

**IQRA National University**

**Department of Electrical Engineering**

**Subject: Research Methodologies**

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## **Question No.1 (a)**

### **List down different steps involve in research process?**

#### **Answer:**

A Research process consists of series of actions or steps necessary to effectively carry out research and the desired sequencing of these steps

The following steps outline a simple and effective strategy for writing a research paper. Depending on your familiarity with the topic and the challenges you encounter along the way, you may need to rearrange these steps.

#### **Step One: Define the Problem**

The research process begins with the recognition of a problem or opportunity.

- At the very outset the researcher must single out the problem he wants to study, i.e. to decide area of interest.
- There are two steps involved in research process :
  - ❖ Understanding the problem thoroughly
  - ❖ rephrasing the same into meaningful terms from an analytical point of view
- The best way of understanding the problem is to discuss it with one's own colleagues or with those having the same expertise in the matter

#### **Step Two: Extensive Literature Survey**

- It is necessary for the researcher to conduct an extensive survey connected with the problem. For this purpose – Manuals ,Company Records ,journals, published data can be used
- Literature review is integral part of entire research process and makes valuable contribution to every operational step.
- Reviewing literature can be time-consuming, daunting and frustrating, but is also rewarding. Its functions are:
  - a) Bring clarity and focus to your research problem;
  - b) Improve your methodology;
  - c) Broaden your knowledge;
  - d) Contextualize your findings.

### **Step Three: Formulation the objective**

Objectives are the goals you set out to attain in your study. They inform a reader what you want to attain through the study. It is extremely important to word them clearly and specifically.

Objectives should be listed under two headings:

- a) Main objectives (aims);
- b) Sub-objectives.

The main objective is an overall statement of the thrust of your study. It is also a statement of the main associations and relationships that you seek to discover or establish.

### **Step Four: Determine Research Design**

Research Design step involves the development of a research plan for carrying out the study. There are a number of alternative research designs. The choice will largely depend on the research purpose. Types of Research Design

#### **Descriptive Study**

Descriptive Studies are undertaken in organizations to learn and describe the characteristics of a group of employees, as for example, the age, education level, job status, and length of service.

#### **Exploratory study**

Exploratory studies are study of collection of data in informal manner and unstructured Casual Study. A causal study is an inquiry to know the cause of one or more problems.

### **Step Five: Collecting the Data**

Published data are available in: Publications of central, state and local newspapers, Publication of foreign government or of international bodies, Technical or trade journals, Books, magazines and newspaper and Internet, Public record and statistics, historical documents and sources of public information.

Methods of Data Collection

- (a) Personal Interview
- (b) Questionnaire
- (c) Telephonic Interview

## Step Six: Analysis of Data

The Analyses of data can of two types: ' Quantitative analysis' Qualitative analysis thus analysis of data require a number of closely related operations such as establishment of categories, the application of these categories into raw data through tabulation, chart and then draw inferences. Analysis work is based on the computation of various percentage, coefficient etc.

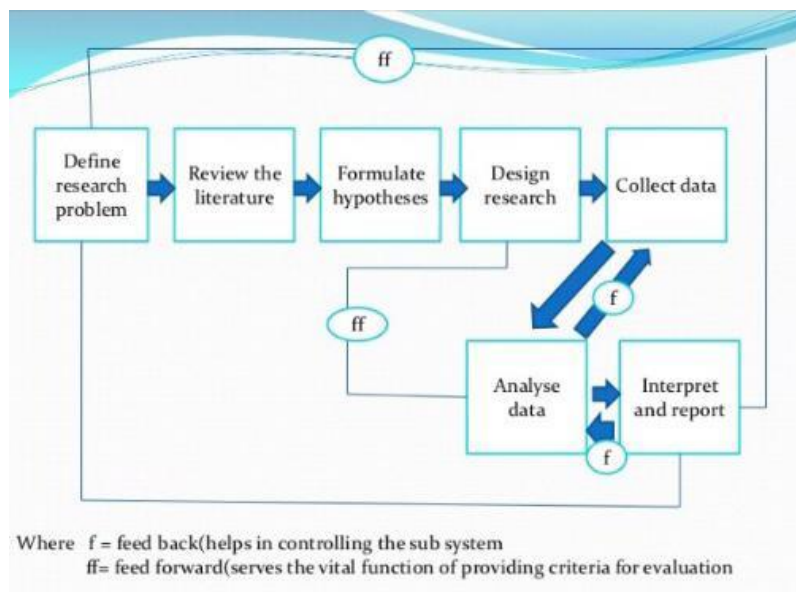
## Step Seven: Analyze and Evaluate the Information

1. Relate the information you have found and compiled, and your ideas from reading and thinking about the information, to your topic.
2. Analyze your notes.
3. Break down your notes into topic themes or categories decide how these themes or categories relate to your topic and discard notes that do not relate to your thesis
4. Look for holes in your thesis statement support and go back to find information you are missing
5. Do you have enough information to complete your research? If not, you may have to repeat several of the previous steps and/or extend the research process

## Step Eight: Prepare & Present the Final Research Report

Findings are presented often by research, objective should be in clear and concise way' it is a report that communicates properly and result to clients

Research process shown in the figure.



## **Question No 1 (b)**

### **Explain different steps involve in formulating a research problem?**

#### **Answer:**

A research problem can be any question that you want to answer and any assumption that you want to challenge or investigate

The formulation of a research problem is the first and most important step of the research process

#### **Step1:**

Identify a broad field or subject area of interest to you. Asked yourself, what is it that really interest me as a professional?

#### **Step 2:**

Dessert the broad area into subareas you will relies that all the broad areas mentioned above \_\_\_youth welfare, refugees, domestic violence, consumer behavior and HIV/AIDS have many aspect.

Profile of families in which DV occurs - Profile of the victims of DV - Profile of the perpetrators - Reasons of DV - Extent and types of DV - Impact of DV on the family - Impact of DV on children - Services available to the victims of DV - Effectiveness of the services provided to the victims of DV - Extent of DV in a community Domestic violence Steps in the formulation of a research problem

#### **Step 3:**

Select what is of most interest to you. - It is neither advisable nor feasible to study all subareas. - Select issues or subareas about which you are passionate.

#### **Step 4:**

Raise research questions 1.What is it that I want to find out about in the subareas?

Question 2.Asked the question what you want to find yourself in a situation.

#### **Step 5:**

Formulate your main objectives and your sub objectives - The main difference between objectives and research questions is in to behavioral aims by using action –oriented words such as to find out, to determine’ , ‘to ascertain and ‘to examine’

#### **Step 6:**

Assess your objectives - Now examine your objectives to ascertain the feasibility of achieving them through your research endeavor. - Consider them in the light of the time, resources (financial and human) and technical expertise at your disposal.

### **Step 7:**

Double-check. - Go back and give final consideration to whether or not you are sufficiently interested in the study, and have adequate resources to undertake it. - Ask yourself, am I really enthusiastic about this study? - Do I really have enough resources to undertake it? - Answer these questions thoughtfully and realistically.

### **Question No 2 (a)**

**A traditional research design is a blue print or detailed plan for how a research study is completed, list steps involved in planning a research study?**

#### **Answer:**

In any Research work the Research design play an important role because it is begin stage of any research. It we compare it with house architect then we found that blue color or lime line mark for digging foundation. Some function works with research design for research work .If our research design is making very strong by us then our research work automatically well planned and it is very useful for our society. A Research design is simply the framework or plan for a study that is used as a guide in collecting and analyzing the data. It is a blueprint that is followed in completing a study. Research design is the blue print for collection measurement and analysis of data. Actually it is a map that is usually developed to guide the research

Research design is a master plan specifying the methods and procedures for collection and analyzing the needed information

Research design is the plan, structure and strategy of investigation conceived so as to obtain answers to research questions and to control variance

Research is a complex process as well as an important plan. After deciding and explaining the problem, comes design. Research design is a systematic way of doing research. Thus, research design provides a particular directing to the research work. It helps the researcher to avoid deviation. Research design is always based as the problem, nature, objective and hypothesis of the research.

Research designs are used for the following purposes:

1. To minimize the expenditure
2. To facilitate the smooth scaling
3. To collect the relevant data and technique
4. To provide blue print for plans
5. To provide an overview to other experts
6. To provide a direction

## Steps involved in Planning a Research Study

- ✓ What is the study about?
- ✓ Why is the study being made?
- ✓ Where will the study be carried out?
- ✓ What type of data is required?
- ✓ Where can the required data be found?
- ✓ What periods of time will the study include?
- ✓ What techniques of data collection will be used?
- ✓ How will the data be analyzed?
- ✓ In what style will the report be prepared?

### Question No 2 (b)

**Differentiate between Qualitative and Quantitative Methods of research.**

**Answer:**

#### **Difference between Qualitative and Quantitative Research**

<b>Qualitative Research</b>	<b>Quantitative Research</b>
Methods include focus groups, in-depth interviews, and reviews of documents for types of themes	Surveys, structured interviews & observations, and reviews of records or documents for numeric information
Primarily inductive process used to formulate theory or hypotheses	Primarily deductive process used to test pre-specified concepts, constructs, and hypotheses that make up a theory
More subjective: describes a problem or condition from the point of view of those experiencing it	More objective: provides observed effects (interpreted by researchers) of a program on a problem or condition
Text-based	Number-based
More in-depth information on a few cases	Less in-depth but more breadth of information across a large number of cases
Unstructured or semi-structured response options	Fixed response options
No statistical tests	Statistical tests are used for analysis
Can be valid and reliable: largely depends on skill and rigor of the researcher	Can be valid and reliable: largely depends on the measurement device or instrument used

Time expenditure lighter on the planning end and heavier during the analysis phase	Time expenditure heavier on the planning phase and lighter on the analysis phase
Less generalizable	More generalizable

### Question No 3

**How study design is selected based on nature of investigation?**

**Answer:**

**Study design based on the Nature of Investigation:**

#### 1. Experimental

- ❖ If a relationship is studied by starting from the cause to establish the effects, it is called experimental study
- ❖ The independent variables can be observed, introduced, manipulated, and controlled by the researcher or someone else.

**Some issues to understand about Experimental Design:**

#### 1. Controlled or Natural Environment

- ❖ An experimental study can be carried out in either a ‘controlled’ or a ‘natural’ environment. In a controlled environment the study population is in a ‘controlled situation’ such as a laboratory or special room.
- ❖ In the natural environment the study population is exposed to an intervention in its own environment.

#### 2. Randomization

- ❖ Experimental studies can be further classified on the basis of whether or not the study population is randomly assigned to different treatment groups.
- ❖ In a Random Design, the experimental group or the control group is not predetermined but randomly assigned.
- ❖ This means each and every individual of a study population has an equal and independent chance of being assigned to an experimental or control group.



## **2. Nonexperimental**

- ❖ If a study focuses on starting from the effects to trace the cause, it is classified as a non-experimental study.
- ❖ Variables cannot be introduced/manipulated etc. As the assumed cause has already occurred. Instead, the researcher retrospectively links the cause to the outcome

## **3. Quasi or semi experimental**

- ❖ A mixture of traits of both experimental and nonexperimental study designs