PRACTICAL STEPS IN RESEARCH

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AKNOWLEDGEMENTS

PREFACE

The production of this book was informed by the need to simplify and highlights some critical steps in research such that emerging educational and to some extent social researchers can hit the ground running in the pursuit of making research worth its while and an enjoyable enterprise. The book thus gives overview of the critical steps in educational researching and highlighted how to effectively do the background to a research, properly articulate the problem of a research. It also teaches the basic principles of literature review, research methodology – design, population and sample.

Furthermore, topics such developing quantitative research instrument, qualitative instruments, collecting data, analyzing both qualitative and quantitative data, interpreting results, discussing the results and writing research report were well treated in the book. Also, proposal writing for finding and referencing in a research process were equally given attention. It is hoped that this book which is a product of a research training conducted by the Institute of Education, University of Ibadan, Nigeria for an organization in November, 2013 will be of immense assistance to both higher degree students in educational research and other similar research processes and to practitioners as well. We, therefore, commend the book to all and sundry.

The editors
November, 2013

CHAPTER TWO

DOING BACKGROUND AND LITERATURE REVIEW

Chapter Objectives

After going through this section, The reader will be able to:

- ❖ Plan for the research activity.
- ❖ Generate topics for research,
- ❖ Identify variables of concern in the topic selected
- ❖ Identify areas to do the background reading on
- ❖ Determine the Purpose of the research
- ❖ State the Problem of the Research topic
- ❖ Identify the aims/objectives of the research
- ❖ Identify the Delimitation/scope, and
- ❖ Decide which to use – Research Questions or Hypotheses

Introduction

The essence of this section (writing background and literature) is to expose readers or writers/ researchers/presenters on identifiable components which every paper to be presented should highlight and how the presenter should articulate each of the components while developing such paper. The expectation therefore demands that the researcher should ensure that he/she reflects on issues which concern.

1.   Planning for the research
2.   Identify a Problem/Topic - **"*The what Issue*"**
3.   Doing the background

    a.   Determining the Purpose or Stating the Problem - *" The why issue"*
    b.   Researching your topic
        i.   Literature Review or Background Reading – what is known
        ii.   what is unknown - Identifying gaps

    c.   Aims/objectives - what do I aim to discover?
    d.   Identify the Delimitation/scope,
    e.   Decide which to use - Questions or Hypotheses or both

4.   Determine the methodology - how am I going to discover it?
   a.   Design
   b.   Population
   c.   sample and sampling procedure
   d.   instruments,
   e.   data collection procedure
   f.   data analysis,

1.   Results - what have I found?
2.   Discussion of findings - what does it mean? and
a.   Conclusion - so what?
b.   Recommendation
c.   References
3.   Suggestions for further research - what next?

For this presentation however, I am going to focus on the first three sections, while my colleagues will look into sections four and five.

1.   Planning your Research

A plan is a method of deciding in detail how the researcher wants to carry out the activities and how he/she intends to achieve it before embarking on the research. It also entails deciding what the main parts of your research will be and draw a sequence of how it should be attained. A researcher, who draws up a detailed plan of what he/she is going to do, reduces the chances of encountering problems during the research endeavour. Issues concerning each component of the research (the what, why, how, when each activity will be carried out), must be well reflected on before embarking on the study. Doing this activity will enable the researcher identify areas of probable hitches or bobby traps and gets them nipped in the bud before the research begins.

2.   Generating Research Topics – "The What Issue"

This is one of the difficult aspects of research especially for beginners. Research topics sometimes are set well in advance. Examples include; presentations made at conferences where participants are given specific themes or sub-theme to work on. However, one may be permitted to choose a topic in any area that interests the presenter or a topic on any contemporary issues in the presenter's area of speciality. The presenter should ensure that he/she understands the issues which the topic addresses. The presenter should show signs of having a good understanding of what the topic entails (isolating the meaning, identify the prominent constructs or variable's embedded in the topic). He/she should be

conversant with how to present the study in an argumentative manner, explain or discuss every element of the work. Issues concerning the objective as well as significance of conducting such study should be properly articulated.

Research topics can be generated from the following sources:
i.   Review of related works conducted in that particular area of interest. According to Okpala (2005), to select a good topic, one should be conversant with the problem areas in his discipline.
ii.   One can also achieve this through extensive consultation of works carried out in that area with particular interest in their limitations, methodology as well as suggestions for further studies sections of the works consulted.
iii.   However, it also possible for researchers or presenters to generate researchable topics through personal observations of naturally occurring phenomena around the researchers environment (work and home environment).

In selecting a topic, all efforts should be made to ensure that it;
i.   Falls within the presenter's discipline in time and space
ii.   Is not a duplication of an existing work
iii.   Conveys some reasonable information on the variables and how they are matched in the study, etc
iv.   Is not too lengthy (e.g. some journal editors, universities do not allow topics or titles that are more than 24 words); and
v.   Is not vague (i.e. subject to numerous interpretations (Okpala, 2005).

3.   Doing Background Reading (Literature Review Principles)

Doing background reading entails doing a literature search in the presenter's identified problem area. It should involve analsing the topic critically and isolating the variables of concern. For instance, a research topic such as *"Home and school factors as determinants of literacy skills development among pre-school children in Nigeria (Odinko, 2002)"* will require the researcher to identify the home factors of interest. To one researcher such factors may include:
i.   parents' level of education,
ii.   parents' occupation,
iii.   socio-economic status of the family,
iv.   number of children in the home,
v.   material provision at home,
vi.   who the child lives with, among others .
While in the school factors she may decide to focus on such factors as

i.   teacher qualification,
ii.   type of school the child attends,
iii.   location of child's school,
iv.   class size, among others as well as
v.   indicators of literacy skills development (listening, speaking, reading and writing).

Whereas another researcher may decide to work on other factors entirely different from those listed.

Further another researcher may want to delve into this topic at a higher level of education thus changing the topic to read:

"Home and School Characteristics as Predictors of Senior Secondary Three Students' Achievement in English Language Studies".

Such a researcher may therefore decide to have the following as variables of interest.

Learner's Ability Level — Socio Economic Background
Learner's attitude towards schooling — Level of motivation
Economic status of the school — Influence of the society
Infrastructure provided by the school — Level of difficulty of the learning task
— Teacher quality
Validity & reliability of the achievement — Peer group Influence
Instrument.

Literature search in the topic chosen by the researcher should be based on the variables of concern. Care must be taken to ensure that the identified variables of interest are linked by showing relationships among dependent, moderating (if any) as well as independent variables. To achieve this, the researcher should make effective use of the library resources (textbooks, journals, periodical, etc. for research findings (empirical/theoretical) and the internet search, in order to ascertain which information is relevant to the study. The review process could be on relevant theories (perhaps to aid develop relevant theoretical framework) that may guide the study.

1.   Things to consider while doing review of related literature
It is generally expected that the researcher should consider the following while doing literature review of a study
a.   Relevance of the material to the identified variables of study.

b.	How recent the materials to be used are. (for instance, how empirically up to date are they?) Care must be taken by the researcher to adhere to the requirements of the organisation he/she is writing for.

c.	Does it have any link with the research variables, questions or the hypothesis?

d.	What gap is it trying to fill?

## 4.	Doing Background Writing on the Identified problem

Doing background writing on the identified problems could either be referred to *as "Background to the problem" or "Introduction to the study"*. Here the researcher tries to introduce the core research problem, *"sets the scene"* and outlines the path which the reader will travel through the paper. This view is illustrated in the following extracts from research works.

Extract 1 (Odinko, 2007)

"More specifically, emphasis will be laid on the use of instructional time, direction of interaction (who to whom), instructional approaches (teaching methods), classroom contexts (teaching the entire class all the time, use of small groups, and one to one basis), use of language during instruction and types of questions, responses and feedbacks given during instruction in Nigerian pre school settings. The study will also examine the state of such factors as class size, location, teacher/caregiver qualification, availability and use of teaching materials as well as the extent to which these factors relate to prevailing classroom interaction patterns common in Nigerian pre-school settings.

All these are discussed in nine distinct but related chapters. They comprise three literature review chapters, a methodology chapter, four result chapters and a chapter, which discusses the overall findings. The following two literature review chapters continue on issues relating to pre-school provisions in Nigeria (chapter 2) and quality pre-school provisions (chapter 3) in relation to identified pre-school quality indicators by individuals and by some educational organisations

Chapter two focuses on ECCE in the Nigerian context with an emphasis on how children at this age level grow up in traditional Nigerian communities (Hausa, Ibo, and Yoruba), influence of early childhood foreign theorists on preschool programmes practices in the country, Nigerian government's view on this level of education in terms of policy and practice as well as literature review on ECCE in order to find out if discrepancies existed between what the policy says and what is being practiced. Types of pre-school programmes available in Nigeria and the objectives of this level of education in the country are also discussed.

In chapter three, attention is focused on the views of educators, researchers, psychologists as well as organisational bodies on what quality pre-school programmes entail. This is

discussed under the identified quality indicators in the pre-school setting. To address this, a general picture of the state of pre-school programmes in Nigeria with regard to the itemized quality indicators is given. Thus, information on this is given under such distinct headings as; the state of pre-school programmes in Nigeria and what individuals, organisations as well researchers think pre-school quality should be. These are discussed under the following headings: pre-school learning environment, material provision and utilisation, teacher quality, medium of instruction, interaction patterns as well as class size. The research questions are also presented in this chapter.

The methodology of the study is presented in chapter four. It focuses on how the relevant data, used to provide answers to the research questions are gathered. A detailed description of the sample and sampling technique used, instruments for data collection, data analysis procedures as well as ethical issues on confidentiality, anonymity and informed consent are presented. The challenges which the methods used posed are also discussed.

The chapters giving the results are four (chapters 5, 6, 7, 8). Chapter five deals with the qualitative component of the data making sure that all the variables highlighted are in consonance with the ones used in chapter three. The quantitative results are presented in Chapters 6, 7, and 8 and these focused of the findings on research questions 2, 3, and 4 respectively. Finally, the last chapter of the thesis, provides a detailed discussion of all the findings as well as the policy implications, limitations of the study and the areas for further research are presented in Chapter 9.

The background showcases issues that concern what the presenter wants to do, why he wants to do them and the benefits that may accrue to such research endeavour. The researcher is expected to make a convincing argument here to inform or win the reader to his/her side on why he feels exercise is worth spending time, money and other resources on. To achieve this, the presenter is expected to bring into focus all the variables of concern in the study and show how they are linked with one another. The background should be articulated by the presenter so succinctly as to reveal the problem area he/she has identified without being emphatically stated. It should be discussed in such a way that experienced readers (in research technicalities) can state the research problem.

Background writing should be done in prose form. Opinions of experts that are in the area of investigation can be cited or quoted with proper reference included. However, the length is dependent on the requirements of the target audience, editorial board or guidelines of an institution. For instance, while some academic communities will insist on at least 8-10 pages before the problem statement other may argue that it too length. However, while the present struggles to establish the importance content area being discussed should not be included.

5. Stating the Research Problem - "*The why issue*".

A well-written statement of problem should indicate the variables of interest to the researcher and the specific relationship between those variables, which are to be investigated, including the type of subjects/respondents involved. Again, the style to be used while writing this section of research writing is a function of what the organisation you are writing for wants. For instance, years back in the University of Ibadan, students were expected to just state the problem preferably in a sentence or at most three. For instance, in a study titled "Effects of Pre-primary Education on the Cognitive and Affective Learning Outcomes among Primary School Children in Nigeria" the research problem is stated as follows:

Extract 2 from (Odinko and Iroegbu, 2005).
"Specifically, the study therefore sought to assess the effects of pre-primary education (treatment) on cognitive and effective learning outcomes of children at the beginning of primary level of education and whether such effects (if any) are sensitive to school location (urban/rural), gender of the children"

However, in recent times, statement of problem of this nature is not acceptable to the *University of Ibadan Postgraduate School. The students are expected to give a little background information of problem under study in a paragraph or two before finally stating the problem. This new recommendation illustrated thus;*
Title of the paper: *"Effects of Socio-Economic Status, School Types and Gender on Pupils Achievement in Core Subject Areas at the Junior Secondary School Level in Rivers State" (Extract 3 Odinko and Agi, 2012).*

"In Nigeria and perhaps Africa, it appears that academic performance in core subject areas (English Language, Mathematics, Integrated Science and Social Studies) under study may be a function of many factors. Despite the identified causes of academic failure adduced by researchers which ought to provide clues for solution, the problem of academic failure especially in public schools in Nigeria has persisted. The above situation of poor academic performance however, appears not to have gravely affected private primary schools which are widely believed to be doing better than public schools in Nigeria academically. This current trend would have been considered an anomaly because in the past the reverse used to be the case. Whether the prevailing better performance of private schools is significantly due to the content or process of their curriculum delivery or both is yet to be identified exhaustively. This gap is what this study sought to fill by looking at how school type, alongside gender, socio-economic status and school environment affect performance in selected core subject in Rivers State".

No matter the style the writer wants or adopts, he/she should use the following questions as guide:
a. Is the problem stated as early as possible? In a typical research article, it is ideal if the problem is stated within the background/introduction.

b. Is the problem workable? This is because, if the workability is very low, the study might not be implementable.

c. Has the problem attained a critical mass? Is it substantial (considering the time available for the study, what the study is to be used for, etc)? Can more problems be added, perhaps as sub problems? The size of the problem must be substantial to justify the study implementation.

d. Does the problem generate and sustain enough interest in the research? It is usually difficult to measure interest in a research initiated and conducted by an individual because such interest may border on personal values. This attribute may be granted if the research is completed. In the case of the community where the research is carried out, it becomes pertinent to consider the interest of the society which the research is meant to serve, funding agency, members of the group (if it's a group project).

e. Has the problem high theoretical value? To what extent has the researcher tied the problem to a theoretical base considering the relevant existing studies in the discipline?

f. What is the practical value of the problem? How does the practitioner/consumer/tax payers, etc, benefit from the provision of the solution to the problem? Is solution to the problem to be provided just as a mental exercise for the researcher or will it proffer solution to any basic societal need?

6. Determining the Purpose/Objective

The purpose or objectives of the study should be defined after the problem has been clearly stated. The purpose or objectives are the anticipated gains that will be derived after the researcher has conducted the study. This should specify the gap to be filled from the results of the research. It should state in concrete and concise terms the reasons for the study. For example, in the topic ' Psycho-Social factors as Predictors of Senior Secondary Two Students' Achievement in English Language'. The purpose of the study could be:

"To investigate the reasons for low achievement by Senior Secondary 2 students in English Language in examinations".

The objectives of the aforementioned study, which are also referred to as specific objectives, are components of the purpose. They must flow logically from the purpose. To formulate the objectives of the topic cited, the researcher will need to conceptualise the Psychological factors – student's attitude towards English Language, study habits, career aspiration, level of motivation, as well as social factors which may include peer group influence, economic status of the family, number of children in the home, among others.

From the specific elements or variables of both Psychological and sociological factors, the researcher formulates specific objectives such as:

To find out the relationship between (Psychological factors)

- ❖ the student's attitude towards English Language and students' achievement;
- ❖ study habits and students' achievement;
- ❖ level of motivation and students' achievement;
- ❖ career aspiration and student's achievement.

To find out the relationship between (Sociological factors)
- ❖ peer group influence and students' achievement;
- ❖ economic status of the family and students' achievement;
- ❖ number of children in the home and students' achievement.

While stating the objectives, the researcher must ensure that they;
- ❖ are rooted in the problem statement
- ❖ match with the factors or variables under study.
- ❖ measure the variables against the dependent variable.
- ❖ consistent with what the researcher wants to measure.
  are testable.
- ❖ are stated in a form that reflects the design of the study.
- ❖ are arranged in a coherent way

7. Decide which to use – Research Questions or Hypotheses.
Research questions and hypothesis are two alternatives (in most cases) and it is best to use one at a time except in situations where it is necessary to combine them. But to avoid duplication of issues, it is better not to use both.

a. Research Questions
This is usually situated towards the end of the introduction section of the research work. Research question should be logically and coherently stated and must be:

i.   related to your research problem, purpose and objectives,
ii. linked to your variables of concern, and
iii. clearly stated not ambiguous (subject to any interpretations).

However, in some organisations, editors suggest that, research questions should be written at the end of the literature review section. Schloss and Smith (1999) argue that a research question asks about the relationship between two or more variables. This view is illustrated in the following extracts from research work.

Extract 4 (Odinko and Adeyemo, 1999)

The present study sought to find out the extent to which some socio-psychological variables (home language, locus of control, study habit, career aspiration, interest in schooling, self concept, and test anxiety) provide an explanation for the poor state of learning outcomes in English language among senior secondary school students in Nigeria. Specifically, the study sought to provide answers to the following questions:

i.   *To what extent would the seven socio-psychological variables together predict senior secondary school students' achievement in English language?*
ii. *What is the relative contribution of the variables to the prediction?*

In another instance, if a researcher is testing a new teaching method, such as "personalised teaching method" he/she can ask, "will students exposed to personalised teaching perform better than those taught with lecture method in primary school mathematics?"

A question such as this appears too big to handle as a whole because there may be other elements inherent in the respondents that can also influence achievement. It thus becomes important for the researcher to identify such factors. Thus, the research question cited earlier can be structured in this manner;

i.   Which of the two teaching methods is more effective in bringing about more achievement at primary level?
ii. How does the gender of a learner influence his/her achievement?
iii. How does age of the learner influence his/her achievement?

Amin (2005) warns that one should avoid too many questions lest questions may be likened to a questionnaire. He suggested that one should use about four to six questions. However, he reiterates that the nature of the research problem tends to dictate the number of research questions to use.

b.   Hypotheses

A hypothesis is defined as a reasonable guess based on available evidence that the researcher intends to check. In essence, hypotheses are tentative truth or answers to a problem subject to verification. They are not absolute truths and not all researches need hypotheses. According to Best and Khan (1993), a research or scientific hypothesis is a formal affirmative statement predicting a single research outcome or a tentative explanation of the relationship between two or more variables. A hypothesis states a researcher's expectations concerning the relations between the variables in the research problem. It is the most specific statement of a problem.

Types of hypotheses

There are basically two types of hypotheses, namely: a research/alternative hypothesis and a null hypothesis.

Research hypothesis

A research hypothesis denoted by H_1, is a statement of an expectation about an outcome of a study. It is the hypothesis that the researcher wants to verify. Research hypotheses are stated in terms of dependent and independent variables. The statement involves linking these two types of variables. The research hypothesis, which is also called the alternative hypothesis, states that *'there is an effect of the independent variable on the dependent variable or that the two variables are related'*.

For example, the researcher may hypothesise that the teaching method (independent variable) has an effect on learning achievement (dependent variable) of children. Another example is: if the independent variable was attitude, and the dependent variable performance, the research hypothesis would be "there is relationship between students' attitudes and their performance in mathematics"

The statistical or null hypothesis

The statistical or null hypothesis denoted by H_0 states that there is no effect of the independent variable on the dependent variable. The null hypothesis, with reference to the aforementioned examples, would state that there is no effect of students' attitudes on their performance in mathematics. Also in the earlier example, it would state that there is no relationship between teaching method and pupils learning achievement in mathematics.

A research hypothesis is thus:
- an assumption about the status of events.
- an assumption about the relation amongst the variables of the study.
- a tentative explanation of the research problem.
- a possible outcome of the research.
- an educated guess about the research outcome.

A research hypothesis can be formulated
- from existing theories.
- based on some educational policy.
- from research findings of other studies.
- based on some evidences.
- from some commonly held beliefs.
- from some intuition.
- from exploratory studies especially designed for the purpose.

A research hypothesis should:
- be clear, specific and precise to guide the study.
- be especially verifiable to be meaningful to the researcher.
- not contain statements that are contradictory as this will put to question, the validity of the results.
- link dependent and independent variables that are measurable.
- describe only one issue for which they are specified.

8.   Identify the Delimitation/scope.

Scope is not the same as limitation. Limitation means factors or processes that control or reduce the progress of research activities while delimitation means establishing the research areas of coverage. Thus, the delimitation or scope of a study is defined in terms of sample, variables of concern, time, subject matter, location.

Chronogram

This has to do with breaking down the whole research process into components and attaching time line to each. What is produced is a chart showing when to do what in the course of implementing the research. There is need for the researcher, participants and sponsors of the research to agree on the time line attached to each activity as well as adhere to it. This would prevent unnecessary delay and drift in implementation of the research project.

This is illustrated in Table 1.

Table 1: Example of a chronogram Using a one year research plan

S/N	ACTIVITIES	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	Identify a Problem/Topic	■											
2	Doing the background Reading	■	■										
3	Doing the background writing			■	■								
4	Determine the methodology					■							
5	Data collection						■	■	■				
6	Data Analysis									■	■		
7	Writing the results											■	■

Conclusion

Every research officer needs to feel strong in the work to which he/she is committed. Researchers should be in a position to develop and execute research activities without many challenges. They need to be familiar with key research processes to enable them overcome bubby traps associated with research endeavours. Thus, workshops,on the job training seminars are useful avenues to illuminate and highlight issues concerning research technicalities comprising what to do, why you want to do that, constituent parts of each component – useful indicators of areas which need critical thinking.