UNIT 3  STEPS IN RESEARCH

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3.0  INTRODUCTION

Research process is similar to undertaking a journey with specific mission. Before starting the journey we decide where you want to go and which route to follow. If the route is known to you don’t need anybody guidance but if there are more than one route towards destination than you have to decide which route is most suitable to reach the destination. Now you look upon the research process in this context. Your first decision would be ‘what you want to find out about ‘or in other words what research question to be answered to. After deciding the research question or problem you should now decide ‘how to go about finding there answers’. Therefore precisely the path to finding answers to research questions constitutes research methodology. In research process you passed through some practical steps in order to find out the answers of research questions. This unit will familiarize you with important steps needed for conducting a research. You will provide a quick glance at the whole process of research to acquaint you with the various tasks you faced to undertake to carry out your research / study. It will give you some idea of what the research journey involved. Finally this unit will cover the total spectrum of research and endeavor starting from the problem through to writing a research report and publication.

3.1  OBJECTIVES

After reading this unit, you will be able to:

•  Identify the various steps needed for conducting a research;
•  Explain the whole process of research in simple manner;
Discuss how theoretical knowledge can be further applied to undertake a research; and

Analyse the importance of each steps involved in research process.

3.2 RESEARCH PROCESS

The goal of the research is to find the truth and to use a scientific method that results in a reasonable and sound answers to important questions that will further our understanding of human behaviour. Research process consists of series of actions and steps needed for conducting scientific research. If the researcher follows certain steps in conducting the research, the work can be carried smoothly with least difficulty. The proposed flowchart given below illustrates the research process:

The research process consists of a number of closely related activities as shown through step I to step X, but such activities overlap continuously rather than following strictly prescribed sequence. The order of various steps shown provides a useful procedural guidelines regarding research process. Details of each of the research stages is given underneath.

3.2.1 Identification of the Problem

The first and most important step for identifying a problem is asking a question or identifying a need that arises as a result of curiosity and to which it becomes necessary to find an answer. The psychological studies are focused on one or many of the following kinds of questions:

- What are the events that cause or determine a given behaviour or response?
- What is the nature of behaviour or action (i.e., its structure) and how it is linked with other actions and behaviours?
- What are the relationships of internal psychological processes with behavioural phenomenon?

The research question determines the direction of the study. The researchers have to struggle a lot in identifying and articulating the same. Essentially two steps are involved in formulating the research problem, viz. understanding the problem thoroughly, and rephrasing the same into meaningful terms from an analytical point of view. The main function of formulating a research problem is to decide what you want to find out about.

It is extremely important to evaluate the research problem in the light of:

a) Financial resources at your disposal.

b) The time available with you and your research supervisor.

c) The supervisor’s expertise and knowledge in the field of study.

d) Your own expertise and knowledge.

e) Whether you have sufficient knowledge about computers and software if you plan to use them.

It is equally important to identify any gaps in your knowledge of relevant disciplines, such as statistics required for analysis.
3.2.2 Review of Literature

For identifying a good solvable problem, the investigator undertakes the review of literature. A body of prior work related to a research problem is referred to as literature. Scientific research includes a review of the relevant literature. When a researcher reviews the previous researches in related fields, he becomes familiar with several known and unknown phenomena. Therefore one obvious advantage of review of the literature is that it helps to eliminate duplication of what has already been done and provides guidance and suggestions for further research. The main purpose of review of the literature is fourfold:

a) It gives an idea about the variables which have been found to be conceptually and practically important and unimportant in the related field. Thus the review of literature helps in discovering and selecting variables relevant for the given study.

b) The literature provides an estimate of the previous work and provides an opportunity for the meaningful extension of the previous work.

c) A review of literature helps the researcher in systematically compiling the expanding and growing body of knowledge.

d) Review also facilitates in drawing useful conclusions regarding the variables under study and provides a meaningful way of their subsequent applications.

e) A review of the literature also helps in redefining the variables and determining the meanings and relationships among them so that the researcher can build up a case as well as a context for further investigation that has merit and applicability.

There are different sources of review of literature such as journals, books, abstracts, indexes and periodicals. If you are unsure about what journals and other resources to examine for research idea you should know that the computer search engine PsycINFO is a very effective tool for going through the technical literature. The print companion to PsycINFO is psychological abstracts and both of theses contain abstracts of articles from almost all journals that publish psychological research. If you find an abstract of interest, you can then read the entire article for additional information.

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<td>Indicate whether True / False</td>
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<td>1) The first step of research process is identifying a problem.</td>
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<td>2) Hypothesis are formed after formulating a research design.</td>
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<td>3) Preparation of report and publications of research study allow the other researchers to replicate the study.</td>
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<td>4) Operational definitions of the variables is not necessary for the purpose of measurement.</td>
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<td>5) Selection of particular data collection depends on the nature of study.</td>
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3.2.3 Formulating a Hypothesis

When the researcher has identified the problem and reviewed the relevant literature he formulates a hypothesis. From a careful examination of relevant theory and previous findings, the psychologist would be able to state one or more prepositions whose validity could be tested. Ideally these hypotheses would be based on a deductive theory but they may simply be new hypotheses or hypothesis based on previous research findings.
Hypothesis may be defined as a tentative statement showing a relationship between variables under study. It is stated in the form of a declarative sentence. For instance suppose you are interested to know the effect of reward on learning. You have analysed the past research and found the indication that the two variables are positively related. You need to convert this idea in terms of a testable statement. At this point you may develop the following hypothesis.

Those who are rewarded shall require lesser number of trials to learn the lesson than those who are not rewarded.

Hypothesis plays the key role in formulating and guiding any study. The hypotheses are generally derived from earlier research findings, existing theories, and personal observations and experiences. For unbiased research, the researcher must formulate in advance of the data-gathering process. No hypothesis should be formulated after the data are collected.

### 3.2.4 Identifying, Manipulating and Controlling Variables

While talking about the hypothesis you will encounter the word, ‘variable’ in the scientific literature in psychology. Variables are defined as those characteristics which are manipulated, controlled and observed by the experimenter.

At least three types of variables must be recognised at the outset – the dependent variable, the independent variable and the extraneous variable. The dependent variable is one about which the prediction is made on the basis of the experiment. In other words the dependent variable is the characteristics or condition that changes as the experimenter changes the independent variables. The independent variable is that condition or characteristics which is manipulated or selected by the experimenter in order to find out its relationship to some observed phenomena. An extraneous variable is the uncontrolled variable that may affect the dependent variable.

The experimenter is not interested in the changes, produced due to the extraneous variable and hence, he tries to control it as far as practicable. The extraneous variable is known as the relevant variable. In order to make a variable clear, precise and easy to communicate it is important that it is operationally defined. An operational definition involves specifying the actual operations that defines a given variable. Operational definition is also important for the purpose of measurement. Since psychological variables are complex and their measurement poses special problems, psychologists use operational definitions. They frequently use report (verbal) measures, behavioural measures and psychological measures of variables in their studies, which help him or her to specify the operations and may allow quantification.

### 3.2.5 Formulating a Research Design

A research design may be regarded as the blueprint of those procedures which are adapted by the researcher for testing the relationship between the dependent variable and the independent variable. There are several kinds of experimental designs and the selection of any one is based upon the purpose of the research, types of variables to be controlled and manipulated as well as upon the conditions under which the experiment is to be conducted. The main purpose of experimental design is to help the researcher in manipulating the independent variables freely and to provide maximum control of the extraneous variables so that it may be said with all certainty that the experimental change is due to only the manipulation of the experimental variable. The main function of a research design is to explain how you will find answers to your research questions. The research design sets out the logic of your inquiry. It includes the study design and the
logistical arrangements that you propose to undertake as well as the measurement procedures. It includes also the sampling strategy, the frame of analysis and the time frame. For any investigation the selection of an appropriate research design is crucial to enable the researcher to arrive at valid findings, comparisons and conclusions.

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<td><strong>2)</strong> What is a research design? How is it formulated and what are its uses?</td>
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<td><strong>3)</strong> What is meant by manipulating the independent variable, controlling the extraneous variable and avoiding the error variance?</td>
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### 3.2.6 Constructing Devices for Observation and Measurement

When the research design has been formulated the next step is to construct or collect and choose appropriate tools of research for scientific observation and measurement. Depending on the nature of research problem a researcher may choose particular method (e.g. observation, experiment, case study, correlation, and survey). If readymade tools are not available then the researcher may have to develop appropriate tools before undertaking the study. All these tools of research are the many methods through which data are collected by asking for information from person rather than observing them.

### 3.2.7 Sample Selection and Data Collection

After deciding the tools for the study the research one must also decide about the participants of the study for which purpose usually a small sample is drawn which represents the population. Then the actual study proceeds. Observations are made of the variables of interest, which involves an experiment in which all variables are carefully controlled. Field study or a field experiment or survey may be conducted. Whatever method is selected, the point is that the investigator is observing the variables of interest.
3.2.8 Data Analysis and Interpretation

After making observation the data collected are analysed with the help of various quantitative and qualitative statistical techniques. Careful scrutiny of the data is a critical aspect of scientific method. The purpose of the analysis is to make sense of the data and see what light they throw on the problem and the hypotheses of the study.

3.3 HYPOTHESIS TESTING

After analysing data, the researcher is in a position to test the hypothesis. Do the facts support hypotheses, or they happen to be contrary. This is the usual question which should be answered while testing hypotheses. Various parametric and non-parametric tests have been developed for this purpose. The hypothesis may be tested through the use of one or more of such tests, depending upon the nature and object of research inquiry. Hypothesis testing will result in either accepting or in rejecting it.

3.4 DRAWING CONCLUSIONS

The investigator after analysing the result draws some conclusions. In fact the investigator wants to make some statement about the research problem which he or she could not make without conducting the research. It is during this phase that the hypotheses are accepted or rejected. At the same time the conclusions of the study are related to the theory or research findings from which the hypotheses originally came. Depending on the new findings the original theory may have to be modified.

3.5 PREPARATION OF REPORT AND PUBLICATION

This is the last step in most of the research studies. The researcher documents all the steps of his or her research in clear terms. This report informs the reader about what the researcher has done, what has been discovered and what conclusion the researcher has drawn from findings. If the researcher is clear about the whole process the person will also be clear about the way he or she wants to write the report. This helps the reader to understand the study and use it for various purposes. It allows one to replicate the study. The publications of study in scientific journals or books make the work available for wider dissemination.

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<td>2) What is meant by data collection?</td>
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3) What are the steps involved in data analysis and interpretation?

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4) Define Hypothesis testing.

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3.6 LET US SUM UP

This unit has provided an overview of the research process. The steps of research process includes problem identification, formulation of hypothesis, identification manipulation and controlling of the variable, formulation of research design, constructing devices for observation, sample selection and data collection, data analysis and interpretation, drawing conclusions and preparation of report and publications. The nine steps cover total spectrum of the research endeavor. The steps are in operation following a logical sequence and detailing the various methods and procedures in a simple step – by – step procedure.

3.7 UNIT END QUESTIONS

1) Enlist the steps involved in research process?

2) Explain the importance of research questions in psychological research?

3) What is the role of review of literature in research process?

4) Why formulates of hypothesis is necessary while conducting it?

5) How the steps in the research process do helps a person to get knowledge?

3.8 SUGGESTED READINGS


Kumar, R (2006), Research Methodology. Dorling Kingsley, New Delhi)