Unit 1 - Importance of Research, Significance of Research etc.

Research Methodology (Visvesvaraya Technological University)

Module 1

Introduction to Research

Meaning of Research

In the modern complex world every society today is faced with serious social, economic & political problems. These problems need systematic, intelligent and Practical solutions. Problem solving is technical process. It requires the accumulation of new knowledge. Research provides the means for accumulating knowledge & wisdom. In other words, research is a systematic effort of gathering analysis & interpretation of problems confronted by humanity. It is a thinking process and scientific method of studying a problem and finding solution. It is an in-depth analysis based on reflective thinking.

Definitions

Research in common parlance refers to a search for knowledge. One can also define research as a scientific and systematic search for pertinent information on a specific topic. Research is an academic activity and the term should be used in a technical sense.

a) -William Emory defines Research as "any organised enquiry designed and carried out to

provide information for solving a problem"

b) The new Oxford English Dictionary defines research is "the scientific investigation into and study of material, sources etc. in order to establish facts and the reach new conclusions".

c) Redman and Mory defines, research as "a systematised effort to gain new knowledge".

d) "A careful investigation or inquiry specially through search for new facts in any branch of knowledge" Advanced Leaner's Dictionary.

Characteristics of Research

The above definitions reveal the following characteristics of Research

1. Research is a systematic and critical investigation into a phenomenon. It emphasizes that a researcher should employ a structured procedure.
2. The research should focus on priority problems.
3. The research should be reductive. This means that the findings of one researcher should be made available to other researchers to prevent them from repeating the same research.
4. The research should be replicable. This asserts that there should be scope to confirm the findings of previous research in a new environment and different settings with a new group of subjects or at a different point in time.
5. The research should be generative. This is one of the valuable characteristics of research because answering one question leads to generating many other new questions.
6. The research should be action-oriented. In other words, it should be aimed at reaching a solution leading to the implementation of its findings.
7. The research should follow an integrated multidisciplinary approach, i.e., research approaches from more than one discipline are needed.
8. It is not mere compilation of facts.
9. It adopts scientific method.
10. It is objective & Logical
11. It is based on empirical evidence.
12. Research is directed towards finding answers to questions
13. It emphasis the generalisation of theories and principles.

Objectives of Research

The purpose of research is to discover answers to questions through the application of scientific procedures. The main aim of research is to find out the truth which is hidden and which has not been discovered as yet. Though each research study has its own specific purpose, we may think of research objectives as falling into a number of following broad groupings:

1. To gain familiarity with a phenomenon or to achieve new insights into it (studies with this object in view are termed as exploratory or formulative research studies);

2. To portray accurately the characteristics of a particular individual, situation or a group (studies with this object in view are known as descriptive research studies);

3. To determine the frequency with which something occurs or with which it is associated with something else (studies with this object in view are known as diagnostic research studies);

4. To test a hypothesis of a causal relationship between variables (such studies are known as hypothesis-testing research studies).

Motivations in Research

What makes people to undertake research?

The answer is as follows.

1. Desire to get a research degree along with its benefits.

2. Desire to face the challenge in the solving the unsolved Problem.

3. Desire to get intellectual joy of doing some creative work.

4. Desire to be of service to Society.

5. Desire to get respectability.

Importance of Research

"All progress is born of enquiry. Doubt is often better than overconfidence, for it leads to enquiry & enquiry leads to investigation". Research has an important role in guiding social plan. Knowledge of the society & the cultural behaviour of the people require proper planning for their well development. Because knowledge & cultural behaviour of human being are interdependent. A reliable knowledge is needed for planning & this is possible only through research.

Knowledge is a kind of power with which one can face the implication of a particular Phenomenon.

Research provides the basis for all government policies in our economic system.

Research helps us in making predictions. Eg. Chernobil Nuclear, nuclear plant disastrous, Bhopal gas disastrous.

Research is equally important in seeking answer to various social problems In addition to this, the significance of research can be understood with the following points.

1. To the students who are to write a PhD; it is careerism.

2. To Professionals in research methodology, research means a source of live hood.

3. To Philosophers & thinkers research may mean the outlet for new ideas and insights.

4. To literary man research means the development of new styles & creative work.

5. To the intellectuals research mean the generalisation of new theories.

Research Method & Research Methodology

It is necessary to explain the differences between research methods & research methodology. Research methods may be understood as all those methods & techniques that are used for conducting research. Research methods, thus refer to the methods the researcher use in performing the research operations. In other words all those methods which are used by the researcher during the course of his research problem are termed as as research methods.

Research methodology is a way to systematically solve the research problem. It may be understood as a science of studying how research is done scientifically. Abraham Kaplan defines research methodology in this way. Research methodology is "the description, explanation & Justification of various methods of conducting research".

Research Methodology has many dimensions and research methods do constitute a part of Research Methodology. The scope of Research Methodology is wider than that of research methods. "Thus, when we talk of research methodology we not only talk of the research methods but also considered the logic behind the methods we use in the context of our particular method or technique & why we are not using others. So that research results are capable of being evaluated either by the researcher himself or by others" Why a research

study has been undertaken how the research problem has been defined in what way & why the hypothesis has been formulated, what data have been adopted etc ate usually answered when we talk of Research Methodology.

Research Method	Research Methodology
Research methods are the methods used by researchers to collect data to conduct research on a particular research topic.	A Research methodology is systematic approach to solve the research problem and to reach a new conclusion.
The objective of the research method is to find the solution.	The objective of the research methodology is to determine the solution by applying correct procedures of research.
Research methods are useful to apply during the latter stage of the research process.	Research methodologies are applied in the initial stage of the research being conducted.
Research methods are small part of research methodology.	A Research methodology is a multi-dimensional concept.
Research methods consist of various techniques where various studies and experiments are used to conduct research and reach an appropriate conclusion.	Research methodologies are used applied during the initial stage of the research to explain the purpose of chosen methods and how they will serve its function.
Research methods consist of different investigation techniques.	Research methodologies are a systematic strategy to achieve the decided objective.
Research method encompasses of carrying out an experiment, survey, test and so on.	Research methodology encompasses different techniques which are used during the performance of the experiment, surveys, and test, etc.

Types of Research (Refer C. R Kothari's Text book which I have shared)

Research is classified into different forms on the basis of intent & methods.

The following are the different types of research.

1. Descriptive Vs Analytical

Descriptive research includes Surveys or fact-finding enquiries of different kinds. The major purpose of descriptive research description of the state of affairs as it exists at present. The main characteristic of this method is that the researcher has no control over the variables; He can only report what has happened or what is happening.

In Analytical research, on the other hand the researcher has to use facts or information already available & analyse this to make a critical evaluation, of the material.

2. Applied Vs Fundamental

Research can either be applied (or action) research fundamental (or pure) research Applied Research aims at finding a solution for an immediate problem facing a society or an organisation whereas Fundamental Research is mainly concerned with Generalisation and with the formulation of a theory. 'Gathering knowledge for knowledge' is termed pure research. Research studies concerning natural phenomenon, human behaviour etc are examples of Fundamental Research. But Research aims at certain conclusion facing a concrete social problem is an example of Applied Research.

3. Qualitative Vs Quantitative

Quantitative Research is based on the measurement of quantity or amount. It is applicable to

a phenomenon that is phenomenon relating to or involving quality or kind. Qualitative Research is specially important in the behavioural sciences were the aim is to discover the underlying motives of human behaviour.

4. Conceptual Vs Empirical

Conceptual Research is that related to some abstract ideas for theory. It is generally used by philosophers and thinkers to develop the new concepts or to interpret existing ones. On the other hand Empirical Researches relie on experiments or observation alone, often without due regard for system of theory. It is data based research coming up with conclusions which are capable of been variable of observation and experiment.

5. One Time Research or Longitudinal Research

In the formal case the research is confined to a single time period, whereas the later case the research is carried on over several time periods.

6. Laboratory Research and Field setting Research

This classification is based on the environment in which research is carried out.

7. Historical Research

Historical Research is that which utilities historical sources like documents remains etc to study events ideas of the past including the philosophy of persons and groups at any remote point of time.

Research Process (Refer C R Kothari's Text Book)

The Research Process is the Paradigm of research project. In a research project there are various scientific activities. The research process is a system of Interrelated activities. Usually research begins with the selection of a problem. The various stages in the research process are explained in the above diagram. Research is a cyclical process. If the Data do not support the hypothesis, research is repeated again.

C.R. Kothari in his book, "Research Methodology: Methods & Techniques" presents a brief overview of a research process. He has given the following order concerning the Research Process.

1. Formulation the Research problem

2. Extensive Literature survey

3. Developing the hypothesis

4. Preparing the research design

5. Determining sample design

6. Collection of Data

7. Execution of the Project

8. Analysis of Data

9. Hypothesis testing

10. Generalisation & Interpretation

11. Preparation of the report.

Problem Formulation

In Research process, the 1st and foremost step is that of selecting properly and defining a research problem. The researchers must find the problem and formulate it so that it becomes susceptible research. Like a doctor, a researcher must examine all the symptoms concerning a problem before he can diagnosis correctly.

"A problem well put is half solved". This saying highlights the importance of proper formulation of the selected problem. The primary task of Research is the collection of relevant data and the analysis of data or finding answers to research questions.

What is a Research Problem?

A Research problem in general refers to some difficulty the researches experiences in the context of a theoretical or practical situation and wants to obtain a solution for the same.

The term problem means a question or issue to be examined. The term problem originates from the Greek word 'Probellim' - meaning anything that thrown forwards, a question proposed for solution, a matter stated for examination.

Selection of a Problem

The Research problem undertaken for study must be carefully selected the task is a difficult one, although it may not appear to this. So in this connection researcher can seek the help of a guide.

However the research problem cannot be borrowed. A problem must spring from the mind of researcher like a plant spring from its seed. A research guide can only help a researcher to

choose the subject. The following paints may be observed by the researcher in selecting a research problem.

1. Subject which is overdone should not be chosen.

2. Controversial subjects should not be taken.

3. Too narrow or too wide problems should be avoided.

4. The subject selected for research should be familiar and feasible.

5. The subject should be within our time limit.

6. The subject should be within our affordable budget.

Sources of Problem

The sources from which one may be able to identity research problems are

1. Reading

When we critically study and articles relating to subject of our interest, pertinent questions may arise in our mind. Similarly areas of research may strike to our mind when we read research reports.

Academic Experiences

Classroom lectures, class discussions seminar discussions and out -of-class exchanges of ideas with fellow students and professors will suggest many stimulating problems to be studied.

Daily Experience

Life is dynamic. We learn new things and undergo new experiences every day. It we are all inquisitive and sensitive to like situation we may bit upon questions worth of investigation. The story about Newton testifies to this. Apples have fallen on the beads of people before

Newton. But it was sensitive Newton alone raised the question regarding fall of apple which led to the discovery of Law of gravitation.

Consultation

Discussion with experts, researchers etc. will help to identify meaningful problems of research.

Field situation

Field visits, training and extension work provide exposure to problems which call for study.

Brain storming

Intensified discussion within a group of interested person may often be a means of identifying pertinent questions and of developing new ideas about a problem.

Intuition

Sometimes new ideas may strike to one's mind like a flash reflective mind is spring of knowledge. Eg. Sri Buddha.

Techniques of formulating Research Problem

How to define a Research Problem is undoubtedly a herculean task. However it is a task that must be talked intelligently. The usual approach is that the Researcher should himself pose a question and set techniques and procedure for throwing tight none the problem.

Defining a Research Problem properly and clearly is a crucial part of Research study and must in no case should accomplished hurriedly. However in practice this is frequently overlooked.

The techniques involved in defining and formulating a Research problem are as follows.

1. Statement of the problem in a general way

2. Understanding the nature of the problem

3. Surveying the available literature

4. Developing ideas through discussion

5. Rephrasing the Research Problem.

1. Statement of the problem in a General way

First of all the problem should be stated in broad general way keeping in view either some practical concern or some scientific or intellectual interests. For the purpose the researcher must immerse himself thoroughly in the subject matter concerning which he wishes to pose a problem. In Research, some preliminary survey or Pilot Survey is desirable. Then he can himself state the problem or be can seek the help of a guide. Often the guide puts forth the problem in general terms, and then it is up to the Researcher to narrow it down and phrase the problem in operational term.

The stated problem may have various ambiguities that must be resolved by cool thinking and thinking at the same time the feasibility of particular solutions has to be consider and the same should be kept in view wild stating the problem.

2. Understanding the nature of the problem.

The next step in defining the problem is to understand its origin and nature clearly. The best way of understand the problem is to discuss it with those who 1st raised it in order to find out how the problem originally came out and with what objectives in view. If the researcher has stated the problem himself, he should consider once again all those points that induced him to make a general statement concerning the problem. For a better understanding of the nature of the problem involved, he can enter into discussion with those who have a good knowledge of the problem concerned or similar other problems. The researcher should also keep you the environment within which the problem is to be studied or understood.

3. Surveying the available literature

All the available literature concerning the problem at hand must necessarily be surveyed and examined before a definition of research problem is given. He must be conversant with relevant theories in the field, report and the records as also of all other relevant literature. He

must devote sufficient time in reviewing of research already undertaken on related problems. This is done to find out what data and other materials, if any, are available for operational purposes. This would also help the researcher to know if there are certain gaps in the theories or whether the existing theory applicable to the problem study are in consistent with each other, or whether the findings of different studies do not follow pattern consistent with the theoretical expedition and so on. All these enable a research to take new strides in the field of Furtherance of knowledge that he can move to starting from the existing premise studies on related problems are useful for indicating the type of difficulties that may be encountered in the present study as also the possible analytical short coming. At times such studies also suggest useful and even new lines of approach to the present problem.

Developing ideas through discussion

Discussion concerning a problem often produces useful information. Various new ideas can be developed through such an exercise, hence, a researcher must discuss him problems with his colleagues and others who have enough of experience in the same area or in working on similar problems. This is known as experience survey. People with rich experience are in a position to enlightened the researcher firm

Rephrasing the Research Problem

Finally the researcher must patiently sit to rephrase the research problem into a working proposition- Once the nature of the problem has been clearly understood, the environment (with in which the problem has to be studied) has been defined, discussion over the problem have taken place and the available literature has been surveyed and examined rephrasing the problem into analytical or operational terms is not a difficult task. Through rephrasing the researcher puts the research problem in as specific terms as possible so that it may become operational and may help in the development of working hypothesis.

While defining a Research Problem the following points also may be noted.

a) Technical terms should be clearly defined

b) Basic Assumptions should be clearly defined

c) A straight forward approach should be provided

d) The suitability of time period and the source of data must be considered.

e) The scope of investigation and the limit of investigation should also we defined.

Literature Review

A literature review is a comprehensive summary of previous research on a topic. The literature review surveys scholarly articles, books, and other sources relevant to a particular area of research. The review should enumerate, describe, summarize, objectively evaluate and clarify this previous research. It should give a theoretical base for the research and help you (the author) determine the nature of your research. The literature review acknowledges the work of previous researchers, and in so doing, assures the reader that your work has been well conceived. It is assumed that by mentioning a previous work in the field of study, that the author has read, evaluated, and assimilated that work into the work at hand.

A literature review creates a "landscape" for the reader, giving her or him a full understanding of the developments in the field. This landscape informs the reader that the author has indeed assimilated all (or the vast majority of) previous, significant works in the field into her or his research.

Importance of Literature Review

- To provide an organised overview of existing research on a specific topic
- To take a critical and evaluative perspective toward published research
- To summarise, synthesise and analyse the arguments of other authors
- To uncover similarities and differences or consistencies and inconsistencies within existing research
- To identify a gap within the body or research
- To help you generate and justify your research question and hypotheses Learning Development Service

Literature Research Gap

Literature research gap is the missing or incomplete piece of data in the literature, which has not been explored or ventured into so far. It can be anything to everything from a population of sample-sizes, types, etc. It may arise due to not understanding the working of particular

instruments, new technological advances or studying a new organism that has been recently discovered.

Research Gaps can be located in the introduction section of research articles, discussions and future research sections in research papers or journals, which researchers have already published. Finding these gaps and doing a research study on it is a novel way and a way to provide more information about the particular gap to the scientific community.

Sources of Literature

Primary Source

The term ***primary source*** is used broadly to embody all sources that are original. Primary sources provide first-hand information that is closest to the object of study. Primary sources vary by discipline.

- In the natural and social sciences, original reports of research found in academic journals detailing the methodology used in the research, in-depth descriptions, and discussions of the findings are considered primary sources of information.
- Other common examples of primary sources include speeches, letters, diaries, autobiographies, interviews, official reports, court records, artifacts, photographs, and drawings.

Secondary Source

A ***secondary source*** is a source that provides non-original or second hand data or information.

- Secondary sources are written about primary sources.
- Research summaries reported in textbooks, magazines, and newspapers are considered secondary sources. They typically provide global descriptions of results with few details on the methodology. Other examples of secondary sources include biographies and critical studies of an author's work.

Examples:

	Primary Source	Secondary Source
Art	Original artwork	Article critiquing the piece of art
History	Diary of an immigrant from Vietnam	Book on various writings of Vietnamese immigrants from the 1970s
Literature	Poem	Article on a particular genre of poetry
Political Science	Treaty	Essay on Native American land rights
Science or Social Sciences	Report of an original experiment	Review of several studies on the same topic
Theater	Video of a performance	Biography of a playwright

Monographs

Research Monographs are "separately published reports on original research that are too long, too specialized, or otherwise unsuitable for publication in one of the standard journals. Each Monograph is self-contained, frequently summarizes existing theory or practice before presenting the author's original and previously unpublished work, and is likely to be one of a series of such research monographs in the same field." However, it may be added that ordinarily a monograph is a short treatise. It differs from a treatise in the same that it is a work done on a more limited scale. Otherwise both have the same features and serve same purposes. A research monograph presents results of original research.

Examples:

Creativity and the prepared mind, by Ray Hyman (National Art Education Association, Research Monographs), Washington, DC, national Art Education Association.

(*A Monograph has some common characteristics with books and review (survey) papers. A monograph is a special type of book written on a single specialized topic, devoted mainly for research works; could pose some unsolved problems and may provide detained explanation*

of some research papers. So, it is like a big survey paper, but it does not appear in journals; it rather appears the way most books appear. A book is written works on a broad range of topics belonging usually to the same subject area.

Unlike review papers, a research paper is a document containing original results or findings.

*The word monograph is derived from the Greek "mono" (single) and grapho (to write), meaning "writing on a single subject"***)**

Treatise

A treatise is a formal and systematic written discourse on some subject, generally longer and treating it in greater depth than an essay, and more concerned with investigating or exposing the principles of the subject and its conclusions. A monograph is a treatise on a specialized topic. A treatise is a formal written paper about a specific subject. It's like an essay but longer. The definition of a treatise is a formal, written article or book that deals with the facts, evidence and conclusions on a specific subject.

An example of a treatise is a formal written analysis of the causes of a war.

Tools of Literature Review

https://motivatedacademic.com/phd-tools-to-improve-literature-review/

Hypothesis

Definition

1. In the words of George A. Lund Burg " a hypothesis is a tentative generalization the validity of which remains to be tested……In its most elementary stage the hypothesis may be very bunch, guess, imaginative data, which becomes the basis for action or investigation".

2. Goode and Hatt defined it as " a proposition which can be put to test to determined its validity".

3. Rummel " a hypothesis is a statement capable of being tested and there by verified or rejected".

Need (importance) of Hypothesis

In all analytical and experimental studies hypothesis should be set up in order to give a proper direction to them. Hypothesis are useful and the guide Research Process in proper directions.

In addition to put in the theory to test, a hypothesis has to perform certain other functions.

In many ways it is a guiding print to research. Young says "Formulation of hypothesis gives definite the point of enquiry aids in establishing direction in which to proceed and help to delimit the field of enquiry".

The use of hypothesis prevents a blind search and indiscriminate gathering of data which may later prove irrelevant to the problem under study.

In the data collection hypothesis serves as the forerunner.

A Researcher based on hypothesis can save a lot of time and keep the researcher from considerable amount of confusion.

Hypothesis is helpful in directing the researcher to find out order among facts.

Hypotheses have also certain practical values to society besides serving as a means for seeking solution to various problems, they help in understanding the social phenomena in the proper perspective.

Sources of Hypothesis

Hypothesis can be derived from various sources.

1. Theory

This is one of the main sources of hypothesis. It gives direction to research by stating what is known. Logical deduction from theory leads to new hypothesis.

2. Observation

Hypothesis can be derived from observation. For example, from observation of price behaviour in a market the relationship b/w price and demand of an article can be hypothesised.

3. Analogies

Analogies are another sources of hypothesis. Julian Hexley has pointed out that causal observation in nature or in the framework of another science may be a fertile source of Hypothesis.

4. Intuition and personal experiences

Intuition and personal experiences may also contribute to the formulation of hypothesis.

Personal life and experience of person determine their perception and conception these may, in term direct a person to certain hypothesis more quickly. The story Newton and falling apple, the flash of wisdom to Sree Buddha under Banyan tree illustrate this accidental process.

5. Findings and Studies

Hypothesis may be developed out of the findings of other studies in order to repeat the test.

6. Culture

Another source of hypothesis is the culture in which the researcher is nurtured For example sociology as an academic discipline originated from western culture Over the past decade a large part of the hypothesis on American society examine by researchers were connected with violence.

Indian society is caste-ridden riddled with inequalities and privileges.

Characteristics of a Good hypothesis

What is a good hypothesis? What are the criteria of for judging it. An acceptable should fulfil certain conditions.

1. Conceptual Clarity

A hypothesis should be conceptually clear. It should consist of clearly defined and understandable concepts

2. Specificity

A hypothesis should be specific and explain the expected relation b/w variables and the conditions under which these relations will hold.

3. Testability

A hypothesis should be testable and should not be a moral judgement. It should be possible to collect empirical evidences to test techniques.

4. Availability of techniques

Hypothesis should be related to available techniques. Otherwise they will not be researchable therefore the research must make sure that methods are available for testing his proposed hypothesis.

5. Consistency

Hypothesis should be logically consistent. The propositions derived should not be contradictory

6. Objectivity

Scientific hypothesis should be free from value judgment. The researcher system of values has no placing Research.

7. Simplicity

A hypothesis should be as simple as possible. Simplicity demands insight. The more in insight the researcher has into a problem, the simpler will be his hypothesis.

Types of Hypothesis

1. Descriptive Hypothesis

These are propositions, they described the characteristics of a variable. The variable may be an object, person, organisation, situation or event. For ex. "The rate of unemployment among arts graduates is higher than that of commerce graduates".

2. Relational Hypothesis

These are propositions which describe the relationship b/w two variables. The relation suggested many be positive or negative for ex. 'Families with higher income spent more for recreation'. 'Upper class people have more children than lower class people'.

3. Causal Hypothesis

Causal Hypothesis states that the existence of, or a change in, one variable causes for leads to an effect on other variable. The 1st variable is called independent variable later the dependent variable.

4. Common Sense Hypothesis

These represent the common sense ideas. They state the existence of empirical uniformities received through day to day observations.

5. Analytical Hypothesis

These are concerned with the relationship of analytic variables. This hypothesis occurs and the higher level of abstraction.

6. Null Hypothesis

Null means 'Zero' when a hypothesis is stated negatively. It is called Null Hypothesis. The object of this hypothesis is to avoid the personal bias of the investigator. In the matter of collection of data, A null hypothesis is used to collect additional support for the known hypothesis.

7. False Hypothesis

A hypothesis which is bound to be unsatisfactory when verified is called a false hypothesis.

8. Barren Hypothesis

A hypothesis from which no consequences can be deducted is called a Barren Hypothesis. It is a hypothesis which cannot to test. Eg:. The child fell ill because a wicked women's eye felt upon it. This is a baseless hypothesis because it cannot be verified.