinctly when he remarked that "if the problem is not well defined/stated, the researcher may be working on the wrong issues, may design, develop and use inappropriate samples and instruments, and may even engage himself in studying an inconsequential issue". He advised that the language here should be definite and quantifiable; since once this is done, the type of research, the approach and procedures to use are often a matter of simple logical deductions.

Thus, there is no doubt that an adequate statement of the research problem is the most important part of a research process. The simple reason for this assertion is that the entire process of investigation hinges on it and it is usually related to some of the following namely: -

i. A missing link
ii. An imbalance
iii. A need
iv. An unsatisfactory state of affairs
v. An unanswered question.

Thus, the *Problem Statement* gives direction to the rest of the project; indicating and highlighting the main variables of interest to the researcher as well as the specific relationship between them.

1.3 Research Questions and/or Hypotheses

Usually, these come immediately after the *Problem Statement* because of their strong relationship. *Research Questions* are a form of elaboration/ extension of the *Problem Statement.* They do not only seek to convert the declarative statement of the problem into interrogative form, but further break down the main issues compressed in the *Problem Statement*. As its name implies, *Research Questions* come in the form of interrogations seeking to establish definite relations among the key variables of investigation.

Besides, the *Research Questions* normally serve as the basis from where the questionnaire items/questions would eventually be derived. The difference between the two is that the questionnaire items give a further breakdown of each of the research questions to a greater detail. This is to the extent that a single research question can produce the range of between three to five questionnaire items/questions. Whereas the *Research Questions* are broad in nature, the questionnaire items are usually directed towards the specifics thereby getting down to more details.

As for the *Hypotheses,* they are not the same as *Research Questions* even though they sometimes substitute each other. In other words, it is not uncommon to find projects which have both as well as others which have only one of them. Because they are not the same, they are not expected to duplicate each other. If they stand to do that, then one should be retained and the other disposed of. By this token, one can easily understand that it is not compulsory that a project should have both; especially at the elementary level, where in most cases, the research questions would be enough.

By definition, a *Research Hypothesis* is a clear, definite statement whose authenticity and workability can be subjected to test through the scientific method. As a declarative statement of prediction, it seeks to establish the relationship or difference, which exist between one variable and the other(s); and to what extent. It is a kind of intelligent guess or assumption usually derived from the outcomes of previous research and/or theories emanating from the literature. *Hypotheses* are formulated on the basis of any of the following areas and objectives namely: -

i. To simply describe a phenomenon or a statement of fact
ii. To compare two or more concepts, people and places
iii. To show the relationship between variables
iv. To show a cause/ effect situation between variables.

Generally, there are two types of hypotheses; simply referring to the way they are stated. These are the *Null* and the *Alternative*. Whereas the former is usually stated in the negative form of *No Significant Relationship* or *No Significant Difference* etc., the latter takes the positive form of statement; such as *There is a Significant Relationship, There is a Significant Difference* etc.

The *Research Hypotheses* set out the basic issues relating to the data to be gathered in the course of carrying out the research. They serve as a theoretical conceptualisation of what and how the researcher anticipated in terms of his research outcomes. They assist him to test and verify his ideas on the basis of which he makes very concrete and dependable conclusions and generalizations. They also help him to sharpen his focus on the research problem with a view to determining the direction where to find the solution. Thus, some of the qualities of a good hypothesis as contained in Durotolu {2001} include the following: -

i. It should be reasonable {i.e. intelligent guesses}.
ii. It should be consistent with known facts or theories.
iii. It should be stated in such a way that it is testable and found to be probably true or false.
iv. It should be in very simple, unambiguous terms.
v. It should be directly related to the problem of investigation.
vi. It should involve very few variables at a time.
vii. It should be quantifiable {i.e. operationally formulated}.

1.4. Objectives {Purpose} of the Study

Just like every other thing in a research project, the *Objectives of the Study* is closely related to the *Research Problem.* The former derive directly from the latter. The *Objectives of the Study,* sometimes referred to as *Purpose,* represent the aims of conducting the investigation and could be categorized into broad and specific.

The broad objective states the overall aim of a research project whereas the specific objective is concerned with the detailed list of intentions about what the research stands to achieve at the end of the exercise. Usually, the specific objectives are stated in the form of declarative statements of the research questions. This means that while the *Research Questions* take the interrogative statement form, the *Objectives* present the same thing, but in the statement form.

1.5. Significance of the Study

It is expected that every research project must have something new to contribute to knowledge in that subject area, however small. As a matter of fact, no research should take place if it will not contribute anything to knowledge; as this represents the hallmark of all research endeavours.

Therefore, this segment is expected to explain the likely benefits of the research and to whom such expected benefits would be meant. All these should be clearly stated. In any case, there is no hard and fast rule as to the number of benefits that a research project should have or its length. It can be serialized/itemized or paraphrased depending on the individual's style of writing.

1.6. Scope and Limitation of the Study

The scope of the study simply refers to the extent of coverage of the subject matter being investigated and the proper statement of the problem will serve as a useful guide to doing this. In other words, if the problem had been properly stated at the on-set, it assists, automatically, in defining the scope of the research. That is why the scope of the study is partly a function of the title of the research project. If well formulated, the expression of the title alone does define the scope of the study and perhaps, needs a little rider to make it clearer. The limitation of the study represents the other side of the coin.

Therefore, if the scope was concerned with the extent of the study's coverage, then, limitation means building a fence around the subject of investigation. This is with a view to establishing a basis for the non-inclusion of certain things in the study for obvious reasons.

To limit one's study is quite essential if the study must be focussed and yield expected results. This fence-building exercise helps the study to have and preserve its own identify; thereby helping the researcher to avoid the interference of extraneous, factors, which were not intended to be part of the study from the beginning. *Scope and Limitation of the Study* are therefore like the two sides of a coin; in that one explains what is included in the study while the other is concerned with what was not intended to be included.

1.7. Basic Assumptions

Although many tend to confuse *Assumptions* with *Hypotheses*, it is important to state very categorically that they are not the same. We have already talked about hypotheses; what they mean and their significance in a research project. Now, *Assumptions* are just mere statements, which are

often, not subjected to any testing. They are, more or less, mere statements that are taken for granted. They cannot take the place of *Hypotheses*; yet, they tend to duplicate the *Hypotheses,* because they are quite similar.

It is for these reasons that many have suggested that if the study has hypotheses, then assumptions would no longer be necessary. For a study with *Research Questions* only however, it is advisable to have assumptions, to serve as a guide towards the realization of the research objectives. Assumptions are usually itemized while the number varies.

1.9 Operational Definition of Terms

This segment of the *Introduction* is used to provide a sort of working definition to all the items, which would be operationally used in the course of the study. The idea is that there are some terminologies, which have been "adapted" and so used restrictively for the purpose of the research project.

This means that such terminologies would mean something slightly different from the one adapted under a different situation; hence the name *Operational Definition of Terms*. In defining terms operationally, individual terms/words to be so defined are identified and then itemized. Thus, operational definitions are usually given in such a way that will suggest that they are not the generally accepted or standard definitions but those peculiar to the study in particular. This segment usually comes last in the opening chapter.

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REVIEW OF RELATED LITERATURE

Introduction

There is no doubt that the literature review is an important aspect of any research project. As its name implies, literature review involves the collation of ideas, views, positions and opinions, expressed in the writings of recognized authorities as well as findings of previous researchers in one's area of investigation {Issa, 2003}.

Similarly, Akinwumiju {2000} describes the review of related literature as involving the systematic identification, location and analysis of documents containing information related to the research problem. It aims at providing information about what had already been done; how they were done and with what results.

One of the very early activities in any research investigation is the review of related literature. By this, we refer to the body of research information relating to the present research. All the necessary information needed to put the research in proper context once the research problem has been identified and formulated would derive from the literature review.

Until this had been done, the research cannot proceed effectively considering the great amount of information to be sought from a variety of sources-primary and secondary-there is no doubt that the review of related literature is a serious task deserving an equally serious attention. As a result of this, literature review has been considered as "a systematic process that requires careful and perspective reading and attention to detail" {Akinwumiju 2000}.

Thus, its goal is to determine what others have learnt or done about similar research problems and to gather information relevant to the current research problem. The *Chapter Two* of the research project is usually devoted to it. Basically, it serves three purposes namely: -

i. To set the theoretical framework for the research project.
ii. To establish the present research efforts within the mainstream of other related ones previously conducted.
iii. To determine the *state-of-the-art* in that particular area of study.

How To Determine the Quality of Literature Review

To determine the quality of literature review on any given topic, it is necessary to provide answers to the following questions namely: -

i. How wide {or otherwise} is the scope of the literature reviewed?
ii. How up-to-date are the materials/studies reviewed?
iii. How relevant are the materials reviewed to the subject of the present investigation?
v. How well organized is the entire literature review?
vi. Has it such things as introduction, subheadings, summary and appraisal of reviewed literature?
vii. Is it possible to present a summary of the entire review in a paragraph of few sentences?

The Requirements of a Good Literature Review

To be able to carry out a good work of literature review, one is expected to demonstrate the following abilities namely: -

i. The ability to find relevant sources quickly.
ii. The ability to peruse so many sources quickly.
iii. The ability to identify, for further use, all relevant materials contained in the sources perused.
iv. The ability to interpret and organize information accumulated from the various sources consulted.

To this end, Osuala {1993} identified seven (7) specific procedures as the means by which a good literature review can be carried out successfully namely: -

i. Getting a clear picture of the subject under investigation
ii. Orientating oneself toward the empirical research done in the broad area in which the problem lies.
iii. Demonstrating a good ability of reading at a high rate of speed.
iv. Searching for library sources in a systematic and thorough manner.
v. Taking notes systematically in the light of such criteria as uniformity, accuracy and ease of assembly.
vi. Taking as complete notes as he might need.

vii. Recording references on 3x5 cards, each carrying labels of topic or topics.

Opeke {1995} quoting from Casteller and Heisler {1977} enumerated the functions of a good literature review to include the following namely: -

i. To study the history of the problem.
ii. To aid in the selection of investigative procedure i.e. methodology.
iii. To become familiar with the theoretical background of the problem.
iv. To assess the merits of previous studies.
v. To avoid unintended duplication.
vi. To justify the selection of the problem.

By and large, a good literature review enables the researcher to understand previous studies; and to determine the adequacy or otherwise of their design and methodologies and to sharpen his own research focus.

Necessary Preparations for Doing a Good Literature Review

The need to spend time to prepare for a good literature review is borne out of the fact that the initial time spent will save one's time in the long run. Hence, before starting on literature review, you are advised to do the following: -

i. Find out what references are available.
ii. Where and when they could be found.
iii. Get familiar with library sources within your vicinity.
iv. Know the rules and regulations guiding the use of the library.
v. Make a list of key words relating to your research topic so as to guide your literature search.

Guidelines for Carrying out a Good Literature Review

Re-read all notes made during your search exercise so as to refresh your memory and get rid of some works that may no longer seem sufficiently related to your study. The following guidelines would help: -

(i) Make an outline of all the materials you have consulted.
(ii) Examine each of the materials with regards to your outline such as to enable you sort out your references into appropriate piles.
(iii) Take a list of the references identified for a given subheading and examine the relationships and differences between them.

(iv) Ensure that the review flows in such a way that the references that are not too related to the problem are discussed first, and the most related ones come last.

(v) Conclude your review with a brief summary of the literature and its implications for your own study. This is usually referred to as *Appraisal of the Literature Review.*

Things You Must Not Do When Reviewing Literature

For you to achieve a good review of related literature in your field, you need to take note of the following things when reviewing literature: -

(a) Do not be in a hurry to do literature review just to get started in your research project. If you do, then you are more likely to over-look previous studies containing ideas that would have helped to improve your work.

(b) Avoid the temptation to over-depend on secondary sources at the expense of primary sources. Whereas the former refer to materials, which contain account of events/phenomena by one who was not a witness to them, the latter contain direct accounts of events by the witness.

(c) When reading research articles, avoid the temptation of concentrating on research findings at the expense of valuable information on methods, measures etc.

(d) Avoid being too broad or narrow in your literature search as both have obvious disadvantages

(e) Ensure that the bibliographic data {references} concerning the materials being reviewed are not wrongly copied. Otherwise, it becomes difficult, if not impossible, to locate the materials.

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RESEARCH METHODOLOGY

Introduction

Usually research methodology comes up in *Chapter Three* of the research project. Its purpose is to provide a detailed explanation on the procedures to be used in carrying out the research; that is, the master plan, to be followed in the conduct of the study. Usually, this chapter takes the form of the following outline: -

3.1. Introduction.
3.2. Research Design/Method.
3.3. Population of the Study.
3.4. Sample and Sampling Techniques/Methods.
3.5. Instruments for Data Collection.
3.6. Procedure for Administration of Instruments.
3.7. Data Analysis Procedure.

3.1 Research Design/Method

After opening the chapter with an explanation of what it sets out to do using the outline above, next is to explain the research design, which is also known as *Research Method*. That is, what kind of research is it, having known the various types of research (See *Chapter Three*). If it is a *Survey* or a *Case Study*, for instance, say so and describe it, first, generally, and then, with particular references to your work. This becomes important in view of the fact that the rest part of the chapter depends on the nature of your research, which would have been clearly described here.

3.2 Population of the Study

The study's population sets the limit within which the research's findings would be applicable. *Population* is a technical term used in research to describe that group, which may be of people, animals, or things, from which the researcher intends to draw his study's sample. In other words, *Population* refers to all the members or elements of a particular group of people, animals, or things in a defined area. It simply refers to the totality of the "research subjects" in a given research situation. To state the population of a study very clearly therefore, there is the need to have factual figures on the number constituting the study's population as this will have a direct implication for the sample and the sampling process.

3.3 Sample and Sampling Techniques/Methods

Once the study's population had been adequately and appropriately determined under 3.2 (above), it becomes easy to draw out a *Sample* there from. *Sample*, in research, refers to that group of the study's population from which necessary data for its conduct would be obtained. In other words, it represents a smaller group of the elements or members, drawn through some definite procedure from a specified population.

It is the *Sample* that will be studied and not the *Population*, while the outcomes resulting from the data obtained from the *Sample* can be generalized for the population. This is because, some even believed that such outcomes of a carefully planned and well-executed *Sample* stand to be more accurate than those from a *Population*. Durotolu {2001} found justification for this position in the statement that: -

> *Studying a complete population involves a huge and unwieldy organization so that most of the errors that would normally occur here cannot be controlled easily. Also, using a complete population may not satisfy the particular needs of individual disciplines. In a sample, it is possible to estimate the margin of error and decide whether or not the results are sufficiently accurate*.

As for the *Sampling Techniques/Procedure*, they depend largely on the type or method of sampling adopted; which in turn, is a function of the extent to which generalizations can be made about a particular population. Some of the common types of sampling methods/techniques include: -

i. Random Sampling.
ii. Systematic Sampling.
iii. Stratified Sampling.
iv. Cluster Sampling.
v. Purposive Sampling.

Random Sampling

As can be deduced from its name, this type of sampling guarantees every member of the population, equal opportunity/chance of being chosen; to the extent that the choice of any one member does not at all, affect that of another. Its procedure is that the population being sampled is numbered so that random numbers are picked from the random number table. Besides, it

can be done by tossing the coin; throwing the dice; balloting with the use of slips of paper or even by the use of computer.

Systematic Sampling

This sampling technique seeks to offset inherent inadequacies associated with the *Random Sampling* method particularly as it relates to area of coverage. The procedure is also simple and straightforward. After choosing any particular member/element of the population, make a decision on what interval to use in making the remaining choice subsequently.

In taking the decision, it is necessary to ensure that the intervals are regular; noting also that the interval size is directly linked with the sample size. Although this method ensures a wider coverage, its technique of the first pick determining the subsequent ones runs short of the assumption of independence, which affords every member equal chance. That is, the practice of using the first number picked to determine what subsequent ones would be picked denies some members of the group their right of being picked as others.

Stratified Random Sampling

This type of sampling method seeks to recognize the various strata of a study's population especially in heterogeneous population. In this case, the population is divided into strata using some criteria before a decision on the number of members to be chosen from each of the strata is taken. Note, however, that the strata do not contribute an equal number for the sample but a number in proportion to the expected or known sizes of these strata in the population.

Thus, the method serves best when the population is not homogeneous as in the population of a city, which contains different age groups, different social and economic circumstances; racial areas, gender types {Aina, 2002}. However, it does not require that the sampling fraction should be the same within each stratum; though where there is a uniform sampling fraction, it is referred to as a *Proportionate Stratified Sampling*.

This means that the sample size from a stratum is proportional to the population size of the stratum. Better still, that the total sample size is allocated between the strata by proportionate allocation. If the sampling fractions vary, then the sample is referred to as *Disproportionate Stratified Sample*.

Cluster Sampling

This is a sampling technique, which involves dividing a population into groups or clusters, from which a sample of the clusters is drawn. From the selected sample clusters, it is expected that all members of each cluster are either selected or a sample of individual constituents is again drawn from each of the clusters. In using this sampling technique, there is the need to ensure that all the constituent parts of the cluster are adequately represented.

This means that the heterogeneity of the cluster's units must be ensured while ensuring also that the characteristics of the clusters themselves are similar. This becomes particularly important in the event that all members of each selected cluster need to be included in the final sample. The technique helps greatly to reduce the field costs of conducting a research, which covers a wide subject area.

Purposive Sampling

This is a technique in which the researcher, based on his knowledge and understanding of the population, handpicks certain groups or individuals for their relevance to the subject of investigation. Considering that the method was determined primarily by a particular purpose, which the researcher has in mind, it can be considered then, as a judgemental form of sampling. Its major advantage lies in the fact that it gives a great possibility for the participation of those considered very crucial to data collected in a given study. However, those selected are not likely to be representative of some clearly specified population of more general interest.

3.4. Instruments for Data Collection

There are a number of instruments that could be used for collecting data in a research situation. The type (s) of instrument (s) used, however, depends on the nature of the research and the type of data to be collected. Usually, a combination of instruments is used in collecting data for a particular research project. This is with a view to upsetting inherent limitations in one with the other.

Durotolu (2001) underscored the essence of data collection instruments to the conduct of research investigation in the following statement: -

> *Any meaningful research requires pertinent data since such data are necessary for finding solutions to the research problems. In essence, the strength and viability of any research will be determined by the*

> *type of data collected and the mode of collecting them. The process of data collection in a research demands careful planning by the researcher; he has to decide on the type of data he should collect, the place where such data may be collected, and then the instruments that will be appropriate for the exercise.*

Some of the common instruments used for data gathering in research include: -

i. Questionnaire.
ii. Interview.
iii. Observation.
iv. Documentary Sources.

Questionnaire

This is a common data-gathering instrument among researchers. It consists of set questions for submission to a number of persons otherwise known as respondents, used for collecting relevant data in a study. It sets out to gather factual information in an enquiry form through which respondents answer questions or respond to statements in writing.

Questionnaire can be categorized as *Close/Structured* and *Open/ Unstructured*. When structured/closed, respondents are provided with alternative answers from which they will select one or more answers depending on the way the question was structured. On the other hand, they are unstructured or open-ended when they require free responses in the respondents' words and style. This type is designed to permit free responses from participants rather than those limited to specific alternatives. It is common to find both the structured and unstructured designs in one questionnaire, each with its set objectives.

Qualities of a Good Questionnaire

A good research questionnaire is expected to have certain characteristics, some of which include the following: -

i. It should have an introductory letter to state, explicitly, the objectives and significance of the research and the instrument.

ii. Items must be as short as possible and only long enough to get the essential data.

iii. Its appearance should be attractive by being neatly arranged and clearly duplicated or printed.

iv. Each item of the questionnaire should deal with a single idea and worded as simply and clearly as possible.

v. The questions must be objective and not suggest any lead as to the responses desired.

vi. The questions must be set up in such a way as to start from the general to the more specific. This is to enable respondents organise their own thinking logically and objectively.

Interview

The *Interview*, as an instrument, is quite similar to the questionnaire in a number of ways. This is to the extent that, in a sense, it has been described as an oral questionnaire since the respondent/interviewee does not have to give written responses. Instead, he provides needed information orally, and face-to-face or through telephone.

By its sheer nature, Interview allows for the collection of first-hand data as well as for a greater depth of response from the respondent. Like the questionnaire, *Interviews* are of two categories namely *Structure/Close* and *Unstructured/Open*. When the questions to be asked at the interview session have been listed in what is called an *Interview Schedule*, such is considered as being structured. In that case, the interviewer will be guided by, as he adheres strictly to, the questions listed in the schedules.

On the other hand, an *Unstructured Interview* is open-ended and allows for freedom of both questions and answers. It is more flexible than the structured one as further probing questions not listed in the *Interview Schedule* could be asked. Thus, the structured interview will be more appropriate for quantitative research whereas the unstructured one will serve the qualitative research better. Regardless of the designs, a great deal of communication, human relations and recording skills are required on the part of the interviewer for the exercise to be effective.

Observation

Although *Observation* is sometimes considered as a research method, it is hereby categorized as a data collection instrument; as it is used for the purpose of collecting data. As a data collection instrument, it can be used in

virtually all research situations. There are two categories of *Observation* namely *Participant* and *Non-participant*.

Whereas in the former, the researcher is directly involved in the data collection exercise through observation, in the latter, he does not directly participate in the exercise. *Participant Observation* is usually structured while the *Non-participant* is structured. *Observation* is often used as a data collection instrument, to complement the use of other instruments. In that case, it is used to cross-validate certain responses from either the questionnaire or the interview.

For *Observation* to be effective, the observer should record his observation on the spot and have a good safekeeping of the records of his observations. Its results can be integrated into the report of the study's findings during the presentation of data. The most convenient way of using *Observation* as a tool for data collection is to have a checklist. A checklist is a list of all possible behaviours, for example, that could occur during a particular event/phenomenon being investigated. Against each item in such a list, the observer scores or rates his observation. In recording observations, it is important that it does not distract or create a barrier between himself and those being observed.

As a data-collection instrument, *Observation* demands rigorous adherence to the tenets of scientific enquiry. It is important that the researcher plans the observation exercise carefully and systematically, knowing what to look for and what is irrelevant in a situation. He should be objective, recognising likely biases thereby eliminating undue influences on what distinguishes between the facts from their interpretations. It is therefore necessary that they observe the facts and make their interpretations at a later time. The observations should be carefully and expertly recorded, once they have been collected in a valid and reliable way.

Documentary Sources

This is not a particularly common instrument for data collection in research. It becomes an important means of data gathering only when experimentation is not possible. *Documentary Sources* are usually categorized into primary and secondary sources where the former consist of original materials such as official or personal documents, which are records containing firsthand information. Eyewitness accounts, personal papers, archival records, local government publications, autobiographies and memoirs, collected speeches and contemporary articles are typical examples of the primary sources.

On the other hand, secondary sources are records or accounts prepared by someone else other than the person or persons who were participants/ observers of an event. They consist of testimonies of individuals who were not eyewitnesses, but who prepared records of the events for one reason or the other. Examples here include news, stories and feature articles in newspapers and periodicals, written accounts of related events like committee meetings, hearings, board deliberations, dedication, ceremonies, memorials, etc. particularly when they were written by participants in the activities. Critical to documentary sources as an instrument are the following: -

i. Being able to know whether or not a reasonable amount of evidence exists.
ii. Where existing evidence could be located?
iii. How accessible are such existing evidence?
iv. How genuine and reliable are the evidence?

3.5. Procedure of Administration of Instruments

This refers to the process by which the research instruments are administered for the purpose of data collection. Although a better part of this process had been discussed alongside each of the instruments, there is a general aspect of this that needs to be discussed still. It involves the explanation on how the researcher intends to carry out the exercise of data gathering on the field.

Issues such as determining how long data collection exercise will take; whether or not research assistants and/or interpreters would be needed; and the period of contacts between him and the respondents are central to the procedure for administering research instruments. Spelling out in clear terms how these would be accomplished represents the dominant discussions in this segment.

3.6. Data Analysis Methods/Procedures

This last segment of *Chapter Three* is usually devoted to explaining how the researcher intends to present, analyse and interpret the data that would accrue from the administration of the instruments on respondents. That is, when the data had been collected, how he intends to set out analysing them. One important point to note however is that there is no one single analysis method to be considered as best for all research situations. It means therefore that the kind of analysis method and procedure chosen for a particular research will depend largely on the kind of research in question.

Also, that the data analysis method and procedure have a direct relationship with the kind of data collected and the kind of instrument (s) employed in gathering the data.

By and large, data analysis will involve the use of statistical methods as may be considered appropriate for a particular research. There is also the non-statistical method of analysis, which is generally referred to as the *Descriptive* method of analysis. An in-depth discussion of what data analysis method to use and how to analysis the data gathered provides a smooth transition from *Chapter Three* to *Chapter Four*, where the data is presented, analysis discussed and interpreted.

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DATA PRESENTATION, ANALYSIS AND DISCUSSION

Introduction

This comes up, usually, in *Chapter Four* of the research project. This is where the researcher presents the data collected from respondents though not in the raw form. In their raw forms, it is quite difficult to present and analyse data, which is why there is a need for the raw data to be organized and presented in more compact forms. Subjecting the data to tabulation, grouping or even graphic forms, so as to allow for easy handling and analysis, could do this.

In doing this, the chapter sets out on an introductory note often referred to as "*Preamble*" where the researcher provides useful background information on the respondents' group (s), their characteristics with respect to their bio-data and the rate of returns of the data gathering instruments.

After this, he moves on to the main theme of his research by presenting necessary data in the form (s) considered most appropriate for the purpose of analysis. If, as an instance, the tabular mode of data presentation was used, the tables should be well titled; each followed by detailed explanation on the data presented. This pattern should be used for each of the tables presented. Also important under data analysis is the *Discussion of Results* segment.

This comes up, normally, after the entire presentation exercise had been concluded. It is the segment where the researcher gives a more detailed insight into the issues directly relating to the data presentation and analysis. The segment helps to articulate the issues emanating from the data analysis with respect to whatever implications they have on the subject of investigation.

If the study is concerned with hypotheses testing, it is in this segment that the implications of the outcomes of the tests as they relate to the subject of research would be explained. Here also, conclusions on the relationship of the outcomes of the present study with previous ones are drawn; with a view to establishing a link between the outcomes of the present study and those of previous studies as already established under the literature review. Further more, the researcher dedicates a part of this segment to interpretation of the outcomes of his findings, thereby giving more meaning and sense to the data analysis exercise.

The Use of Statistics in Data Analysis

Sulaiman {1997} defined the term statistics as "a branch of applied mathematics, which is employed in analysis of data to facilitate meaningful decision making." It is also described as the theory and methods of analysis obtained from samples of observation in order to compare data from different empirical observations using hypothesized relationships in order to make meaningful decisions.

Even then, the methods of data analysis depend on the aims and objectives of the study and the nature of the data gathered. It becomes clear from the above, that statistical analysis could be useful for: -

(i) Reducing quantities of data to manageable and understandable form.
(ii) Aiding decision making
(iii) Summarizing samples from which they are calculated
(iv) Aiding reliable references and decisions from hypothesis

Statistics thus serves as a tool used in collecting organizing, analysing and interpreting data. Generally speaking, statistical methods are categorized into broad classes of *Descriptive and Inferential Statistics*. *Descriptive Statistics* are often used to summarise the data collected, while *Inferential Statistics* are used to determine the generalizability of findings arrived at, through the analysis of a sample, to the larger population.

Note that *Descriptive Statistics* can be used for both sample and population data but cannot be used to perform inferential tests on population data. This is because the results obtained from descriptive analysis are definitive enough for the population of interest. The application of either *Descriptive* or *Inferential* statistics to a set of data largely depends on the levels or scales of measurement of underlying variables. In all, there are four (4) levels of measurement otherwise known as scale. These are: -

i. Nominal Scale.
ii. Ordinal Scale.
iii. Interval Scale.
iv. Ratio Scale.

Brief discussion on these four (4) levels of measurement will contribute to better understanding of the uses of statistical methods on data analysis. Hence, the following: -

Nominal Scale

This is considered as the simplest and the least refined scale of measurement; one whose primary use is to provide a labelling function. A good example of this is the individual's sex, which can be either male or female. There cannot be any other thing between these two. The *Yes* or *No* kinds of questions are also good examples of this. However, it lacks the property of order and magnitude.

Ordinal Scale

This kind of measurement also performs the labelling function apart from its ordering function. This is because it possesses the property of order and magnitude such that two things could be compared in terms of their relative magnitude. A good example of the *Ordinal Scale* relates to the degree of agreement with a statement such as *Strongly Agree*, *Agree*, *Disagree*, and *Strongly Disagree*. Using this scale to measure two units, one will be able to determine which is higher or lower and not just that they are not the same.

Interval Scale

This also has the property of order, magnitude and additivity since equal intervals on the scale represent that there is a difference with a magnitude. The scale does not posses absolute zero because the zero is arbitrarily set. In addition to its ordering function, this scale can be used to determine the difference between two units. Measuring the temperature of a room in *Celsius and Fahrenheit* is a good example of this scale.

Ratio Scale

This scale is the highest level of measurement because it has an absolute zero. As a general rule, whatever statistical methods are applicable to variable measured in the nominal scale can be applied to those measured in ordinal and interval/ratio scales. Similarly, those statistical methods applicable to variables measured in ordinal scale can also be applied to those measured in interval/ratio.

There are, however, statistical methods that are applicable to variables measured in interval/ratio that could not be applied to variables measured in the nominal scale. Some examples of the ratio scale include *weight, time* and *speed*; thus possessing all the properties of the other scales.

Procedure and Tools for Data Analysis

In data analysis, there are procedures and tools to be employed depending on the type of research as well as the nature of the data to be analysed. Regardless of the instruments/methods used in data collection, and whether the data is from sample or population, the first step in data analysis is to describe the collected data. To do this, however, the data should be summarized either using a frequency table or chart. These two are veritable tools for presenting and communicating data in such writings as technical reports and journal articles.

The Frequency Table

There is no doubt that with the *Frequency Table*, the researcher can display the number of cases, which have each of the attributes of a given variable. It also serves to display both qualitative and quantitative data. When confronted with the number of attributes or categories of a variable that is too large, the *Frequency Table* adopts the grouped data approach by combining the attributes into classes.

E.g. with *Age* as a variable, the *Frequency Table* may present data as: -

20-24
25-29
30-34
35-39
40-44

The Charts

Just like the *Frequency Tables*, there are also *Charts*, which serve similar purposes. The two most commonly used *Charts* are the *Pie* and *Bar Charts*. That is, both could be used to present data summaries and also used to interpret and convey the message more quickly, concisely and clearly than frequency tables. Their great limitation however lies in the fact that they hardly cope in situations where the attributes of a variable to display are too many, especially when these are more than nine.

This is particularly so for *Pie Charts* which are quite useful in providing vivid picture of data but only in showing the distribution of variables with single responses. Thus, they are inappropriate tools for variables associated with multiple responses from the units of the study. Also, while they are most applicable for qualitative data, *Pie Charts* also

serve to display quantitative data particularly those whose number of attributes or categories is not more than five.

As for the *Bar Charts*, they serve for qualitative data in particular, irrespective of the nature of the responses to the variables, either single or multiple. Since *Bar Charts* make it easier to compare the categories of a variable, they are more suitable for displaying data with more than five categories. They also serve to display quantitative data, particularly, the variable presented in a discrete fashion. However, *Histogram* remains the more appropriate tool for displaying continuous variables.

Measures of Central Tendency

This is another approach to describing a set of data, considered useful in determining a typical attribute/value of a variable. The measure is also useful in comparing the performances of two or more groups or the performance of a group over two or more periods of time. The *Mean, Mode and Median* are the three most common *Measures of Central Tendency*.

The Mean

The *Mean* is the arithmetic average of a set of data usually applicable to quantitative data. To obtain the *Mean*, sum up all the scores in a set of data to be divided by the number of scores. With the distribution of the variable that is skewed, however, the *Median* will better represent the distribution, as extreme values tend to increase or decrease the *Mean*.

The Median

The *Median* is considered as the middle value in a set of data when all the values are arranged in order of magnitude. In other words, the *Median* tends to show the grouping together of scores around a central point, dividing a set of data into two main parts. In short, the middle scores between the upper half and the lower half is the *Median*. Although the *Median* is most appropriate for *Ordinal Data*, it is also applicable to *Ordinal, Interval and Ratio Data.*

The Mode

Meanwhile, the score, which has the largest frequency in a set of data, is referred to as the *Mode*. It refers to the most common attributes or value of a variable in which case it is possible for a set of data to have more than one *Mode*. Although most appropriate for *Nominal Data*, the *Mode* is also applicable to all types of data.

Measures of Variability

This is also known as the *Measures of Dispersion* in which a measure of variation or dispersion is calculated primarily to determine the homogeneity of a set of data. There are separate measures of variation for qualitative and quantitative data. For quantitative data, measures of variation include: -

(i) The Range
(ii) Standard Deviation
(iii) Variance or the Square of the Standard Deviation
(iv) Coefficient of Variation

The Range

This refers to the difference between the highest and lowest attribute or value. Its primary objective is to give the researcher an idea of the data spread to determine the range for a grouped data, minus the highest limit from the lowest limit. Thus, the range is solely based on the two extreme values and fails to recognise how the data are actually distributed between these two values. Hence, the desirability of *Standard Deviation* to offset this inadequacy.

Standard Deviation

This is defined as the distance or the average deviation of all values from the *Mean*. The difference between each *Score* and the *Mean* is the *Deviation Scores* from the *Mean*. The bigger the *Deviation*, the more variable the set of *Scores*. The *Standard Deviation* is obtained by taking the square of the average of these deviations and divided by the number of *Scores*. Thus, it is an indication of the typical deviation of the values from the *Mean*. If the *Standard Deviation* is small, the group is considered homogeneous whereas a large *Standard Deviation* is an indication of a heterogeneous group.

Variance

This refers simply to the square of the *Standard Deviation*, obtained by subtracting each observation from the *Mean* **(*x*)**, squaring the resulting difference (*Xi -X*) to eliminate negative signs of *Deviation*. They are added up to give the *Sum of Squares* (*Xi-X*) and finally dividing it by the number of observation '*n*'.

Coefficient of Variation

This is the *Ratio* of a distribution's *Standard Deviation* expressed to its *Mean*, multiplied by 100, and is independent of the unit of measurement. *Coefficient* of *Variation* is employed when comparing the *Variability* of two sets of data particularly when they are expressed in different units of measurement.

Statistical Hypothesis Testing

Unlike the general discussion on hypotheses as earlier on presented, the topic is being re-visited here (under data analysis), with particular reference to *Inferential Statistics*. By *Inferential Statistics*, we refer to drawing conclusions regarding the *Population of the Study* based on the information obtained from the *Sample*. It means that this kind of *Statistics* will not be relevant in situations such as when one is working with *Population Data* and when one is not interested in making a general statement about the *Population*. At the centre of *Inferential Statistics* is the concept of *Hypothesis Testing*. This refers to the process whereby the research infers from a sample whether or not to accept a statement about the *Population*; where the statement itself is the *Hypothesis*.

Hypotheses are stated either in the *Null* or *Alternative* forms for the researcher to validate; even though that the *Null Hypothesis* remains the more commonly used of the two. As a matter of fact, it is always the *Null Hypothesis* that gets tested and it is mainly on the condition that it is rejected that one can accept the *Alternative Hypotheses*.

When testing *Hypotheses*, the maximum probability with which one may be willing to reject the *Null Hypothesis* is referred to as the *Level of Significance*. It is common practice to use an alpha level of *0.05* or *0.01*; meaning that there are 5 or 1 of 100 chances of committing *Type 1 Error*. When the *Reject Decision* has been made at *0.05 level*, it means that the outcome of the experiment is statistically significant at the *0.05% level*.

The procedure, which enables one to decide whether to *Reject* or *Accept Hypotheses* or to determine whether observed *Samples* differ significantly from expected results is differently referred to as *Test of Significance, Rules of Decision, or Test of Hypothesis*. Thus, if against the assumption that a particular hypothesis is true, we find results observed in a random sample differ markedly from those under the hypothesis, we then conclude that the difference is *Significant*. On this basis, we can *Reject* the *Null Hypothesis*. *Errors* are sometimes made in *Hypothesis* testing and these have been categorized into: -

(a) Type 1 Error
(b) Type 11 Error

In a situation where we *Reject* the *Null Hypothesis* when, in fact, we should *Accept* it, it is said that we have committed a *Type 1 Error* of decision or judgement. On the other hand, if we *Accept* the *Null Hypothesis* when we should, indeed, reject it, we are said to have committed *Type 11 Error*. Such errors usually lead to wrong decisions.

To have a good *Test of Hypothesis*, there must a design to minimise these errors of decision. A sure way of doing this is to increase our sample size, since the larger the *Sample Size*, the less the possible errors. Some of the several kinds of *Inferential Tests* often employed in the analyses of data include: -

(a) T-Test
(b) Analysis of Variance
(c) Chi-Square
(d) Correlation and Regression Analyses

T-Test

This is normally used to compare the *Means* of two groups of data; which means that the data being compared should be quantitative. These two groups of data may be for two independent samples or may be for the same sample with the data collected at two different periods {i.e. paired samples}. If, based on the observed p-value, it is decided that the two groups are different, then, one should be able to state which group has the larger *Mean*.

Analysis of Variance

This *Test*, commonly referred to as *ANOVA*, is normally used to examine the effects of qualitative independent variables on a quantitative dependent variable. The *One-way ANOVA* is its simplest form and is used for comparing the *Means* for several groups. If, in the end, the *Null Hypothesis* is *Accepted*, it indicates that the *Means* for all the groups are the same. On the other hand, a *Rejected Null Hypothesis* indicates that not all the *Means* are the same even as it does not mean that they are all different. To ascertain which pairs of means are different, it becomes necessary to conduct a multiple comparison test.

Chi-Square

This kind of *Test* is often used to determine the existence of a relationship between two qualitative variables. Before applying the *Test* at all, a *Contingency Table* {Cross-tabulation} is usually formed to study the patterns of frequencies in the *Table*. If, at the end, the *Null Hypothesis* is *Rejected*, it means that there is a relationship between the two variables. It is after this that measures are used to determine the strength of the relationship

Correlation and Regression Analyses

These are used to study existing relationship among quantitative variables; and especially that between two quantitative variables. In particular, *Correlation Analysis* measures the strength of the relationship between the two variables, while the *Repression Analysis* develops an equation that enables one to predict the value of the *Dependent Variable* for different values of the *Independent Variable*.

These two methods are commonly used either as *Descriptive* or *Inferential* procedures. As a *Descriptive* procedure, a *Correlation Coefficient* is calculated to determine the strength of relationship between two variables. As an *Inferential* procedure, *Correlation Analysis* determines whether the observed correlation between the variables as determined from the sample can be generalized on the population.

The procedure requires that the *p-value* is calculated and used to *Accept* or *Reject* the *Null Hypothesis*. If the *Null Hypothesis* is accepted {i.e. there is no correlation between the two variables in the population}, there is no need to obtain a *Regression Equation*, as it cannot be used to predict the value of the dependent variable.

REFERENCE

Sulaiman, S. N. {1997} Statistics & Analytical Methods for Researchers. Kaduna. NDA Computer Centre.

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

Introduction

The presentation of a summary of the study's findings comes up, usually in *Chapter Five*, which is the last in the series. Its purpose is to provide an outline of the main and essential findings of the study devoid of the details already presented in *Chapter Four*. It opens on an introductory note; explaining this purpose in very clear terms. Its outline usually includes the following: -

5.1 Introduction.
5.2 Summary of the Findings.
5.3 Conclusions
5.4 Recommendations
5.5. Suggested Areas for Further Studies.

Summary of the Findings

A good presentation of the *Discussion of Results* in *Chapter Four* is of great essence and use to achieving a focussed *Summary of the Findings*. There is indeed a direct relationship between that segment of *Chapter Four* and the *Summary of the Findings;* as the former provides a good outlay of what will go into the latter.

Thus, *Summary of the Findings* is to be written in such a way as to provide answer or the results of hypotheses testing (as found by the study), to all the research questions and/or hypotheses; both of which must have been stated in the beginning or introductory chapter. It represents the main essence of what the researcher had done and found as a result of his investigations. This is usually presented in the form of itemization or listing; with each item corresponding to a research question, hypothesis or both, as the case may be.

Conclusions

The *Conclusions* are supposed to be a direct fall–out of the *Summary of the Findings*. This is to the extent that some even believe that conclusions are simply an extension of *Summary of the Findings;* since they derived there from. Whereas some set out their *Conclusions* in items form (i.e. numbering or itemizing them), as is the case with *Summary of the Findings*, many others present them in paragraph form.

Whichever the case may be, one important thing to bear in mind is that *Conclusions* must not be made outside of the context (i.e. the main findings) of the study at hand. In other words, the *Conclusions* should be solely and directly drawn from the subject of investigation and even more importantly, the study's major findings. In essence, the *Conclusions* of a study could be described simply as the researcher's understanding of the *Implications* of the study's findings.

Recommendations

This is also directly linked with both the summary of the findings and the conclusions already treated above. Precisely, recommendations are meant to serve as suggestions on how to improve the present state of affairs as revealed by the study's findings. The recommendations are expected to address salient issues, which might have been raised in the course of the investigation. hence, they should target the relevant segments of the society with a view to improving upon the existing practices in that particular area of study. Ogunniyi {2001} provides a guide as on what this segment focuses to include: -

i. The group of people or individual that was studied.
ii. The relations or family members concerned.
iii. The organization in which the project was conducted.
iv. Professionals in the field of focus of the research.
v. Other educationists and educational planners.
vi. Future researchers.
vii. Concerned leaders and interested individuals.

He states further that in making recommendations, it is important to clearly state the following: -

i. What is responsible for a state of affairs?
ii. How to achieve the desired states?
iii. What should be avoided?
iv. What should be rectified?
v. Who should play a particular role?
vi. How to improve a situation?
vii. The resources needed?
viii. How to initiate something?
ix. How to eradicate the undesirables?

Suggested Areas for Further Studies

While some research projects conclude on recommendatory note as discussed above, there are others, which come further to *Suggestions for Further Studies*. This segment is devoted to suggesting related and follow-up studies, which interested future researchers can consider. This is with a view to filling the gaps, which the present study left unattended to, as a result of its own limitations.

REFERENCE

Ogunniyi, M. B. (2001) Educational Management and Evaluation. Lagos: Longman Nig. Ltd.

PART 111

SOME ISSUES IN TECHNICAL PAPER WRITING

CHAPTER SIX

BIBLIOGRAPHIC CITATIONS AND REFERENCING STYLES

Introduction

Project and other forms of research report writings are largely technical in nature as had been explained and demonstrated in the preceding chapters. Parts of what constitutes this technicality could be found in the way citations and references are made. No project or any other research reports for that matter, can be written independent of what others have done previously on that subject.

After all, researchers are expected to build on previous efforts of others; to such an extent that what had been done in that area becomes the starting point for the present study. It was in reference to these previous efforts that the issue of bibliographic citation and referencing became very relevant and important.

Bibliographic Citations

At the centre of literature review lies the critical issue of using and referring to previous efforts in what area; what their areas of interest were, how they carried out their studies; what the outcomes were and so on. As much as it is permissible to *refer*, as it were, to these previous studies, research ethics demand that such referred works are duly acknowledged in the present work.

When such an acknowledgment is done in the body of the writing, it is referred to as *Citation* since what was done is *citing* their works. For every work thus *cited*, full *bibliographic details* must be provided on it at the end of the work. For the typical project work, there are options as to where the references are located; the first being to supply them, as they occur, at the end of each chapter. By such an arrangement, the work is expected to have five different sets of *References* - a set each to a chapter. The second option is to combine everything at the end of the entire report while the third is a combination of the two; in which case they are supplied at the end of the chapter, where they featured, while a *bibliography* is provided at the end of the work.

Meanwhile, there is just a little difference between *References* and *Bibliography* such that many tend to confuse the two. Whereas the term *References* refers to a list of works used in the course carrying out a particular research, *Bibliography* includes these as well as other works,

which in the judgement of the author have indirect benefits to the present effort. Thus, *Bibliography* is intended to draw attention to other related materials, not directly used in the present work, but considered to be of immense importance to other researchers who may be interested in related studies in the future.

By and large, the idea of *Bibliographic Citations* and *Referencing* has become one of a great significance in research works as well as in other technical writings generally. Their importance is central to *Literature Review* in a research as well as to the entire study. They enable researchers to acknowledge the materials, information, ideas, opinions, theories and others' findings, which had been consulted in the course of the present study.

By so doing, the individual researcher frees himself from the widely acknowledged, unethical and criminal practice in research popularly known as *plagiarism*. This is an offence bordering on copyright infringements where a researcher fails to acknowledge the intellectual properties of others he had used in the course of his own study.

Thus, using others' intellectual properties is not the offence here; rather, it is the lack of acknowledging the fact that what was used actually belongs to others. The act of *referencing* simply provides for this much-desired acknowledgment. This applies not only in project writing but in all cases of technical reporting and writings; such that it forms a part of the criteria for judging the quality of such works; hence, its significance.

Styles of Referencing

There is no doubt that several forms and styles of *referencing* are in existence; all taking their roots from the age-long and traditional form being the *footnote*. According to Adeniyi {2001}, the choice of a particular style is often published in recognised literature or texts; some of which include are: -

1. Campbell, W.E. & S.V. Ballon {1974}. Form and styles of writing Theses. Research Reports and Term papers.

2. Strunfied, W. & E.B. White {1962}. The Elements of Styles.

3. The Modern Language Association Styles {MLA}

4. Turabian, R.L. {1987}. A Manual for Writers of Term Papers, Theses and Dissertations.

5. The Publication Manual of American Psychological Association {APA}

Each of the sources listed above provides ample information regarding the *Styles of Referencing* as favoured by the authors or associations responsible for their creation. A general assessment of these formats reveals that a broad categorization into two main classes is possible. These classes are: -

1. The Traditional or Classic Format {i.e. *The Numbering or Footnote*}

2. The Author/Date Format {i.e. *The APA Styles*}.

The Traditional or Classic Format

This *referencing* format had survived from the early civilization and scholarship. Great authors and writings of the ancient, the medieval and renaissance have heavily employed the use of this format; a typical example of which is the *Footnote*. *Footnoting* is quite similar to the modern day *Numbering* format; since both employ the use of numbers, though in slightly differing ways.

Such classical writing as those of William Shakespeare and other literary giants of the early times used the avenue of the footnotes not for referencing purpose only but also for explaining the difficult aspects of such works as they relate to the individual pages of their works. This is because the citations are to be found at the bottom of the pages where they occur following the pattern of the numbers assigned them in the body of the work.

The primary advantage of their use is that of convenience since the reader finds those information contained in the footnotes readily available on the same page. Thus, the footnote serves as a ruing reference; hence its traditional or classical nature. This form of referencing has the distinctive nature of employing a great deal of Latin abbreviations such as: -

i. *Ibid {Ibidem}* to denote same place as a previously cited work.

ii. *Op. cit {Opere citato}* to denote that the citation is in the work cited; and it is quite similar to Ibid.

iii. *i.e. {id est}* to denote 'that is'
iv. *loc. cit {loco citato}* to denote 'the place cited'.

Apparently, this form of referencing employs the numbering styles whereby numbers assigned the citations the text correspond with the order in which, they appear under references.

The Author/Date Format

This contrasts with the one above as a modern format of referencing and the most widely adopted at present. Overtime, this format has been closely associated with the specification of the *America Psychological Association Style of Referencing*. Adeniyi {2001} states that this format takes its root in 1929 when it was published in *Psychological Bulletin* of the *American Psychological Association* to serve as a guide to authors in the preparation of their manuscripts.

This is the product of the Association's recommendation on the standard procedure to which reference might be made in case of doubt. Since 1929, when first published, several revisions of the work came out in 1944, 1952 and 1974; thereby gaining wider acceptance. Since then, every edition had aimed at aiding authors in the preparation of manuscripts. Abdulkareem {1980} attributed the wider acceptability enjoyed by this format today to its ***simplicity, clarity, conciseness, objectivity*** and ***ease of understanding***. It is not surprising therefore to find the format being used in virtually all areas of knowledge, especially with regards to all forms of technical report writing.

How To Cite Within the Body of the Work (In Context)

Using the *APA Styles of Referencing*, there are certain specifications, which seek to ensure standard and uniformity. First among these is the author/date order of citation. Here, the author's surname is provided while the publication date/year appear in parentheses, which follows immediately.

Issa {2007}, where the author's surname forms a part of the sentences or narrations, is a typical example.

But when the author's surname does not form a part of either of these, both the name and the year are contained in the parentheses, separated with a comma.

E.g. **{Issa, 2007}**

In this case, both do not form a part of the sentences or narrative; as they come normally at the end of it.

Rules Guiding the Use of Quotation Marks

In using others' works, it may involve paraphrasing or summarising the ideas or opinions expressed therein in one's own words. It is also common to find writers quoting directly (verbatim/word for word) from the source (s); Here also, there are rules guiding the use of any of these. For instance, direct quotations which contained statements that are more than 50 words, or more than three typewritten lines must indented. This requires no use of the quotation marks; as in the example below: -

Example 1

In his contribution on the nature of reference materials, Kolawole {2003} remarks: -

> *General reference materials are broad in scope and contain a variety of information oftentimes unrelated. The topics are only related by a common mode of arrangement. Reference materials cannot be borrowed for use out of the library except by some special arrangement. Reference books have been planned and written to be consulted for items of information, rather than to be read from cover to cover.*

Whenever this type of direct long quotations are made, it is important to note that typing is done in single line spacing while the margins on both sides are clearly shown. Note also that the *citation* i.e. *Kolawole {2003}* in the example above, may follow immediately after the quotation whereby, both the name and date would appear in parenthesis (*Kolawole, 2003}.*

However, quotations containing fewer than 50 words or lesser than 3 typewritten lines need not be indented since such quotations would run along in the body of the work. A way to distinguish such quotations, especially when they are of the direct form, is by the use of *Quotation Marks* ("...*"*). Where quotes appear within quotations, single quotation marks ('…') are used to set out one from the other, as illustrated below: -

Example 1

In his discussion on the types of research, Aina {2001} states: *"there are two main types of research. These are 'basic' or 'pure' as well as 'applied' research".*

Rules Guiding the Use of Ellipsis/Dots

Another important element of this form of *citation* is the use of *three dots/ellipsis points* {…} which may come either at the beginning, in the middle or at the end of the quotation; each having its own significance. This is illustrated in the examples below: -

Examples

i. If the dots appear at the beginning of the statement, this means other statement(s) had preceded the portion being quoted with the quotation mark extending out to its beginning. E.g. "… *and affirmed that is it good to be good*".

ii. If the dots appear at the middle of the statement, it means other statements, not considered to be of relevance to the issue at hand, have been omitted. This is usually done at the discretion of the author and it may come up at any point within the quoted sentence (s). E.g. "*Considering the ever-dwindling state of our economy, high rate of unemployment, illiteracy level…, one cannot but conclude that the nation is presently in a sorry state*".

iii. If at the end, it means that there are other statements in the quotation, which the writer did not deem fit to be included in his work for reason(s) best known to him. E.g. "*Considering the ever-dwindling state of our economy high rate of unemployment and illiteracy level, one cannot but conclude that the nation is presently in a sorry state…*".

Note that only three dots are used for these purposes and not more or less; as anything outside of this will be against the rule.

Citing Inaccurate Quotations

When using direct quotations, accuracy of quotes must be ensured; to the extent that words misused or mis-spelt must appear as contained in the source(s) being quoted. To show that you have taken note of the mistake, and prevent confusion on the part of the reader, the Latin word '*sic*' is

written in a bracket and then underlined right in front of the mis-spelt or misused word. Thus, the {***sic***} sign is used to indicate that you are aware of the mistake contained in the quotations thereby drawing readers' attention to it.

Example 1
Arising from the findings of a study, Lawal {2003} concludes, "All stakeholders' hands must be on deck to solve the problem ones {sic} and for all".

Example 2
One cannot but be surprised to hear constructions such as: -

i. *"Since the day I am {sic} born".*

ii. *"I prefer yam than {sic} rice",*

coming from students in tertiary institutions today.

Citing Works of Two Authors
If a citation is the product of two authors, both surnames should appear with the date; following the usual patterns such as indicated in the following example: -

Kolawole and Issa {2003}
Or
{Kolawole and Issa, 2003}

depending on the location of citation in the text.

Citing Works of Six Authors
Where the authors are more than two, but not more than six, all of them must be cited as at when and where they first appeared in the text while subsequent citations take cognisance of only the first named author followed by *et. al,* before the date.

Examples

i. When cited for the first time, it takes this form: -

Olaoye, Kolawole, Issa and Ango, {2003}
Or
{Olaoye, Kolawole, Issa and Ango, 2003}

ii. When cited subsequently, it takes this form: -

Olaoye et. al. {2003}
Or
{Olaoye et. al., 2003}

Citing Works of Corporate Authorship

The same rule applies in corporate authorships, involving organizations, government and non-governmental agencies, corporations associations, and other unions. This is particularly so for such corporate authorships whose names are too length. In this case, the names would be fully written only at the first instance in the body of the text and then abbreviated in subsequent instances. If they are not too long, however, they may be repeated in their full forms.

Example 1

i. When first cited: -

United Nations Educational, Scientific and Cultural Organization (2000)

ii. When subsequently cited: -

UNESCO {2000}
Or
{UNESCO, 2000}.

Example 11

i. When first cited: -

National Council on Privatisation and Commerce (2003)

ii. When subsequently cited: -

NCPC {2003}
Or
{NCPC, 2003}

Example 111

i. When first cited: -

National Agricultural Production Research Institute {2002}

ii. When subsequently cited: -

NAPRI {2002}
Or
{NAPRI, 2002}

Citing Several Works of an Author

When citing several works of an author, which have been used in the present work, the dates/years of publication are the main distinguishing factors. Regardless of how they had occurred in the body of the work, they are distinguished in the portion under *References* by their years of publication, which should be in chronological order as in the examples below: -

Example

Salman, A.A. {1986}
Salman, A.A. {2000}
Salman, A.A. {2003}

The chronological arrangement as shown above is the determining factor when writing out the *Reference;* regardless of how they occurred in the body of the work. This is similar to the arrangement of such works in the way they were cited in the text, as is in this example: -

Example

{Salman, 1986,2000,2003}
Or
Salman {1986,2000,2003}

An important point to note here is that such works, though written by the same author, are of differing contents. They are only considered together in view of a common idea that might have run through them; which is the reason for *citing* them.

Citing Works Published in the Same Year

Similar to the above is a situation whereby two or more works are published in the same year either by the same or more authors. The guarding rule is that such works be arranged in the order of alphabets *a, b, c, d* etc., to be written in front of the years of publication.

Example 1

Olanrewaju {2002a, 2002b, 2002c, 2002d}
Or
{Olanrewaju, 2002a, 2002b, 2002c, 2002d}

Example 2

Ifabiyi and Olanipekun {1999a, 1999b, 1999c, 1999d}
Or
{Ifabiyi and Olanipekun, 1999a, 1999b, 1999c, 1999d}

Citing Anonymous Sources

If the work has no author; as in the case of some newspaper/magazine writings and other classical, anonymous writings, the title becomes the issue in focus (*Access Point*).

Example 1

*In one of its editorial columns, the **Tribute** {2004} made a passionate appeal to the Federal Government to reconsider its current embargo on employment.*

Example 11

*In one of its recent issues **Tell** {2004} took a critical look at the current spate of insecurity across the land.*

Citing Internet Sources

As for citing sources from the *Internet*, it does not differ significantly from the others, especially when the authors name is provided. Where this does not exist, however, {as is the case some times}, the site address from where the information was provided becomes the reference point.

Example 1

In his own contribution to the discourse on what the essential components of information are, Sukovieff (2004) states that "…"

REFERENCES

Abdulkareem, A. Y. (1980) "Selecting a Research Topic". In Jimoh, S. A. Research Methodology in Education: An Interdisciplinary Approach. Ilorin: University of Ilorin Library and Publication Committee. Pp. 87-92.

Adeniyi, J.A. {2001} "Citation and Referencing". In Adegboye A.O. {ed} Research Project Report: A Practical Guide. Ilorin: Kola Success Project. Pp. 103-123.

CHAPTER SEVEN

HOW TO REFERENCE WORKS ALREADY CITED IN THE BODY OF THE WORK

Introduction

What was done in the last chapter was to explain the various methods of *citation* in the body of the work. The other side of this is the way the *references* are made at the end of the work. It is important to note that the *citations* in context must correspond with the *reference* list. Often times, *references* are listed; some of which are not traced in the body of the work. When this happens, either of two things is possible.

The first possibility is that the author has read so wide in his area of interest and intends to draw attention to some relevant works he had consulted but not used directly in his work. In this case, the appropriate thing to do is to have another separate heading after the *References* to be titled *Bibliography*. In the alternative, the items may be filed together and titled as *References* and *Bibliography*.

The second possibility is undesirable; as it is not only unethical but also dubious. This is a situation where the writer fails outrightly to indicate the sources of materials used in the body of the work as expected; only for a list of items to appear latter under *references* at the end of the work. When this happens, the first impression that one gets is that the author lacks an understanding of what *references* are and their significance in standard writings.

Other wise, he would have known that it is simply fraudulent to use others' works/ideas only to make it look as if they are his. At any rate, this practice exposes the intellectual bankruptcy of the individual writer who engages in such a practice. Sad enough, this is prevalent among lecturers who turn lecture notes into conference papers in such a great hurry that they miss out on the objectives of such writings. The practice is, to say the least, quite unwholesome as it is condemnable.

Also significant to mention at this juncture, is that little difference exists between the *referencing* methods commonly used for textbooks and those of other technical writings as projects, theses, dissertation, conference, seminar papers etc. The reasons for this slight difference are two namely: - that there are no generally accepted specifications for *referencing* books, as there are for other technical writings. Book authors are therefore at liberty to adopt any method of their choice. Secondly, is the fact that many authors have been found using the numbering style of the traditional or classical

referencing format. This has no rigid stipulations regarding certain basic elements that *References* must contain.

On the other hand the author/date method, which is the hallmark of the APA Style has become uniform, clear, consistent and widely adopted in the academic world generally. Its popularity among intellectuals the world over is simply unequalled. This may be partly due to its academic origin (American Psychological Association} and perhaps, due to its currency as a result of its constant updating through regular revisions.

Today, there is the latest specification on the *APA Referencing Style*. Although this so-called new APA style contains only a slight variation from what used to be obtained, it remains a remarkable effort in its principle of constant updating for currency. This, in itself, is commendable; and probably explains, in part, the much of a wider acceptability that the style presently enjoys. On this strength, therefore, the new APA style shall be used as our guide in discussing how to reference works, which have been already cited the body of the text.

The New APA Style of Referencing

The works cited in the body of the text usually come from a variety of information formats, such as books, journals, magazines, newspapers and in recent time, the Internet. For each of these formats, there are set guidelines to be followed. The essential elements of this new style can be broadly categorized into four (4) namely: -

(a) The Author Component
(b) The Date Component
(c) The Title Component
(d) The Important Component

The Author Component

The author's surname, separated by a comma, together with the fullest of the remaining names or the initials, as the case may be, are hereby given. Titles like **Dr. Mrs. Prof. Alh. Rev**. etc. are totally disregarded. The first letter of the surname should be capitalized. All the authors' names, regardless of their number, must be provided here and ensuring that a full stop (.) comes after each of the initials, except where the full names have been provided.

Example 1

Olaoye, J.O.

Example 2

Arinola, S.A.

The Date Component

Immediately following the author's name is the year of publication, generally referred to as *date*. It is the year in which the work was produced or published. Usually, they are enclosed in parentheses in front of the author names.

Example

Olaoye J .O. (2002)

In some rare situations, there are works without publication dates. Where this is the case, the letters *n .d*., (*no date)*, are given in parentheses instead.

Example

Aliyu, M.B. (n. d).

The Title Component

The fullest form of the title of the work being *referenced* is hereby given; providing both the main and sub titles, wherever applicable. In *referencing* titles of works, slight variations exist, which serve to distinguish between textbook titles, book chapters from those of journal articles and newspaper/magazine reports.

Textbook titles are set out in a way that the first letters of both the title and the subtitle as well as those of other proper names (if there are) are capitalized. The general rule, which applies here, is that all book titles, once written as explained above, are underlined. However, some textbook *referencing* had their book titles written in italics in substitution for this common practice. If the work has an edition other than the first, then the edition statement is provided immediately after the title.

Example

Madu, E .C. (2004) Technology for Information Management and Services. (2nd ed.).

For a work, which is a chapter of an edited work, the author's name and initials come first, followed by the date and then the title. After these, the word *In* is used to introduce the editor's identity as well as the title of the edited work. Unlike the author's name, which will be inverted, the editor's name is not but will be followed by the word (*Ed*.) or (*Eds.)* as the case may be, in parentheses.

Example

Olorunyomi, G.F. {2003} "The Nature and Use of Serials". *In* A. A. Kolawole & A.O. Issa {*Eds.*} *Library and Information Science: An Introductory Text.*

Some important things to note in the example above include: -

i. That the author of the book chapter in question comes up first and is inverted.
ii. That the title of the book chapter comes next after the date (in parentheses). This title of the book chapter is in quotation marks/ inverted commas.
iii. There is a full stop (.) immediately after the chapter title
iv. The word "*In*" introduces the editor, whose name is not inverted. It is however followed by the letters (*Eds*.) in parenthesis.
v. The title of the edited book is underlined.

The Imprint Component

The term *imprint* refers to bibliographic information such as the place and year of publication as well as the name of the publisher in respect of a particular book or even non-book material. The *imprint* component of the *reference* therefore refers to this group of information, which also include the pagination. The following is the order of their presentation: -

Place of Publication

This comes immediately after the title, where there is no *edition statement.* Where there is, then, the *edition statement* precedes it. Usually, the first listed name is chosen except where there is another, which is more recognized than it.

Examples

2nd ed. Lagos:
3rd ed. Kaduna:
4th ed. Ilorin:

Name of Publisher

This follows the *place of publication* with the colon sign (:) in between them.

Examples

2nd ed. Lagos: University of Lagos Press.
3rd ed. Kaduna: Northern Publishing Co.
4th ed. Ilorin: Wunmi Commercial Press.

Page Location

This comes last to indicate the exact location of the information cited. Where it points to specifics, only a particular page number, which contained that information, is indicated.

Example

P. 13.

Note that the letter 'p' is capitalized and followed by a full stop (.) to show that it is an abbreviation, while the number in itself is written in figure and not in words. If the cited work covers a number of pages, as it is usually the case with journal articles, two letters 'p' would be used. In this case, the first appears in capital and the second in small case followed by a full stop (.)

Example
Pp. 14-24.

Examples of References

In the end, a full citation is provided for the work in our example as follows: -

Edited Work

Olorunyomi, G.F. {2003}"The Nature and Use of Serials". In A.A. Kolawole & A.O.Issa {Eds.} Library and Information Science: An Introductory Text. 2nd ed. Lagos: University of Lagos Press. Pp. 42-59

Unedited Work

Aliyu, M.B. {2002} A Beginner's Text on Librarianship. Offa: Wunmi Commercial Press. P.8.

Joint Authorship

Olanipekun, S.A & O.J. Ifabiyi {2003} Library and Information Science: An Introductory Text. Offa Dee Root. P. 10.

Seminar/Conference Paper

AbdulKadir, O. L. (2004) "Social Mobilization through the Broadcast Media for National Integration and Development". A paper presented at the 1st National Conference of the School of General Studies held at the Federal Polytechnic, Offa. 23rd–25th March. P. 4.

Journal Paper

Oyinloye, A .M. (1998) The Internet: Challenges for Academic Libraries in Nigeria. Focus on International and Comparative Librarianship. 29 (3). Pp. 146-151.

Newspaper \ Magazine (With Author)

Jibade, O.M. (1996) "Presidential Primaries: The Rigging Game". Tell, 34. August 24. P.11-13

Without Author

"Presidential Primaries: The Rigging Game": Tell, 34. Aug. 24. P. 11-13.

Internet Resource

Sukovieff, H. M. (2004) An Investigation of Influences on Career Decisions of High School Graduates: A Follow-Up Study. *SSTA Research Centre Report*. Retrieved Apr.10, 2005 from http://www.ssta.sk.ca/students/90-04.htm

CHAPTER EIGHT

GUIDELINES FOR PREPARING THE FINAL COPY OF THE PROJECT

Introduction

It is assumed in this chapter that the required five (5) chapters of the project had been well written by the student and thoroughly supervised by the supervisor. The successful writing of the five chapters did not, however, make up the entire project work. Equally important are the preliminaries, which precede the main body of the project. These are commonly referred to as the *Preliminary Pages*. So, the remaining part of this chapter was devoted to setting up these pages.

The Preliminary Pages

The preliminary pages consist of the following: -

The Full Title Page
The Approval or Certification Page
The Dedication Page
The Acknowledgement Page
Abstract Page
Table of Content Page

The Full Title Page

This is the page on which the following information are usually found: -

a. The main title of the work and the subtitle {if any}.
b. The complete names of the student {s} as the case may be.
c. A follow-up statement describing the research project, the department to which it is being submitted and the purpose of the submission.
d. The name of the institution to which it is being submitted.
e. The month and year of publication

The Approval or Certification Page

As its name implies, *Approval/Certification Page* expresses statements confirming the fact that the work had been properly supervised and approved; having met the standard requirements of the department and

of courser, the institution. Below these statements are the following provisions namely: -

a. A space for the supervisor's name and a corresponding space for the date.
b. A space for the head of department's name and a corresponding space for the date.
c. A space for the student's name and a corresponding space for the date.

The Dedication Page

The student researcher writes his/her dedication on this page. Usually, this comes in a few lines of sentences to form a single paragraph. If one must go strictly by the dictionary understanding of the word 'dedicate', which means "to set apart for a holy purpose", the dedication page was to be devoted mainly to God, the Almighty. Thus, the page is supposed to be "solemn" in its contents and be God-focussed. So, the practice has been to begin this page with the expression of one's indebtedness to God, first and foremost.

The Acknowledgement Page

Usually, this is lengthier than the dedication as it allows for all forms of comments regarding the roles played by every significant contributor to the successful completion of the project work. Although the *Dedication Page* is supposed to be the "holy page", as it were, where God is focussed, it remains logical that the *Acknowledgement Page* also begins on the note of the praiseworthiness of God Almighty.

The researcher's parents (whether dead or alive), relations, supervisor, colleagues and friends as well as the typist, should all have a place in the *acknowledgement*. This is to the extent that all these have contributed in one way or the other to the successful completion of the project. There is no limit to the number of pages that this must contain even though an average of one to two pages is hereby recommended so that it can retain its focus.

Abstract Page

This is also an important aspect of the *preliminaries.* It is at providing a summary of the entire project work. This is from the perspective of its dictionary meaning implying "a shortened form of a statement, speech etc." {Quirk, 1978}. This definition only gives a basic understanding of what

abstract is, from a general perspective, which will not serve the required purpose for writing an *abstract* in a project work or even conference.

Forms of Abstract Writing

Abstract Writing in Projects/Theses/Dissertations

In a more professional sense, the term *abstract* connotes a short account of something much longer such that only the salient issues contained are brought to the fore. It is a sort of synopsis. Unlike the summary, the synopsis aims at certain specifics, which in the case of project/thesis/dissertation writing will include the following briefs namely: -

i. The problem statement
ii. The study's main objective
iii. The main justification for the conduct of the study
iv. The research methodology; highlighting the population, sample, sampling technique, data collection instruments and their administration as well as the data analysis methods and procedures
v. The study's main findings.
vi. The conclusion(s) drawn from the study's main findings.
vii. The highlight of the recommendations made.

Abstract Writing in Conferences, Seminars and Journal Paper

This differs from those of projects, theses and dissertations in a number of ways, some of which are as follows: -

i. It is much shorter in length, usually of about 50 words.
ii. It has no paragraphs since only one paragraph is required.
iii. It should provide an over-view of the work's contents by compressing the *problem statement* and/or *study objectives*; the main thrust of the work; its main findings, conclusion(s) and recommendations into the paragraph.
iv. It must be on a separate page.
v. The paper's title and/or the author's name must not be repeated on this page or elsewhere in the work.
vi. The abstract should be written in single line spacing while the word "*ABSTRACT*" should be aligned to the centre on this page.
vii. Quotations are not entertained in this segment.

The followings are examples of the two categories of abstract writing: -

Example 1 (Project, Thesis and Dissertation)

Below is a sample Abstract of a project titled: -

THE EFFECTS OF USER EDUCATION ON LIBRARY USE AT THE YABA COLLEGE OF TECHNOLOGY LIBRARY

This research work sets out to investigate User Education and its Effects on Library Use at the Yaba College of Technology Library. It has been observed that the major problem confronting academic libraries is the ability of the students to make effective use of the library. This is usually associated with academic performance of the students in these institutions, which negates the aims and objectives for which the academic libraries, were set up in the first place. This justifies the imperativeness for conducting a research on the effects of user education on library use at the Yaba College of Technology Library. In order to conduct the study therefore, a survey research design was adopted; using questionnaire and interview as the major instruments for collection exercise and was completed by personal observation. Tables and percentage were used for data presentation thereby enabling for easy discussion and interpretation of data.

At the end of the data gathering exercise, the study revealed that although user education exists at the College Library, user experience certain difficulties. Some of these include inability to use the subject catalogue to locate materials on the shelves and ignorance as to where to go during visits to the library which is on account of the fact that some students and lecturers do not handle the use of library course seriously by having the mentality that it is not a departmental course, teaching the course without practical, using difficult approach to teach the course and not given proper information about the course.

Thus, the study concluded that unserious ness in handling the use of library course by some of the Students and Lecturers could go a long way in hampering effective User Education programme provision necessary for assisting the users in making effective use of the library.

Finally, appropriate recommendations are put forward for solving the present situations as revealed by the study. Some of these include students' adopting a changed attitude towards the course, thereby, taking the course on library use more seriously, lecturers teaching the course with practical demonstrations, making the approach simple and ensuring the provision of information on the course.

Table of Content Page

These are the last of the preliminary pages and usually run into more pages than one. The *content pages* are set out in such a way that to its left hand side, the contents are outlined beginning with the preliminary pages themselves running through the entire chapters. Corresponding to each of the content item listed will be the page numbers beginning with the roman numerals of the preliminary pages through to the Arabic numbers of the main pages of the five chapters. Also, each of the main and sub-headings carry some designated numbers corresponding to the chapter number to the inner left-hand margin.

To illustrate a typical format of the preliminary pages discussed in the preceding pages of this chapter, an hypothetical sample will be provided in the following pages: -

THE EFFECTS OF USER EDUCATION ON LIBRARY USE AT THE YABA COLLEGE OF TECHNOLOGY LIBRARY

BY

OKOOBOH ONOJASIKE ELIZABETH
LI/HND/FO4/014

SUBMITTED TO THE DEPARTMENT OF LIBRARY AND INFORMATION SCIENCE,
SCHOOL OF COMMUNICATION AND INFORMATION TECHNOLOGY, FEDERAL POLYTECHNIC,
OFFA, KWARA STATE

IN PARTIAL FULFILMENT FOR THE AWARD OF HIGHER NATIONAL DIPLOMA (HND) IN LIBRARY AND INFORMATION SCIENCE

DECEMBER, 2006.

APPROVAL PAGE

This project work has been read and approved as meeting the requirement of the Department of Library and Information Science, Federal Polytechnic Offa, in partial fulfillment of the requirement for the award of Higher National Diploma (HND) in Library and Information Science.

…… ……..

Dr. A.O. Issa **Date**
(Project Supervisor)

……. ……

O.E. Okooboh **Date**
(Researcher)

…… ……

J. O. Olaoye **Date**
(HOD)

DEDICATION

This research project is dedicated to Almighty God who moulded me right from my mother's womb and by whose divine assistance made it easy for me to accomplish this work.

ACKNOWLEDGEMENT

I am most grateful to the Almighty God for the successful completion of my Higher National Diploma Programme and also for His provision, protection and guidance over me and every member of my family.

My profound thanks go to my project supervisor, Dr. A.O. Issa whose assistance, guidance and criticism made this work a success. My sincere thanks go to my parent Mr. and Mrs. J.E. Okooboh for their encouragement, care guardian and financial support right from my childhood up to this very moment of my life. No amount of expression can describe enough their wonderful support and care shown to me. Also deserving my appreciation are my brothers and sisters, Iziegbe, Omonoh, Eliabhi, Itua and the entire member of my family.

The place and role played by Engineer Chukwuma Osemeke deserve a special mention here. He was involved in the process of gathering information for this research work. He is also the one who provided all the copies of questionnaires that was used to collect data for this research. I am grateful to him for this.

I would like to specially thank Mrs. S. A. Ukaigwe, Mrs. R. N. Iyiegbuniwe and the entire staff of the University of Lagos Library for the assistance and support provided in the course of collecting relevant data for the purpose of this research. I would also like to thank the entire staff of the Yaba College of Technology Library especially Miss. Gloria Elonye, the Circulation Librarian who assisted me in administering the questionnaire used for the collection of data for this research.

Not least deserving my gratitude are my friends, Mr. Donald, Mr. Daniel Jeremiah, Barister Mayowa, Engineer Patrick Ekuozor, Kola Ayoola, Anthony Alagbile, Ifeoma Nwobodo, Cynthia Samuel, Lawal Adenike, Ademola Bunmi, Bakare Tayo, Leo Omolakin and the entire member of the Nigeria Federation of Catholic Students. I will not also forget the entire members of the 2005/2006 sessions, Library and Information Science Department.

TABLE OF CONTENTS

ABSTRACT

This research work investigates User Education and its Effects on Library Use at the Yaba College of Technology Library. It has been observed that the major problem confronting academic libraries is the ability of the students to make effective use of the library. This is usually associated with academic performance of the students in these institutions, which negates the aims and objectives for which the academic libraries, were set up in the first place. This justifies the imperativeness for conducting a research on the effects of user education on library use at the Yaba College of Technology Library. In order to conduct the study therefore, a survey research design was adopted; using questionnaire and interview as the major instruments for collection exercise and was completed by personal observation. Tables and percentage were used for data presentation thereby enabling for easy discussion and interpretation of data.

At the end of the data gathering exercise, the study revealed that although user education exists at the College Library, user experience certain difficulties. Some of these include inability to use the subject catalogue to locate materials on the shelves and ignorance as to where to go during visits to the library which is on account of the fact that some students and lecturers do not handle the use of library course seriously by having the mentality that it is not a departmental course, teaching the course without practical, using difficult approach to teach the course and not given proper information about the course.

Thus, the study concluded that unserious ness in handling the use of library course by some of the Students and Lecturers could go a long way in hampering effective User Education programme provision necessary for assisting the users in making effective use of the library.

Finally, appropriate recommendations are put forward for solving the present situations as revealed by the study. Some of these include students' adopting a changed attitude towards the course, thereby, taking the course on library use more seriously, lecturers teaching the course with practical demonstrations, making the approach simple and ensuring the provision of information on the course.

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ABOUT THE BOOK… This book serves as a practical manual for students in institutions of higher learning with particular reference to their project writing requirements. The simplistic approach in treating fundamental concepts and issues involved in a typical project writing exercise, as adopted in the book, recommends it for not only students at different levels of higher educational pursuits, but also their supervising lecturers and indeed, the generality of knowledge seekers, especially in the area of research.

ABOUT THE AUTHOR… Abdulwahab Olanrewaju Issa is a Principal Lecturer in the Department of Library and Information Science, the Federal Polytechnic, Offa, Kwara State. He holds DLSc. (1987); BLSc. (1991) and MLSc. (1996) from the Ahmadu Bello University, Zaria, where he worked as Graduate Assistant and Assistant Lecturer respectively between 1992 and 1999.

While in the university, opportunities and privileges, which came up, especially in the research related areas were maximally utilized as platforms for acquiring needed experience and expertise in this regard. Specifically, he served as Departmental Secretary, and also Secretary, Departmental Post-Graduate Defence Committee, both under the tutelage of a Professor. The acquired exposure and experience have since been widely deployed in varying circumstances of needs; particularly in offering services to individuals and groups as a Research Consultant. He had been an assessor to several academic journals since his university days.

Currently, he is editor to two academic/professional journals in his institution. He is being widely consulted in matters relating to academic theses and other technical paper writings and had been called to chair several conferences and seminars in the academic and professional circles of recent.

He was Head of Department (2000-2004), Director, Centre for Continuing Education (2004-date) at the Federal Polytechnic, Offa, and Vice Chairman, Nigeria Library Association, Kwara State Chapter (2003-2005). Currently, Dr. Abdulwahab Olanrewaju Issa holds a Ph.D. degree from the University of Ibadan.