

FMS825-RESEARCH METHODOLOGY CONCISE EXAM & COURSE SUMMARY (CE&CS)

WHATSAPP: <u>08181483701, 07082048274</u> MOTTO: EXCELLENCE IN YOUR ACADEMICS IS OUR WATCHWORD.

Enumerate the activities necessary in a scientific research process Problem Identification. A problem is an intellectual stimulus calling for a response in the form of scientific solution. The first stage in any research process is to identify the research problem(s).

Statement of Hypotheses about the Identified Problem(s). Stimuli (or problems) that are too general or too abstract present difficulties in the investigation and therefore requires concretization. This is attained by hypotheses. Hypotheses are regarded as tentative answers to researchable problems. The researcher breaks down a problem into a set of concrete hypotheses and investigates each separately. Consider the problem, "What brings youth to universities?" This involves considerations such as the motivation to study, the individual"s financial state, the social background of one"s family, encouragement by peers, and one"s academic achievements in secondary school.

These five considerations generate five hypotheses:



• the inclination to enroll at university increases with the motivation

to study;

• an individual"s financial state co-varies with his or her propensity to

study at the university;

- youth from relatively well to-do families tend to enroll at universities;
- the greater the encouragement to study at university given by peers,

the stronger the tendency to do so; and

academic achievement in secondary school co-varies with the

tendency to study at university.

Each of these hypotheses can be tested by observation on the

basis of which it will either be rejected or accepted. The rejection

option is the characteristic feature of hypotheses and the reason

for viewing them as tentative answers.

Research Design. A research design is the structure, program, and strategy

upon which hypotheses are evaluated.

Measurement. Measurement can be defined as any procedure whereby

observations are systematically assigned symbols. These symbols are

amenable to logical, mathematical and statistical manipulations that reveal

information that otherwise could not have been revealed. Symbols can be added, subtracted, percentaged, introduced as subjects or objects in sentences, or employed as elements in graphs and diagrams.

Data Collection. This is the stage whereby observations are made and recorded. Data can be collected in several ways including field observations and survey (for primary data), and journals and publications (for secondary data). Any data collection method can also be used to gather information concerning different hypotheses. **Data Analysis**. At this stage, all available data is analyzed according orebsjearicvhes, research questions, and hypotheses. The analytical method to be used will depend basically on the type of research as well as the research design. Empirical Generalizations. An empirical generalization is a statement

asserting universal connection between variables of interest. The logic whereby observations are transformed into empirical generalization is referred to as INDUCTION. We ma distinguish two types of inductive principles: one is the principle of enumeration in which inductive hypothesis is treated as being well established if it has not been refuted by experience. The other inductive principle is that of elimination, according to which an inductive hypothesis is taking to be well established if, while it has not been refuted by experience, alternative hypothesis have been so refuted.

Discuss briefly the guidelines for selecting a research topic

- (i) The topic must be of personal interest to the researcher
- (ii) The topic should be sufficiently original that it does not involve objectionable duplication.
- (iii) The topic must be researchable
- (iv) The topic must be significant. The topic must be capable of contributing to existing knowledge
- (v) The research into the problem must be feasible. The research should ensure that data are available.
- (vi) The topic must be consistent with the researcher"s competence,

interest and circumstance.

How does internal research proposal differ from an external research proposal

Internal Proposals

Internal proposals are regarded as being more succinct than external proposals. A three- page memo from the researcher to management , outlining the problem statement, study objectives, research design, and schedule is good enough to start an internal exploratory research. Privately and publicly operated businesses are usually concerned with how to solve a particular problem, make a decision, or improve an aspect of the business. Regardless of the intended audience, in the small-scale proposal, the literature review are not stressed and can be stated briefly in the research design. An executive summary is not mandatory for a small-scale internal research proposal. For funds to be committed however, it is necessary to provide time schedules and budgets for internal small-scale proposals.

External Proposals

An external proposal is either solicited or unsolicited. A solicited proposal is usually in response to a research need. Such proposal is likely competing against several other proposals for a grant. An unsolicited proposal represents a suggestion by a contract researcher for a research that might be done. An example is that of a consulting firm that proposes an omnibus study to a given trade association to address a problem arising from a change in the cultural or political-legal environment.

The most important parts of an external proposal are the objective, the design, qualifications, time schedule, and the budget. Note that in contract research, the results and objectives sections are the standards against which the completed project is measured. As the complexity of the project increases, more information will be required about the project management and the facilities and special resources.

Discuss the importance of an executive summary needed for a research proposal The aim of executive summary is to allow a busy manager or sponsor to quickly understand the thrust of the research proposal. The summary represents essentially an informative abstract, giving executives the opportunity to grasp the essentials of the proposal without reading the details. Another aim of the executive summary is to secure a positive evaluation by the executive who passes the proposal on to his or her staff for a full evaluation. The executive summary should therefore include the Following:

(i) Brief statement of the management dilemma and management question

(ii) The Research Objectives;

(iii) The Research Questions; and,

(iv) The benefits of your Research and your approach.

If the proposal is unsolicited, a brief description of your qualifications will

also be appropriate.

The research question appears to be at the heart of your case for research sponsor. The question that shapes what you present here would be: What is your core intellectual agenda? What is the research question that your proposal aims at answering and what is the significance of the research question? Is the research valuable to anyone? Who are the beneficiaries or "end users" of the research?

Explain the Elements of a Research design

1. Observations or Measures

These are symbolized by an 'O' in design notation. An O can refer to a single measure (e.g., a measure of body weight), a single instrument with multiple

items (e.g., a 10-item self- esteem scale), a complex multi-part instrument (e.g., a survey), or a whole battery of tests or measures given out on one occasion. If you need to distinguish among specific measures, you can use subscripts with the O, as in O1, O2, and so on.

Treatments or Programs

These are symbolized with an 'X' in design notations. The X can refer to a simple intervention (e.g., a one-time surgical technique) or to a complex hodgepodge program (e.g., an employment training program). Usually, a no-treatment control or comparison group has no symbol for the treatment (some researchers use X+ and X- to indicate the treatment and control respectively). As with observations, you can use subscripts to distinguish different programs or program variations.

Groups

Each group in a design is given its own line in the design structure. If the design notation has three lines, there are three groups in the design.

Assignment to Group

Assignment to group is designated by a letter at the beginning of each line (i.e., group) that describes how the group was assigned. The major types of assignment are: R = random assignment

N = nonequivalent groups

C = assignment by cutoff

Time.

Time moves from left to right. Elements that are listed on the left occur

before elements that are listed on the right.

List The Components of A Classic Research Design

- (i) Comparison;
- (ii) Manipulation;
- (iii) control;
- (iv) Generalisation

State the Sources of Data

 Publications. These include published data from such government agencies as the Federal Office of Statistics (FOS),
Nigeria Deposit Insurance Corporation (NDIC), Central Bank of
Nigeria (CBN), and the World Bank. These are the major
sources of secondary data. Experimentation: Data can be obtained through experiments. 3. Survey: With appropriate questionnaire instrument, reliable data can be obtained through survey.
Survey is the major source of primary data.

List the Overview of Data Collection Process

- 1. The critical incident method
- 2. Diaries
- 3. Focus group method 4. Interview method
- 5. Observation method
- 6. Protocol analysis
- 7. Questionnaires method
- 8. Inspection
- 9. Abstract from existing records

Outline the two major classifications of sampling designs and discuss them

- (i) Probabilistic Design
- (ii) Non Probabilistic Design

Probabilistic Design

In probabilistic sampling, the subjects of a given sample are chosen based on known probabilities.

Four most commonly used probabilistic sampling design include:

1. Simple random sampling

This is the design in which every subject in a given population has the same chance of being selected as any other subject. One useful technique in the use of simple random sampling is to list all subjects in the population from which the needed sample will be drawn.

Having done this, the researcher has two methods available for the selection of the needed sample:

Sampling with replacement

Sampling without replacement

2. Systematic sampling this is a non-random sampling design, though it requires random selection of a starting point. In the process, a researcher selects his or her respondents in saymstepmleatically using a sampling interval. By sampling interval we mean the gap between selections.

3. Stratified sampling

This is said to be a fair representation of Various strata within a given population of interest.

4. Cluster sampling

This is applicable in research situations where the subjects in the population of interest are distributed in clusters of geographical or ethnic settlements. The process involves the selection of an ethnic settlement at random. Then every single subject withit sheitstlement is used as one of the subjects in the sample.

Non – Probabilistic Design.

In non – probabilistic design, there is no probabilistic way of estimating the representative ness of the selected samples. It allows the researcher too much discretion in the selection of subjects and as such, it is not advisable to use this design in research statistical results, can be misleading and biased. Non – probabilistic designs include:

- 1. Convenience sampling- often referred to as accidental sampling.
- 2. Judgment sampling applicable in situations in which the researcher is guided by the belief that reference subjects will provide the required information for the given research process.
- **3. Quota sampling** mostly used in cases whereby the characteristics of the population of interest can be easily identified. It can ensure representative

ness in the choice of sample subject and hence it is similar to stratified sampling.

Characteristics of a Good Research Question

1. Research questions provide focus and direct attention to the major issues in the research project. Research questions determine therefore, what data to be sought for and how and where to look for them. Research questions must always be related to the problem being addressed in the research project. They should represent the critical issues in the study.

2. Although there appears to be no precise rule on the number of research questions to be formulated, the number should be neither too small as to exclude very important aspect s of the research problem, nor too large as to give rise to an unmanageable list of research questions. You should formulate as many research questions as will cover all the major issues in the research project.

3. You must make clear the language of the research question. The research question needs to be unambiguous. Research questions should be formulated in such a way that you can provide answers to them. Every research question you posed in the research project must be answered. As

much as possible, do not formulate research questions that lend themselves to only "yes" or "no" type of answers.

Outline the Characteristics of A Good Questionnaire.

- *Relevance
- *Consistency
- *Usability
- *Clarity
- *Quantifiability
- *Legibility.

State the Sources of Hypotheses

- 1. Experience: what you know about the problem under investigation
- 2. The Literature: from the review of related literatur e, you can obtain

useful ideas relating to possible solutions to the problem under

investigation

3. Theory: from theories you can derive hypotheses through the process of deductive reasoning, for example, "if A is true then B will be true."

4. Previous Findings: findings of previous studies can also serve as sources of hypotheses. Such findings may give rise to some new issues which needs to be resolved. Such issues then form the basis for formulating pertinent hypotheses. Also, deductions made from the findings of previous studies can be useful in formulating hypotheses.

Qualities of Good Hypotheses

1. Testable. It should be in such a way that empirical evidence relating to its validity can be obtained.

2. A statement of an expected relationship between two or more variables. The aim of using hypothesis is usually to find out how two or more variables are related. A good hypothesis should therefore, specify the expected relationship between the variables of interest in measurable terms.

3. Plausible. Hypotheses should be based on what is consistent with reasoning. It should not only relate to the problem of interest but also its likelihood as a solution to the problem should not be in doubt.

4. Consistent with current knowledge. A hypothesis should not contradict established knowledge. If it does, it will appear unreasonable.

5. Unambiguous. A hypothesis needs to be stated in clear unambiguous and simple terms. Any term you use in formulating the hypothesis should be operationally defined by you.

Define Editing and explain types of editing

Before a given data can be presented for analysis and interpretation, it must be edited and coded. By editing, we mean the examination of the given data in order to detect errors that may cause inconsistency if they are used for analysis in their original form. Through editing, these errors can be corrected accordingly.

There are two types of editing:

- 1. Field editing
- 2. Central editing

Field Editing

Field editing is a process whereby the researcher makes his or her records complete and correct without adding subjective information to his or her sources. It involves the presentation of collected information in a readable form such that all information gathered is properly reported.

Central Editing

Central editing ensures maximum consistency in information by correcting any inconsistency in the collected data, which might create problems in the analysis and interpretation of the results. There are four possible errors that should be watched out for in central editing:

1. Arithmetic or Numeric Errors. These are errors that involve the wrong recording of the units in responses. Information may be wrongly reported in months when they are requested to be in years.

2. Errors of Transposition. This error occurs when a response is entered in the wrong place. For example, a question that asks for the respondent's State of Origin may generate an answer about the ethnic group to which the respondent belongs.

3. Errors of Inappropriate Response. These errors occur when a respondent gives a relevant response but not in the exact form that is required.

4. Errors of Omission. These errors are difficult to edit and, in most cases, are interpreted to mean "no response"

Enumerate the Problems of Research in Developing countries

Scarcity of Data

Many social scientists in developing countries will attest to the fact that research data is difficult to get by in developing countries. No accurate population figures, no accurate and reliable income, expenditure, and balance of payments statistics. You will regularly find out that annual or time series data on important economic and/or business variables are often truncated. or abridged. At times, you find that time-series data on a country"s Gross National Product (GNP) or Gross Domestic Product (GDP) differ from source to source: those from the World Bank will differ from those from the Central Bank; those from the Federal Bureau of Statistics would differ from those of the World Tables, and so on. One thus wonders how a useful research can be carried out in such environment of paucity of research data.

The Lack of Research and Development (R & D) Culture

Researchers will agree that in many developing countries, especially in the African countries, research and development do not exist in the dictionary of business activities of many organised businesses. What you often observe is the continuous dependence on "the old way of doing thing"; the notion that if it works for the predecessors, it must work for us. You will also observe the famous culture of doing by imitation among manufacturing, and even education sub-sectors. At times, these sub-sectors find themselves stagnant and unable to find new, scientific, efficient, and effective ways of effecting positive changes.

The ultimate impact of this lack of research and development culture is ignorance of the importance of keeping accurate data. This is a serious research problem as accurate information is a necessary condition for effective research.

Inadequate Funding of Research Projects

It has been on record that research projects in developing countries are hardly properly funded. The problem is often attributed to either these countries" economic conditions or lack of government commitment to research. In this countries, political instability appears to be the order of the day. In most of the time, people who accidentally find themselves in government authorities may be those who do not understand enough to appreciate the contributions of research to national development. In these countries" universities, it appears the situation has assumed crisis dimension. Research has been coming to a halt due to lack of funds. The days of research grants are almost over. Academic staff stay as much as ten years without having one single research grant, either from within the country or from outside. A good number of these staff use their meager salaries to fund their individual research activities. They must either publish or perish.

Lack of Necessary Equipment, Facility and Research Material

In most developing countries, you will observe that the equipment, facilities and materials needed for meaningful research are either lacking or inadequate. This is especially the case in situations involving scientific experiments, where many researchers cannot find a single microscope in good working condition, or the chemical needed to undertake routine experiments for students. Where you find some of these equipments and facilities you will observe that they have either become obsolete or in a very bad state of repairs. This problem also exists in social sciences and education. You find it even difficult to obtain current journals, periodicals, and relevant textbooks.

Poor Com munication Network

The communication network for many developing countries is currently far from being well developed. This situation is a serious problem as it hampers educational, scientific and social research. The mail and telephone facilities in these countries cannot effectively be used in collecting data. In many occasions, no social research worker uses this means for data collection. This problem is compounded by lack of effective and efficient transportation system. Some research areas are so remote that they cannot easily be accessed by modern transport means. You observe that conducting a valid research under these conditions appears to make the whole affair unexciting and frustrating. This may sometimes lead to guess work by dishonest research consultants, where data are made up by unscientific assumptions. Census counts in Nigeria are good cases in point.