Notes

on

RESEARCH METHODOLOGY

CHAPTER- 1

INTRODUCTION

1.1 Research:

-A way of examining your practice.

-Research is undertaken within most professions.

-More than a set of skills, it is a way of thinking: examining critically the various aspects of your professional work.

-It is a habit of questioning what you do, and a systematic examination of the observed information to find answers with a view to instituting appropriate changes for a more effective professional service.

1.2 Definition/Meaning of Research

Research in simple terms, refers to a search for knowledge. It is also known as a scientific and systematic search for information on particular topic or issue. It is also known as the art of scientific investigation. Several social scientists have defined research in different ways.

In the Encyclopedia of Social Sciences, D. Slesinger and M. Stephension (1930) defined research as "the manipulation of things, concept or symbols for the purpose of generalizing to extend, correct or verify knowledge, whether that knowledge aids in construction of theory or in practice of an art".

According to Redman and Mory (1923), defined research is a "systematized effort to gain new knowledge". It is an academic activity and therefore the term should be used in a technical sense. According to Clifford Woody (Kothari 1988) research comprises "defining and redefining problems, formulating hypothesis or suggested solutions; collecting, organizing and evaluating data; making deductions and reaching conclusions; and finally, carefully testing the conclusions to determine whether they fit the formulating hypothesis".

Thus, research is an original addition to the available knowledge, which contributes to its further advancement. It is an attempt to pursue truth through the methods of study, observation, comparison and experiment. In sum, research is the search for knowledge, using objective and systematic methods to find solution to a problem.

When you say that you are undertaking a research study to find answers to a question, you are implying that the process;

1. is being undertaken within a framework of a set of philosophies (approaches);
2. uses procedures, methods and techniques that have been tested for their validity and reliability.
3. is designed to be unbiased and objective.

Philosophies means approaches e.g. qualitative, quantitative and the academic discipline in which you have been trained.

Validity means that correct procedures have been applied to find answers to a question. Reliability refers to the quality of a measurement procedure that provides repeatability and accuracy.

Unbiased and objective means that you have taken each step in an unbiased manner and drawn each conclusion to the best of your ability and without introducing your own vested interest.

(Bias is a deliberate attempt to either conceal or highlight something)

Adherence to the three criteria mentioned above enables the process to be called 'Research'.

However, the degree to which these criteria are expected to be fulfilled varies from discipline to discipline and so the meaning of 'research' differs from one academic discipline to another.

The difference between research and non-research activity is, in the way we find answers: the process must meet certain requirements to be called research. We can identify these requirements by examining some definitions of research.

The word research is composed of two syllables, re and search. re is a prefix meaning again, anew or over again search is a verb meaning to examine closely and carefully, to test and try, or to probe. Together they form a noun describing a careful, systematic, patient study and investigation in some field of knowledge, undertaken to establish facts or principles.

Research is a structured enquiry that utilizes acceptable scientific methodology to solve problems and create new knowledge that is generally applicable.

Scientific methods consist of systematic observation, classification and interpretation of data.

Although we engage in such process in our daily life, the difference between our casual day-to-day generalization and the conclusions usually recognized as scientific method lies in the degree of formality, rigorousness, verifiability and general validity of latter.

1.3 Objectives of research

The objective of research is to discover answers to questions by applying scientific procedures. In the other words, the main aim of research is to find out truth which is hidden and has not yet been discovered. Although every research study has its own specific objectives, research objectives may be broadly grouped as follows:

1. to gain familiarity with or new insights into a phenomenon (i.e., formulative research studies);
2. to accurately portray the characteristics of a particular individual, group, or a situation (i.e., descriptive research studies);
3. to analyse the frequency with which something occurs (i.e., diagnostic research studies); and
4. to examine a hypothesis of a causal relationship between two variables (i.e., hypothesis-testing research studies).

1.4 Research methods versus methodology

Research methods include all those techniques/methods that are adopted for conducting research. Thus, research techniques or methods are the methods the researchers adopt for conducting the research operations.

On the other hand, research methodology is the way of systematically solving the research problem. It is a science of studying how research is conducted scientifically. Under it, the researcher acquaints himself/herself with the various steps generally adopted to study a research problem, along with the underlying logic behind them. Hence, it is not only important for the researcher to know the research techniques/methods, but also the scientific approach called methodology.

1.5 Research approaches

There are two main approaches to research, namely quantitative approach and qualitative approach. The quantitative approach involves the collection of quantitative data, which arc put to rigorous quantitative analysis in a formal and rigid manner. This approach further includes experimental, inferential, and simulation approaches to research. Meanwhile, the qualitative approach uses the method of subjective assessment of opinions, behaviour and attitudes. Research in such a situation is a function of the researcher's impressions and insights. The results generated by this type of research is either in non-quantitative form or in the form which can not be put to rigorous quantitative analysis. Usually, this approach uses techniques like depth interviews, focus group interviews, and projective techniques.

1.6 Applied vs. Fundamental Research

Research can also be applied or fundamental research. An attempt to find a solution to an immediate problem encountered by a firm, an industry, a business organisation, or the society is known as applied research. Researchers engaged in such researches aim at drawing certain conclusions confronting a concrete social or business problem. On the other hand, fundamental research mainly concerns generalizations and formulation of a theory. In other words, "Gathering knowledge for knowledge's sake is termed 'pure' or 'basic' research" (Young in Kothari 1988). Researches relating to pure mathematics or concerning some natural phenomenon are instances of fundamental research. Likewise, studies focusing on human behaviour also fall under the category of fundamental research. Thus, while the principal objective of applied research is to find a solution to some pressing practical problem, the objective of basic research is to find information with a broad base of application and add to the already existing organized body of scientific knowledge.

1.7 Importance of knowing how to conduct research

The following are the importance of knowing how to conduct a research:

(i) the knowledge of research methodology provides training to new researchers and enables them to do research properly. It helps them to develop disciplined thinking or a 'bent of mind' to objectively observe the field.
(ii) the knowledge of doing research would inculcate the ability to evaluate and utilise the research findings with confidence;
(iii) the knowledge of research methodology equips the researcher with tools that help him/her to observe things objectively; and
(iv) the knowledge of methodology helps the research consumer to evaluate research and make rational decisions.

1.8 Qualities of a researcher

Sir Michael Foster (Wilkinson and Bhandarkar 1979) identified a few distinctive qualities of a scientist. According to him, a true research scientist should possess the following main three qualities.

(1) First of all, the nature of a researcher must be of the temperament that vibrates in unison with the theme which he is searching. Hence, the seeker of knowledge must be truthful with truthfulness of nature, which is much more important, much more exacting than what is sometimes known as truthfulness. The truthfulness relates to the desire for accuracy of observation and precision of statement.

(2) A researcher must possess an alert mind. The Nature is constantly changing and revealing itself through various ways. A scientific researcher must be keen and watchful to notice such changes, no matter how small or insignificant they may appear. Such receptivity has to be cultivated slowly and patiently over time by the researcher through practice.

(3) Scientific enquiry is pre-eminently an intellectual effort. It requires the moral quality of courage, which reflects the courage of a steadfast endurance. The science of conducting research is not an easy task. There are occasions when a research scientist might feel defeated or completely lost. This is a stage when the researcher would need immense courage and a sense of conviction. The researcher must learn the art of enduring intellectual hardships.

In order to cultivate the afore-mentioned three qualities of a researcher, a fourth one may be added. This is the quality of making statements cautiously. According to Huxley, "The assertion that outstrips the evidence is not only a blunder but a crime" (Thompson 1975). A researcher should cultivate the habit of reserving judgment when the required data are insufficient.

1.9 Significance of research

Research encourages scientific and inductive thinking, besides promoting the development of logical habits of thinking and organisation.

The role of research in applied economics in the context of an economy or business is greatly increasing in modern times. The increasingly complex nature of government and business has raised the use of research in solving operational problems. Research assumes significant role

in the formulation of economic policy, for both the government and business. It provides the basis for almost all government policies of an economic system. Government budget formulation, for example, depends particularly on the analysis of needs and desires of people, and the availability of revenues, which requires research. Research helps to formulate alternative policies, in addition to examining the consequences of these alternatives. Thus, research also facilitates the decision- making of the policy-makers, although in itself it is not a part of research. In the process, research also helps in the proper allocation of a country's scarce resources. Research is also necessary for collecting information on the social and economic structure of an economy to understand the process of change occurring in the country. Collection of statistical information, though not a routine task, involves various research problems. Therefore, large staff of research technicians or experts is engaged by the government these days to undertake this work.

Research also assumes a significant role in solving various operational and planning problems associated with business and industry. In several ways, operations research, market research, and motivational research are vital and their results assist in taking business decisions. Market research is refers to the investigation of the structure and development of a market for the formulation of efficient policies relating to purchases, production and sales. Operational research relates to the application of logical, mathematical, and analytical techniques to find solution to business problems such as cost minimization or profit maximization, or the optimization problems. Motivational research helps to determine why people behave in the manner they do with respect to market characteristics. More specifically, it is concerned with the analyzing the motivations underlying consumer behaviour. All these researches are very useful for business and industry, who are responsible for business decision- making.

Research is equally important to social scientists for analyzing social relationships and seeking explanations to various social problems. It gives intellectual satisfaction of knowing things for the sake of knowledge. It also possess practical utility for the social scientist to gain knowledge so as to be able to do something better or in a more efficient manner. This, research in social sciences is concerned with both knowledge for its own sake, and knowledge for what it can contribute to solve practical problems.

CHAPTER-2

ELEMENTS OF RESEARCH: THE THEORETICAL FRAMEWORK

2.1 Research Process:

- consists of series of actions or steps necessary to carry out the research effectively. The chart shown below illustrates a research process.
- consists of closely related activities, such activities overlap continuously rather than following a strictly prescribed sequence. However, the following order concerning various steps provides a useful procedural guidance regarding the research process.

1. Formulating the research problem
2. extensive literature survey
3. developing the hypothesis
4. preparing the research design
5. determining the sample design
6. collecting the data
7. execution of the project
8. analysis of data
9. hypothesis testing
10. generalizations and interpretations
11. preparation of the report or presentation of the results

1. Formulating the research problems

2 types of research problem

i) those which relate to states of nature, and

ii) those which relate to relationship between variables

The researcher must single out the problem he wants to study, like to enquiry into. The feasibility of a particular solution has to be considered before a working formulation of the problem can be set up. The formulation of a general topic into a specific research problem, thus constitutes the first step in a scientific enquiry.

2 steps:

(i) understanding the research problem

(ii) rephrasing the same into meaningful terms from an analytical point of view.

It is the first and *most crucial step* in the research process

- Main function is to decide *what* you want to find out *about.*
- The way you formulate a problem determines almost every step that follows.

Defining the research of problem:

Research Problem refers to some difficulty which a researcher experiences in context of either a theoretical or practical situation and wants to obtain a solution for the same.

Components of research problem:

(i) There must be an individual or a group which has some difficulty or the problem

(ii) There must be some objective(s) to be attained at

(iii) There must be alternative means or courses of action for obtaining the objectives

(iv) Doubt in researcher's mind with regard to the selection of alternatives.

(v) There must be some context/environment(s) to which the difficulty pertains.

Selecting the problem:

Points to be considered while selecting a research problem.

(i) Subject which is overdone should not be normally chosen

(ii) controversial subjects should not become the choice

(iii) Too narrow or too vague problems should be avoided

(iv) The subject of the research should be familiar and feasible so that the related material or sources of research are within one's reach.

(v) The importance of the subject, qualifications and training of the researcher, the cost involved, time factor must be considered.

Before a final selection of problem, ask himself the following questions:

a) well-equipped in terms of his background to carry out research

b) budget he can afford

c) necessary cooperation he can obtain from participants of the research

d) preliminary study

Necessity of defining the problem:

a problem is half solved if it is clearly stated. Therefore, the problem should be well defined because it

– discriminate relevant data from irrelevant

– enable researcher on track

– helps to determine what data to be collected, what characteristics of data to study, what relations to be explored? Techniques to used for this purpose?

<u>Sources of research problems</u>

Research in social sciences revolves around four Ps:

- People- a group of individuals
- Problems- examine the existence of certain issues or problems relating to their lives; to ascertain attitude of a group of people towards an issue
- Programs- to evaluate the effectiveness of an intervention
- Phenomena- to establish the existence of regularity.

In practice most research studies are based upon at least a combination of two *Ps.* Every research study has two aspects:

i. **Study population-**

- People: individuals, organizations, groups, communities

(*they provide you with the information or you collect information about them)*

ii. Subject area-

- Problems: issues, situations, associations, needs, profiles
- Program: content, structure, outcomes, attributes, satisfactions, consumers Service providers, etc.
- Phenomenon: cause-and-effect relationships, the study of a phenomenon itself

(*Information that you need to collect to find answers to your research questions)*

Considerations in selecting a research problem:

These help to ensure that your study will remain manageable and that you will remain motivated.

1) **Interest**: a research Endeavour is usually time consuming, and involves hard work and possibly unforeseen problems. One should select topic of great interest to sustain the required motivation.
2) **Magnitude:** It is extremely important to select a topic that you can manage within the time and resources at your disposal. Narrow the topic down to something manageable, specific and clear.
3) **Measurement of concepts**: Make sure that you are clear about the indicators and measurement of concepts (if used) in your study.
4) **Level of expertise**: Make sure that you have adequate level of expertise for the task you are proposing since you need to do the work yourself.
5) **Relevance**: Ensure that your study adds to the existing body of knowledge, bridges current gaps and is useful in policy formulation. This will help you to sustain interest in the study.
6) **Availability of data**: Before finalizing the topic, make sure that data are available.
7) **Ethical issues**: How ethical issues can affect the study population and how ethical problems can be overcome should be thoroughly examined at the problem formulating stage.

Steps in formulation of a research problem :

Working through these steps presupposes a reasonable level of knowledge in the broad subject area within which the study is to be undertaken. Without such knowledge it is difficult to clearly and adequately ‘dissect’ a subject area.

Step 1 Identify a broad field or subject area of *interest* to you.

Step 2 *Dissect* the broad area into sub areas.

Step 3 *Select* what is of most interest to you.

Step 4 Raise research questions.

Step 5 Formulate objectives.

Step 6 Assess your objectives.

Step 7 Double check.

So far we have focused on the basis of your study, *the research problem.* But every study in social sciences has a second element, *the study population* from whom the required information to find answers to your research questions is obtained.

As you narrow the research problem, similarly you need to decide very specifically who constitutes your study population, in order to select the appropriate respondents.

Techniques involved in defining a problem:

must be tackled intelligently to avoid the perplexity encountered in a research operation. It involves the following steps:

1) Statement of the problem in a general way
   - First of all the problem should be stated in a broad general way, keeping in view either some practical concern or some scientific or intellectual interest.
   - The researcher must immense himself thoroughly in the subject matter concerning which he wishes to pose a problem
   - In social research, field observation to undertake some sort of preliminary survey or what is called pilot survey.
2) Understanding the nature of the problem
   - to understand its origin and nature clearly
   - best way is to discuss it with who first raised it to find out how the problem originally come about and with what objections in view.
   - If the researcher has stated the problem himself, he should consider once again all those points that induced him to take a general statement concerning the problem.
3) Surveying the available literature
   - All the literature concerning the problem at hand must necessarily be surveyed and examined before a definition of the research problem is given.
4) Developing the ideas through discussions

Discussions concerning a problem produces useful information. Various new ideas can be developed through such an exercise.

A researcher must discuss his problem with his/her colleagues and others who have enough experience in a same area or in working on similar problems.

5) Rephrasing the research problem

Finally, the research must sit to rephrasing the research problem into a working proposition once the nature of the problem has been clearly understood, the environment has been defined, discussions over the problem have taken place and the available literature has been surveyed and examined, rephrasing the problem into analytically or operational terms is not a difficult task.

2. Extensive literature survey

Once the problem is formulated, a brief summary of it should be written down.

– undertake extensive literature survey connected with the problem.

– For this purpose the abstracting and indexing journals and published or unpublished bibliographies are the first place to go.

– Academic journals, conference proceedings, government reports, books etc. must be tapped depending on the nature of the problem.

– In this process, one source will lead to another.

– The earlier studies, if any, similar to the study in hand should be carefully studied.

– Essential preliminary task in order to acquaint yourself with the available *body of knowledge* in your area of interest.

– 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.

a. **Bring clarity and focus to your research problem**;

The process of reviewing the literature helps you to understand the subject area better and thus helps you to conceptualise your research problem clearly and precisely. It also helps you to understand the relationship between your research problem and the body of knowledge in the area.

b. **Improve your methodology**:

A literature review tells you if others have used procedures and methods similar to the ones that you are proposing, which procedures and methods have worked well for them, and what

problems they have faced with them. Thus you will be better positioned to select a methodology that is capable of providing valid answer to your research questions.

c. **Broaden your knowledge base in your research area**:

It ensures you to read widely around the subject area in which you intend to conduct your research study. As you are expected to be an expert in your area of study, it helps fulfill this expectation. It also helps you to understand how the findings of your study fit into the existing body of knowledge.

d. **Contextualize your findings**:

How do answers to your research questions compare with what others have found? What contribution have you been able to make in to the existing body of knowledge? How are your findings different from those of others? For you to be able to answer these questions, you need to go back to your literature review. It is important to place your findings in the context of what is already known in your field of enquiry.

Procedure for reviewing the literature:

(i) search for existing literature in your area of study;
(ii) review the literature selected;
(iii) develop a theoretical framework;
(iv) develop a conceptual framework.

Search for existing literature:

– To effectively search for literature in your field of enquiry, it is imperative that you have in mind at least some idea of broad subject area and of the problem you wish to investigate, in order to set parameters for your search.

– Next compile a bibliography for this broad area. Sources are:

1. books
2. journals

BOOKS

Comprise a central part of any bibliography.

Advantage : - material published generally is of good quality and the findings are integrated with other research to form a coherent body of knowledge.

Disadvantage : - material is not completely up to date, as it can take a few years between the completion of a work and publication in the form of a book.

Search for books in your area of interest, prepare a final list, locate these books in the libraries or borrow from other sources. Examine their content, if contents are not found to be relevant to your topic, delete it from your reading list.

JOURNALS

Journals provide you with the most up-to-date information, even though there is a gap of two to three years between the completion of a research project and the publication in a journal.

As with books, you need to prepare a list of journals for identifying literature relevant to your study. This can be done as follows:

– locate the hard copies of the journal that are appropriate to your study;
– use the internet
– look at the index of research abstracts in the relevant field to identify and read the articles.

Whichever method you choose, first identify the journals you want to look at in more detail for your review of literature. Select the latest issue; examine its content page to see if there is an article of relevance to your research topic. If you feel a particular article is of relevance to you, read its abstract. If you think you are likely to use it, photocopy or prepare a summary and record it for reference for later use.

Review the literature selected:

After identifying books and articles as useful, the next step is to start reading them critically to pull together themes and issues that are associated.

If you do not have a theoretical framework of themes in mind to start with, use separate sheets of paper for each article or book.

Once you develop a rough framework, slot the findings from the material so far reviewed into that framework, using a separate sheet of paper for each theme of that framework.

As you read further, go on slotting the information where it logically belongs under the theme so far developed. You may need to add more themes as you go.

Read critically with particular reference to the following aspects:

- Note whether the knowledge relevant to your theoretical framework is confirmed beyond doubt.
- Note the theories put forward, the criticisms of these and their basis, the methodologies adopted and the criticisms of them.
- Examine to what extent the findings can be generalized to other situations.

Ascertain the areas in which little or nothing is known-the *gaps* that exist in the body of knowledge.

Develop a theoretical framework:

As you have limited time it is important to set parameters by reviewing the literature in relation to some main themes pertinent to your research topic.

As you start reading the literature, you will realize that it deals with a number of aspects that have a direct `and indirect bearing on your research topic. Use these aspects as a basis for developing your theoretical framework.

Until you go through the literature you cannot develop a theoretical framework and until you have developed a theoretical framework, you cannot effectively review the literature.

Literature pertinent to your study may deal with two types of information:

– universal;

– more specific(i.e. local trends or specific program)

In writing about such information you should start with the general information, gradually narrowing down to the specific.

Writing up the literature reviewed:

In order to comply with the first function of literature review

i.e. to provide theoretical background to your study:

– List the main themes that have emerged while reading literature.

– Convert them into subheadings. These subheadings should be precise, descriptive of the theme in question, and follow a logical progression.

– Now, under each subheading, record the main findings with respect to the theme in question, highlighting the reasons for and against an argument if they exist, and identify gaps and issues.

In order to comply with the second function of literature review

i.e. *contextualizing the findings of your study*- requires you to very systematically compare your findings with those made by others. Quote from these studies to show how your findings contradict, confirm or add to them. It places your findings in the context of what others have found out. This function is undertaken *when writing about your findings i.e. after analysis of your data.*

THE BIBLIOGRAPHY

The bibliography should give a clear, complete description of the sources that were used while preparing the report.It is an alphabetical list as per the author's surname.

1. For a Book

Surname of author, name or two initials, Title taken from title page-underlined or in italics, Edition (if more than one), volume if more than one, place of publication, publishers, date on title page or copyright date.

E.g. Kothari, C.R., *Research Methods-Methods and Techniques,* 1989, New Delhi :Wiley Eastern Limited,4835/24 Ansari Road, Daryaganj, New Delhi 110 006.

3. Developing the working hypothesis:

After extensive literature survey, researcher should state in clear terms of the working hypothesis or hypotheses.

– Working Hypothesis is tentative assumption made in order to draw out and test its logical or empirical consequences. As such the manner in which research is carried out is important as they provide the focal point of research.

The role of hypothesis:

– to guide the researchers by delimiting the area of research and to keep him on the right track.

– It sharpens thinking and focuses on the important facts of the problem.

– It also indicates the types of data required and the type of methods of data analysis to be used.

How does one go about developing hypothesis?

(i) Discussions with colleagues and experts about the problem, its origin and the objectives in seeking a solution.

(ii) Examination of data and records, if available.

(iii) Review of similar studies in the area.

(iv) Personal investigation which involves original field interviews.

4. Preparing the research design:

– to state the conceptual structuring with in which research would be conducted.

– facilitates research to be as efficient as possible yielding maximal information.

– provides for the collection of relevant evidence with optimum effort, time and expenditure.

– how all these can be achieved depends on the research purpose.

Research purpose:

i) Exploration ii) Description iii) Diagnosis and iv) Experimentation

5. Determining sample design

– All the items under consideration in any field of inquiry constitute a 'universe' or 'population'.

– Considering 'universe' or 'population' involves great deal of time money and energy

– We select only a few items from the universe for out study purpose. The items so selected constitute what is technically called a sample.

6. Collecting the data:

In dealing with any real life problem, it is often found the data in hand is inadequate and hence, it becomes necessary to collect data and hence, it becomes necessary to collect data that is appropriate. Several ways of collecting data which differs considerably in context of cost, time and other resources. Primary data can be collected either through experiment or survey. If the researcher conducts an experiment, he observes some quantitative measurements, or the data with the help of which he examines the truth contained in his hypothesis.

In case of survey, data can be collected by any of the following ways:

(i) observation

(ii) personal interview

(iii) telephone interview

(iv) mailing questionnaires

(v) through schedules

7. Execution of the project:

- a very important step in the research process.
- structured questionnaires, machine processed
- interviewers, proper selection and training of interviewers
- if some of the respondents do not cooperate, suitable methods should be designed to tackle the problem
- occasional field checks

8. Analysis of data:

Requires a number of closely related operations such as establishment of categories, the application of these categories to raw data through coding, tabulation, then drawing statistical inferences.

9. Hypothesis Testing: facts support hypothesis or they happen to be contrary.

10. Generalizations and interpretation:

If the hypothesis is tested and upheld, several times if many be possible for the researchers to arrive at the generalization. The real value of research is given by its ability to generalize.

11. Preparation of the report

Writing the report is the last, and for many, the most difficult step of the research process. The report informs the world what you have done, what you have discovered and what conclusions you have drawn from your findings. The report should be written in an academic style. Language should be formal and not journalistic.

Lay out of the report

- preliminary pages

title, date, Acknowledgment, toc

- Main text

Introduction, summary of findings, main report, conclusion.

- End matter
  - Appendices
  - Bibliography list of journals, books, reports consulted
  - Index

Characteristics of Research

Research is a process of collecting, analyzing and interpreting information to answer questions. But to qualify as research, the process must have contained characteristics:

1. Controlled
   The concept of control implies that, in exploring causality in relation to two variables(factors), study is set up in a way that minimizes the effects of other factors affecting the relationship.
2. Rigorous:
   You must be careful in ensuring that the procedures followed to find answers to questions are relevant, appropriate and justified. Again, the degree of rigor varies markedly between the physical and social sciences and within the social sciences.
3. Systematic:
   This implies that the procedure adopted to undertake an investigation follow a certain logical sequence. The different steps can not be taken in a haphazard way. Some procedure must follow others.
4. Valid and Verifiable:
   It implies that whatever you conclude on the basis of your findings is correct and can be verified by you and others.
5. Empirical:
   Any conclusion drawn are based upon hard evidence gathered from information collected from real life experience or observations.
6. Critical:
   Critical scrutiny of the procedures used and the methods employed is crucial to a research enquiry. This process of investigation must be full proof and free from drawbacks. The process adopted and the procedures used must be able to withstand critical scrutiny.

CHAPTER-3
ELEMENTS OF RESEARCH: THE THEORETICAL FRAMEWORK

Measurement

is defined as a process of associating numbers or symbols to observations obtained in a research study. These observations could be qualitative or quantitative. For example, mean, standard deviation, etc. can be computed for quantitative characteristics.

- Qualitative characteristics can be counted and cannot be computed.
- Therefore, the researcher must have a clear understanding of the type of characteristic or variable before collecting data.
- The observations on qualitative variables may also be assigned numbers.
  Marital status Yes/No -- 0 and 1 (or 1 and 2)

Goodness of Measurement Scale:

1. Validity : utility, degree to which an instrument measures what if it is supposed to measure.
2. Reliability : consistent results
3. Practicality : economy, convenience, interpretability
4. Accuracy : true representation of the observation of underlying characteristic.

Nature of Measurement

A scale is a tool or mechanism by which individuals are distinguished on the variables of interest to our study, in some form or other. The scale or tool could be a gross one in the sense that it would only broadly categorize individuals on certain variables or it could be fine tuned tool that would differentiate individuals on the variables with varying degrees of sophistication.

Types of Scales:

The nominal or classificatory scale:

A nominal scale enables the classification of individuals, objects or responses into subgroups based on a common/shared property or characteristic.

A variable measured on a nominal scale may have one, two or more subcategories depending upon the extent of variation.

For example, '*water*' or '*tree*' have only one subgroup, whereas the variable "*gender*" can be classified into two sub-categories: *male and female.* '*Hotels*' can be classified into ---- sub-categories.

The sequence in which subgroups are listed makes no difference as there is no relationship among subgroups.

The ordinal or ranking scale:

Besides categorizing individuals, objects, responses or a property into subgroups on the basis of common characteristic, it ranks the subgroups in a certain order.

They are arranged either in ascending or descending order according to the extent a subcategory reflects the magnitude of variation in the variable.

For example, 'income' can be measured either quantitatively (in rupees and paisa) or qualitatively using subcategories 'above average', 'average' and 'below average'. *The 'distance' between these subcategories are not equal as there is no quantitative unit of measurement.*

'Socioeconomic status' and 'attitude' are other variables that can be measured on ordinal scale.

The interval scale:

An interval scale has all the characteristics of an ordinal scale. In addition, it uses a unit of measurement with an arbitrary starting and terminating points.

For example,

Celsius scale: 0^0C to 100^0C

Fahrenheit scale: 32^0F to 212^0F

Attitudinal scales: 10-20

21-30

31-40 etc

The ratio scale:

A ratio scale has all the properties of nominal, ordinal and interval scales plus its own property: *the zero point of a ratio scale is fixed, which means it has a fixed starting point.* Since the difference between intervals is always measured from a zero point, this scale can be used for mathematical operations.

The measurement of variables like income, age, height and weight are examples of this scale. A person who is 40 year old is *twice* as old as one who is 20 year old.

Variables

Variables are an integrated part of any research design. The overall quality of research depends not only upon the appropriateness of the research design and sampling techniques used but also on the measurement procedures followed. The variables need to be defined and measured. The variables used in research have no meaning if they are not measured properly.

- Without Proper measurement of variables, hypothesis can not be tested and the answers to research issues cannot be found.
- Variables should capture something about the concept. For example, Social status is a concept. It needs to be translated into specific dimensions or variables. For most, it means an interrelated set

of factors including people's income, their job, their occupation, their educational level and other aspects of their life style. These dimensions of the concept (social status) are variables.

- Variables are thus the characteristics of persons, things, events, groups, objects, ideas, feelings or any other type of category you are trying to measure.
- A variable is a symbol to which numerals or values are assigned. In other words, a variable can take on many values. For example, age is a variable. Other examples of variables are: Productivity, job satisfaction, absenteeism, length of service, employee attitude etc.
- A variable is thus defined as anything that can take on differing or varying values.
- For example: The productivity of employees differs ranging from very low to very high and hence is a variable.
- The age differs from employee to employee. Therefore, the age of employees takes on a different values ranging from 20-60 and hence is a variable.
- An image, perception or concept that can be measured – *hence capable of taking on different values*- is called a *variable.*

The measurement of a variable involves the identification of its attributes. An attribute is a specific element or value on a variable. For instance, the variable gender has 2 attributes: Male/ Female.

Similarly, variable satisfaction might be defined as having five attributes as follows:

1. Very satisfied
2. Satisfied
3. Neutral
4. Dissatisfied
5. Very dissatisfied

These attributes are, however, not always mutually exclusive.

A person who is underemployed and looking for a job would be able to check both attributes: employed and unemployed.

Types of Variables:

1) The dependent variable

   If its values depends upon the other variables. The investigator's purpose is to study, analyze and predict the variability in the dependent variable.

   What would be the result in the dependent variable if certain changes appear in other related variables?

   Hence, the variable that is used to describe or measure the problem under study is called the dependent variable.

   For example:

   The Production Manager is concerned about employee's productivity (low, medium or high) so its variable.

2) Independent variable

   If it is not influenced by any other variable under study. It however influences the dependent variable.

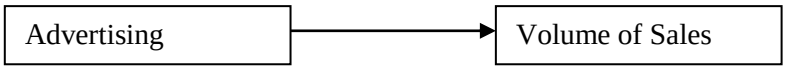
   Any change in dependent variable is due to the change in independent variable.

Variables are often symbolized by letter of the alphabet such as X, Y or Z. These letters of alphabet then symbolize a particular value for a particular variable.
If measuring the average income of the Campus teachers (variable X), you would be collecting information about the income variable. Value could range between Rs. 20,000 a month to Rs. 50,000 a month. For a variable, two things are considered
One is the type of variable.
Other is the value or numbers for that variable.
In the above example: the type of variable is income and the value is expressed in rupees.
When the values of all these variables are expressed in numbers, we call them numerical variables. Numerical variables can be continuous or discrete. Continuous numerical variables are those, which can be expressed as fractions or in decimals.
Discrete numerical variables are those which can take values as whole numbers.

Variables can also be quantitative or qualitative. Quantitative variables are sometimes called categorical variables. For example, may be interested in the age, their average spending and length of stay. Each characteristic is a quantitative variable because the data that each generates is numerical.
34 years, Rs. 15000, stays for 7 days.

Quantitative variables thus generates quantitative data. These variables are measured on an ordinal, interval or ratio scales.

Qualitative Variables generate no numerical or qualitative data. For instance: "Nationality of a college student" is a qualitative variable because nationality can be classified as India, China, Nepal. Qualitative variables are measured on a nominal scale. For example:



Independent Variable Dependent Variable

Annual Earning (Independent Variable) –> Annual Saving (Dependent Variable)

3) **Moderating variable:** Sometimes, another independent variable may exert significant contingent (chance, accidental, possible, occurring or existing only if certain circumstances are the case) effect on the relationship between dependent and independent variable relationship. Thus a moderating variable appeared in the scene.
A moderating variable is defined as one that has a strong contingent effect on the dependent-independent variable relationship. It is a second independent variable because it is believed to have a significant effect on the originally expected relationship. For example:

Training (Independent Variable) > Productivity (Dependent Variable)

Age<50
(Moderating variable)

4) Intervening Variable

There are many social problems where one major variable of interest may depend upon the independent variables, providing the third variable does not come into picture. The presence of third variable (intervening) influences the originally expected relationship between independent and dependent variables.

- influences the nature and degree of relationship between independent and dependent variable.

  For example:

  Challenging Jobs ----------> Motivation ------>Job Performance
  (Independent Variable) (Intervening variable) (Dependent Variable)

The difference between a concept and a variable:

Concepts are mental images or perceptions and therefore their meaning varies markedly from individual to individual.

A concept cannot be measured whereas a variable can be subjected to measurement by crude/refined or subjective/objective units of measurement.

It is therefore important for the concept to be converted into variables.

CONCEPT	VARIABLE
– Subjective impression – No uniformity as to its understanding among different people – As such cannot be measured	– Measurable though the degree of precision varies from scale to scale and variable to variable.

Example(CONCEPT)	Example(VARIABLE)
➢ Excellent ➢ High achiever ➢ Rich ➢ Satisfaction ➢ Domestic violence	– gender (male/ female) – age (x years y months) – weight (__kg) – height (__cms) – religion (Catholic, Hindu) – Income (Rs __ per year)

Concepts, *indicators* and variables:

If you are using a concept in your study, you need to consider its operationalisation- that is, how it will be measured.

For this, you need to identify *indicators- a set of criteria reflective of the concept* which can then be converted into variables.

The choice of indicators for a concept might vary with researchers, but those selected must have a logical link with the concept.

*Concepts*_____>*Indicators*_____>*Variables*

Concepts	*Indicators*	*Variables*	*Working definition*
Rich	*1. Income* *2. Assets*	*1. Income* *2. Total value of home, car, investments.*	1. If>Rs 100000 *2.* If>Rs 250000
Effectivness	*1. No. of guests* *2. Changes in Ratings* *a) extent of* *b) pattern of*	1. No. of guests served in Month/ year 2. No. of excellent per 100 feedback	Difference in before and after levels -do-

Hypothesis:

Hypo : Under or below

Thesis: reasoned theory of rational view point

- Accordingly, hypothesis would mean a theory, which is not fully reasoned
- It is a theory entertained in order to study the facts and examine the validity of the theory
- According to George Alond Berg

"A hypothesis is tentative generalizations the validity of which remains to be tested"

In its most elementary stage, the hypothesis may be any guess, imaginative idea which becomes the basis for an action or investigation.

- A hypothesis is not same as theory

William H. George : theory is elaborated hypothesis. The hypothesis actually emerges from the theory. Thus, theory in its early form is only a hypothesis and they are inter-dependable upon each other.

- In science, hypothesis generally refers to a definite interpretation of a given set of facts which is put forth as a tentative suggestion and remain partly or wholly undefined. Once it is established, it ceases to be a hypothesis and becomes a theory or explanatory principle or law.
- It is a predictive statement capable of being tested by scientific methods that relates an independent variable to some dependent variable.

Example:

a) "Students who receive counseling will show a greater increase in creativity than students not receiving counseling.

b) The automobile A is performing as well as automobile B.

Hypothesis is thus a statement about the relationship between two or more variables which needs to be investigated for its truth. It is basically a working assumption. If the relationship between two variables is found as the hypothesis predicts, then the hypothesis is supported and a new theory has been suggested.

A good hypothesis states as clearly as possible the expected relationship(or difference) between two variables and defines these variables in operation and measurable terms.

These hypotheses are capable of being tested and verified objectively. Thus hypothesis is a tentative generalization, the validity of which has to be tested.

A hypothesis, as its initial stage, may be an imagined idea or mere guess. It is bases on accumulated previous knowledge. It is made in order to find out the correct explanation of a phenomenon through investigation. Based on the hypothesis, facts are observed and collected when by verification, the hypothesis is found true, a theory is obtained.

There are two criteria for good hypothesis statements, i.e., statements about the relations between variables and statement carrying clear implication for testing of stated relations.

Hypothesis Formulation:

Hypothesis can be derived in a variety of ways. You could, for example, observe social situation and come to a conclusion about some of the variables which are operating within it. You could then develop some hypothesis which connects two or more of these variables. Alternatively, you might take an existing theory which has been developed by someone else, and use that to produce further hypotheses.

There are thus two grounds on which a hypothesis may be justified: logical and empirical.

Logical justification is developed from arguments based on concepts and theories relating directly to the search problem.

Empirical justification is based on reference to other research found in the literature.

Hence, to formulate a good/ useful hypothesis, good knowledge of the background to the subject and the nature of the problem/ issue which is being addressed .

A hypothesis statement is derived directly from the statement of the problem. Hypothesis can be stated rather early once the research problem is known. The hypothesis is thus more operational than the problem statement.

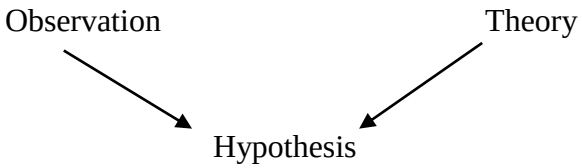


Fig. Process of Hypothesis Formulation

Function of hypothesis

- to adequately explains all the facts connected with the hypothesis.
- It enables us to direct enquiry along the right lines. It suggests experiments and observations. It also helps to collect necessary evidence in order to discover the order of nature.
- It determines the method of verification as well as the procedure for enquiry. It limits the scope of the procedure for enquiry. It limits the scope of enquiry to a manageable area, because, instead of random collection of data, it enables us to search only for relevant facts. Therefore, it leads to economy of time and money.
- It leads to discovery of laws. It explains facts and laws and they seek to verify knowledge.
- It leads to conclusion which is very significant for the advancement of knowledge. The significance of an object or event can be determined by a hypothesis.

Conditions for a valid hypothesis(Qualities of a workable hypothesis)

1. The most important condition for a valid hypothesis is that it should be empirically verifiable. A hypothesis should be compared with the facts of experience directly or indirectly. A hypothesis ultimately has to be confirmed or refused otherwise it will remain a mere supposition, i.e. it must be capable of being empirically tested under the conditions of available techniques of testing.
2. A hypothesis must provide answer to the problem, which initiated enquiry. A false hypothesis is not always useless. It may encourage further investigation and attempt to find out relations among facts and thereby, may increase the evidence for other theories.
3. If more than one hypothesis are available, we should prefer the one which has a strong power of predictability and which explain the consequences.
4. If there are two hypothesis on the same problem and if they can be equally confirmed by evidence, the simpler hypothesis is generally chosen.
   Simpler means

- more general in nature
- fewer assumptions
- smaller number of independent elements.

5. It must be clear, definite and certain.
6. A valid hypothesis generally does not go against the traditionally established knowledge. It may not be invalid in such case as traditional knowledge may be wrong itself.
7. A valid hypothesis suggests an explanation which appears reasonably true in the present state of knowledge.

Research Problem (Questions)

The problem asks about the relation between several facts or observations. Accordingly, the hypothesis suggests that the relationship exists. It is important to realize that the hypothesis has to be stated to realize that the hypothesis has to be stated in a very specific terms so that means of

investigating the hypothesis are included in the statement. A problem is formulated in the form of a question; it serves as the basis or the origin from which a hypothesis is derived.

A hypothesis is a suggested solution to a problem. A problem (question) cannot be directly tested, whereas a hypothesis can be tested and verified. Hence, a problem cannot be scientifically solved unless it is reduced to hypothesis form.

Example:

Research Problem

What is the relationship between literacy rate in Kathmandu before and after the democracy?

Research Hypothesis

There is significant difference in the literacy rate in Kathmandu between when democracy was first established and ten years later.

Types of hypothesis:

i) The Crude and the Refined hypothesis

Crude hypothesis

Very low order of abstraction and largely perhaps even only indicates the kind of data to be gathered and does not very often lead to any higher theoretical research in the nature of a law or a theory. The descriptive method of research is very largely of this type.

Refined hypothesis

More significant in research the degree of significance depending on the level of abstraction underlying the hypothesis.

ii) Descriptive and Relational Hypothesis:

Descriptive Hypothesis are in the form of propositional that only state the existence, size, form or distribution of some variable (Cooper & Schindler, 2008). For example:

P.U. (case) is experiencing budget difficulties (variable).

The KTM-Dhulikhel sector of Araniko Highway (case) has higher-than-average accident rates(variable).

These descriptive statements contain only one variable.

Hence, the relationship between variable can not be studied or explored. These statements do not fulfill the criteria of research hypotheses. It is therefore, advisable to use research questions for the above those statements could be stated as follows:

E.G.

What is the extent of budge difficulties in P.U?

Why is the accident rate higher in KTM-Dhulikhel sector of the Araniko highway?

A relational hypothesis, on the other hand, describes the relationship between two or more variables w.r.t some case.. Relational hypotheses are of two types:

Correlational Hypothesis:
When a statement describes the relationship between two variables. It states, that the variables occur together in some specified manner without stating that one causes the other. The following are the example of correlational hypothesis: Example:
Families with higher income spend more for education/ recreation.

Explanatory Hypothesis:
In an explanatory hypothesis, the implications of one variable on the other are stated. How one variable would cause or lead to a charge in the other variable? Such casual relations can be unidirectional, in which variable A influences B, but not vice-verse. or bidirectional in which each variable influences the other.For example:
The increase in age would lead to decrease in organizational commitment.
The productivity of skilled workers will increase if the workers are given added pay for production in access of the standard.

iii) Directional and Non-directional hypotheses:
The directional hypothesis indicates the particular direction of the expected relationship between two variables. These relationships could be stated in positive or negative form. In stating the relationship between the two variables, the firms such as "positive", "negative", "more than", "less than" and the like are used. The directional hypothesis requires a one-tailed test. The following are the examples of directional hypotheses. For example:
Younger workers are less motivated than older workers.
The greater the workload, the lower the job satisfaction of the workers.

The non-directional hypotheses are formulated when there are no clues available about the positive or negative relationship between two variables.
-do not indicate any direction of the relationship or difference and require a two-tailed test.
-are formulated in cases where previous studies do not exist or indicate conflicting findings.
For example:
There is difference between work attitudes of industrial and agricultural workers.
There is no relationship between educated and uneducated employees in their occupational commitments.

iv) Null and Alternative Hypotheses:
There are two methods of stating the hypothesis.

- A null hypothesis is a statistical hypothesis that is tested for possible rejection under the assumption that it is true.
- The hypothesis contrary to null hypothesis is known as alternative hypothesis.

- In other words, a null hypothesis is a hypothesis set up to be nullified or refuted in order to support an alternative hypothesis.
- The null hypothesis is called null because it usually reflects the "no-difference" or "no-effect" situation. This hypothesis is thus the one actually tested statistically.
- It is an arbitrary convention hypothesizing that any relation or difference in the findings is due to chance or sampling error and puts this supposition to a probability test. Theoretically it is a hypothesis set up for possible rejection. Example:

  The productivity of skilled workers will increase if they are given added pay for production in access of the standard.

  - This is a positive statement whose validity you would attempt to fest through your research.

  The null hypothesis takes the form of a statement indicating no prejudice toward an answer.

  Example:

  No significant difference will exist between productivity of skilled worker on an incentives plan and productivity of skilled workers on a regular wage plan.

  Ho : There is no difference between male and female statistically in their productivity.

  Statistically expressed

  Ho : u1=u2

  Ho : Null hypothesis

  u1 : productivity of male workers

  u2 : productivity of female workers

  The alternate form of the above null hypothesis can be formulated as follows:

  HA : Male workers will have more productivity than female workers, or female workers will have less productivity than male workers.

  Statistically expressed:

  HA : u1>u2

  HA : alternate hypothesis

  u1 : the productivity of male workers

  u2 : the productivity of female workers

  It is clear that an alternative hypothesis which is the opposite of the null is a statement expressing a relationship between two variables or indicating differences between groups.

Null Hypothesis thus indicates a definitive, exact relationship between two variables. i.e. it states that the population correlation between two variables is equal to zero, or that the difference in the means of 2 groups in the population is equal to zero.

TESTING OF HYPOTHESIS

It means subjecting it to some sort of empirical scrutiny to determine if it is supported or refuted by what the researcher observes. Two pre-requisites to test the hypothesis:

i) a real social situation is needed that will suffice as a reasonable testing ground.
ii) the investigation should make sure that the hypothesis is testable.

Two important means of testing hypothesis:

i) the study of hypothesis for logical consistency
ii) the study of hypothesis for agreement with the fact.

i) It consists of checking the logical character of the reasoning by which the consequences of hypothesis are deduced for verification.
In the second place, it involves checking it for agreement with that already known laws of nature. It must not conflict with the highest and simplest laws of good thinking / principles of science which are considered valid.
The suggested inferences are tested in thoughts for logical coherence, before they are tested in action.

ii) In it, one argues that of the hypothesis is true certain facts, condition or relationships will be found, that one looks to see if those conditions are present.
After testing the hypothesis by applying it to already known facts, it may have to be tested by a new appeal to experience. In this new appeal, the data are collected, recorded and manipulated according to the convenience of the science. If the data available are adequate, no appeal to new experience will be necessary.

CHAPTER-4
THE ELEMENTS OF RESEARCH: RESEARCH DESIGN

Particular research area has been identified --> Research Problem defined ---> the related literature in the area have be reviwed

-------> What is Next?

Answer is: To construct the research design

- Choosing an appropriate research design is crucially important to the success of the research project.
- It determines the quality of research results
- A faulty research design may result in misleading findings.

Research Design- Definition

Fred Kerlinger (1986)

Research Design is the plan, structure, strategy of investigation conceived so as to obtain answers to research question. The plan is the overall scheme or program of research. It includes an outline of what the investigator will do from writing the hypothesis and their operational implications to the final analysis of data.

J.W Creswell (2002) :

Research design is a plan for collecting and analyzing evidence that will make it possible for the investigator to answer whatever questions he or she has posed. The design of an investigator touches almost all aspects of research from the minute details of data collection to the selection of the techniques of data analysis.

William Zikmund (2009)

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

Essentials of a good research design

- A research design is an overall plan for the activities to be undertaken during the course of a research study.
- The research design serves as a framework for the study, guiding the collection and analysis of the data, the research instruments to be used and the sampling plan to be followed.
- It is an organized and integrated system that guides the researcher in formulating, implementing and controlling the study.

- The research design is a blueprint specifying the method to be adopted for gathering and analyzing data.
- The research design is a strategy of obtaining information for the purpose of conducting a study and making generalizations about the population.

In planning a research investigation, choices have to made:

- research strategy (experimental vs. Non experimental)
- research setting (Laboratory vs. Natural setting)
- Data Analysis strategies (descriptive vs. inferential statistics)

Elements of a Research Design:

Basic Elements of Research Design are:

i) The problem
ii) Methodology
iii) Data gathering
iv) Data Analysis, and
v) Report writing

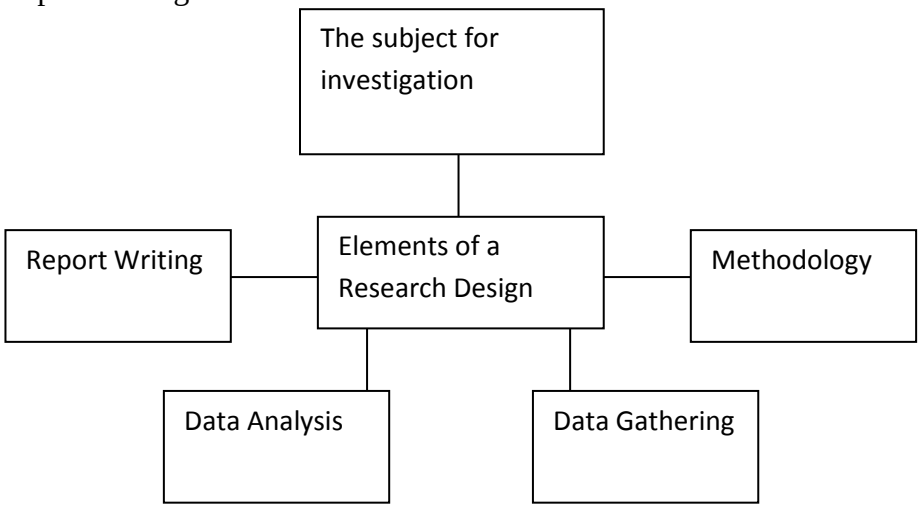


Fig: Elements of research Design.

A good research design considers all the elements as shown in the figure above.

- The first element of a research design is to answer the research question or test research hypothesis.
- Every research work usually requires an explanation of the methodology and the sample description what methods were used to choose the sample? Why these methods are chosen and how they are applied?
  What were the variables in the hypothesis and how they were measured?

- Details of data collection must be explained and a discussion on the reliability and validity of the measurements included.
- It is necessary to explain how the data were analyzed?

Types of Research Design

With a view to giving more detailed information about research designs, research designs are classified into five categories.

1) Exploratory research design
2) Descriptive research design
    - Historical research design
    - Descriptive research design
    - Developmental research design
    - Survey research design
    - Case study research design
3) Comparative research design
    - Correlational research
    - Causal-comparative research
4) Interventional research design
    - Lab-based experimental research
    - Field-based
5) Qualitative research design

- Each Research Design includes several categories of research.
- These research studies have special purposes and features.
- Research designs become more and more complex as you move on from simple exploration to descriptive and further on to explanation and experimentation.

1) Explanatory Research Design

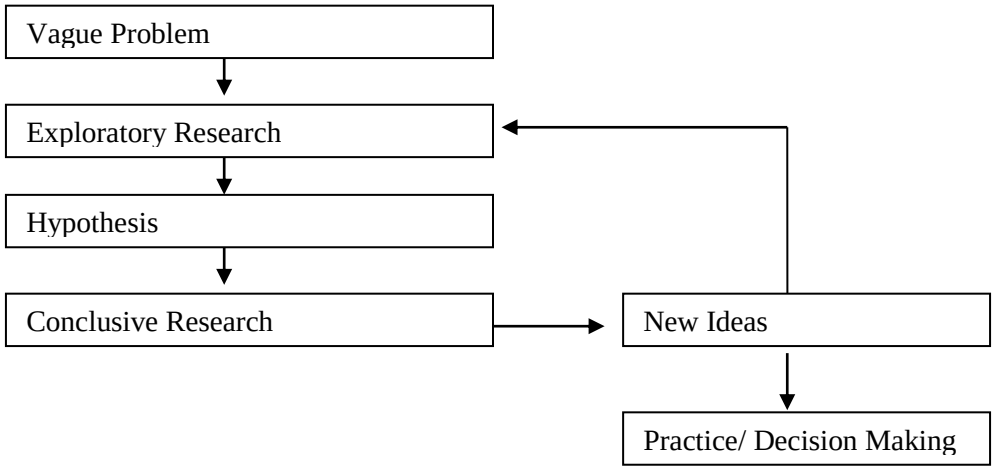


Fig. Types of Research Activities in a sequence.

The relationship and sequence of research activities are shown in fig. When searching for hypothesis, exploratory designs are appropriate.

When hypothesis have been established and are to be tested, conclusive research designs are needed (Boyd Westfall & Stasch 2002). Fig. highlights the sequence of research activities, from vague problem to new idea generation.

An exploratory research is defined as "a study under taken in areas where very little prior knowledge or information is available on the subject under investigation."

- It is thus the initial research conducted to study and define the nature of the problem.
- It is undertaken when we do not know much about the situation at hand.
- In such cases, extensive preliminary work needs to be done to gain familiarity with the phenomenon in the situation.

Three purposes of exploratory research:

- Diagnosing a situation
- Screening alternatives
- Discovering new ideas

First stage of any research project, which is new and unexplored. When knowledge is scant and a deeper understanding is needed, the study becomes exploratory.

2) Descriptive Research Designs

- Descriptive research describes phenomena as they exist.
- Such studies involve the systematic collection and presentation of data to give a clear picture of a particular situation.
- These studies attempt to obtain a complete and accurate description of a situation. These studies can be classified in the following five categories.

Five types of descriptive research designs are not mutually exclusive. A combination of all these could be used in some research projects.

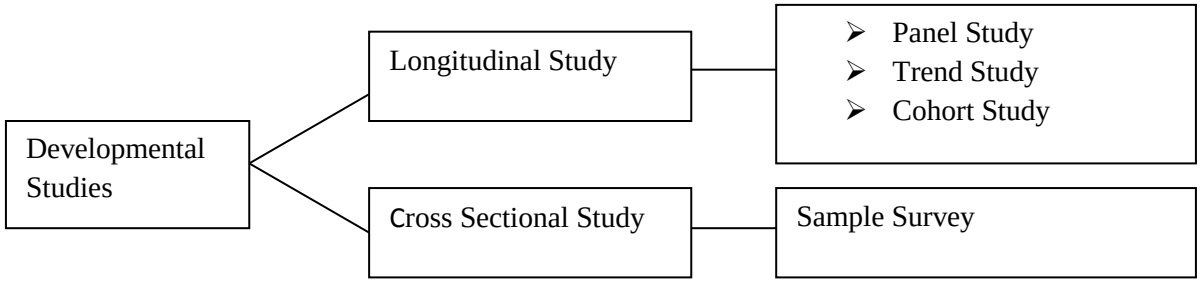
a) Historical Research

- concerned with past phenomena
- it can be defined as " the systematic and objective location, evaluation, and synthesis of evidence in order to establish facts and draw conclusions about past events.
- Thus a process of collecting, evaluating, verifying and synthesizing past evidence systematically and objectively to reach a conclusion.
  - Accuracy of gathered information determines its success.
  - Its uniqueness is that source of data being studied are usually not available for your direct scrutiny. The data used are seldom based on direct observation or experimentation.

b) Descriptive Research
   - It is a fact finding operation searching for adequate information.
   - It is a type of study which is generally conducted to assess the opinions, behaviors or characteristics of a given population and to describe the situation and events occurring at present.
   - It is a process of accumulating facts.
   - It does not necessarily seek to explain relationships, test hypotheses, make prediction or get at meanings and implications of a study.
   - Hence, it is an extensive form of an exploratory research
   - It can include multiple variables for analysis or it might simply report the percentage summary on a single variable.

c) Developmental Research
   - It is conducted for the purpose of predicting future trends.
   - It concentrates on the study of variables, their rates of change, directions, sequences and other inter-related factors over a period of time.

Forms of Developmental Research:



Longitudinal Study

It is a research where phenomena are studied over time either continuously or repeatedly. It measures the nature and rate of change in a sample at different stages of development because data are gathered at two different points in time it is a study carried longitudinally across a period of time. This occurs when the data are collected at two different points of time.

i) Trend Study

- It is probably the most common longitudinal study among others.
- when data are collected at intervals spread over a period of time, it is called trend study.
- It samples different groups of people at different points in time from the same population.
- It is designed to establish patterns of change in the past in order to predict future patterns or conditions.

ii) Cohort Study:

A cohort is a group of people who share a common characteristic or experience within a defined period. Thus cohort study is a study of a specific group such as those born on a day or in the particular period, let in the year 2000.

iii) Panel Study:

A Panel is a group of individuals who have agreed to provide information to a researcher over a period time. In Panel study, we take the same people and study their attitudes towards a particular phenomenon over time.

- are most useful when studying change.

Cross-sectional study

- also known as cross-sectional analysis.
- it involves observation of some items of the population all at the same time.
- it basically measures the rate of change by drawing samples from cross-section of society.
- it focuses on comparing and describing groups.
- such studies are also known as one shot-studies.
- often employ survey strategy.
- A cross-sectional study takes place at a single point of time and that a longitudinal study involves a series of measurements taken over a period of time.

Case study Research

- is an important approach to study the topics is social science and management.
- case studies are written summaries or synthesis of real life cases based upon data and research.
- it is thus defined as "a strategy for doing research which involves an empirical investigation of a particular contemporary phenomenon within a real-life context using multiple sources of evidence.

Rather than using samples to examine a limited number of variables, case study methods involve in-depth longitudinal examination of a single instance or event (case).

This study phenomenon could be a person, a family, a social group, an institution, a community or even an entire culture.

Case studies need to be both comprehensive and systematic. i.e. as much data as possible need to be collected in way that ensures as little as possible is missed.

Limitations of case study

1) expensive as exploratory in nature

2) a generalizations drawn from a single case cannot be applied to all cases in a given population.
3) there is some element of subjectivity.

3) **Comparative Research Designs:**

- A comparative study attempts to establish causes for certain problem. This is done by comparing two or more groups of situations or variables.
- comparative research methods (causal-comparative, experimental and quasi-experimental) are frequently studied together because they all try to show cause and effect relationships among two or more variables.
- to conduct cause and effect research, one variable is considered the cause (independent variable) and the other is considered the effect (dependent variable).

i) Correlational Research:

- It is used to obtain descriptions of phenomena, this technique is used to ascertain the extent to which two variables are related.
- In it, changes in one variable accompany changes in another but the proper tests have not been conducted to show that either variable actually influences the other. Thus, all that is known is that a relationship between them exists.
- When changes in one variable tend to be accompanied by specific changes in another, two variables are said to covary.
- In Correlational Research, the researcher's main interest is to determine whether two or more variables covary, and if so, to establish the direction, magnitude and form of the observed relationships.
- For example,
  Cigarette Smoking and Lung diseases were found to co-vary together from early research.

Types of correlations:

a) Positive correlation
   It exists when an increase in one variable is accompanied by an increase in another e.g. increase in benefits to employees increases productivity.
b) Negative correlation
   It exists when two variables are inversely related. An increase in one variable would result in a decrease in another. For example:
   Increase in absence rate of employees could result in decrease in another.
   e.g, in absence rate of employees could result in decrease in production.
c) No correlation
   It exists when no discriminable correspondence prevails between high and low ranks.

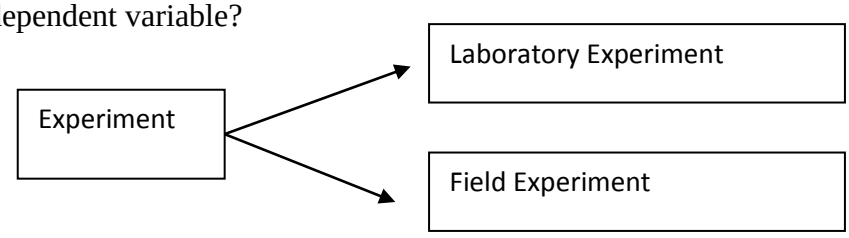
The correlation technique is thus a valuable research tool. This indicates how strongly pairs of variables are related.

ii) Causal-Comparative Research

- Studies that establish causal relationship between variables may be termed explanatory studies. This research investigates the possible causes affecting a particular situation by observing existing consequences and searching for the possible factors leading to these results.
- This research is also known as "ex post facto" (latin for "after the fact") research.
  Kerlinger (1986) defined ex post facto research as, Ex post facto research is that research in which the independent variable or variables have already occurred and in which the researcher starts with the observation of a dependent variable or variables.
  S/he then studies the independent variables in retrospect for their possible relations to effect on dependent variable(s) effect on reasons, causes of existing conditions.
- It involves typically two groups and one independent variable. The researcher selects two groups referred to as comparison groups. The purpose is to determine the cause or reason for existing differences in the status of study groups. 3 important causal-comparative research:
  - There is a control or comparison group
  - There is an intact group
  - The treatment is not manipulated it has already occurred.
- It is non experimental research. The independent variable is not manipulated and subjects are randomly assigned to treatment.

4) Experimental Research

- It is defined as " a situation in which researcher objectively observes phenomenon which is made to occur in a strictly controlled situation where one or more variables are valid and others are kept constant.
- Hence, an experiment is a test of a causal proposition.
  Do the changes in variable A cause systematic changes in variable B? How a change in the value of one variable-called the independent variable affects one another variable-called dependent variable?



Experiment

Scientific investigation in which an investigator manipulates and controls one or more independent and observes the dependent variables for variation concomitant to the manipulation of the independent variable.

Laboratory Experiment:

Research investigation in which investigator created a situation with exact conditions so as to control some and manipulate other variables.

Field Experiment:

Research study in a realistic situation in which one or more independent variables are manipulated by the experimenter under as carefully controlled conditions as the situation will permit.

Characteristics of true experiment study design:

1) Experimental or treatment group: group that receives the experimental treatment, manipulation or is different from the control on the variable under study.
2) Manipulation: The researcher does something to one group of subjects in the study.
3) Control Group: This group is to produce comparison. The researcher introduces one or more control group(s) to compare with the experimental group.
4) Randomization: The researcher takes care to randomly assign subjects to the control and experimental groups.
5) Double blind : Neither the subject nor the experimenter knows the subject is in the treatment or the control condition.

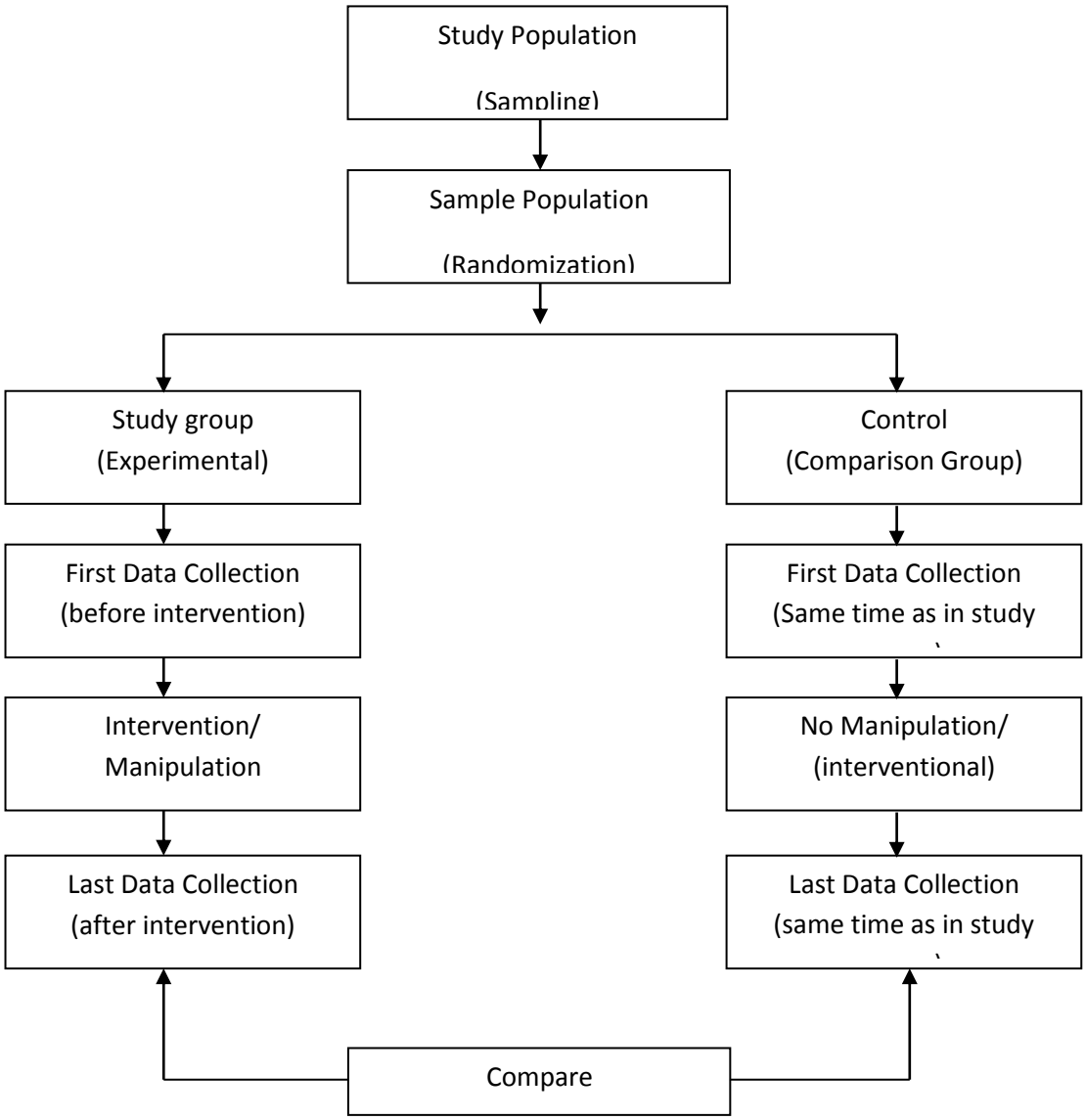


Fig. Diagram of Experimental Study

5) Qualitative Research Design:

J.W. Creswell (2002)

"Qualitative research is an inquiry process of understanding based on distinct methodological traditions of inquiry that explore a social or human problem."

J.A. Maxwell (2005)

"It is a multi-method in focus involving an interpretive, naturalistic approach to its subject matter."

G. Gibbs (2007):

It is an investigation in which the researcher attempts to understand some larger reality by isolating and measuring components of that reality within their contextual setting."

- It is thus an approach to gathering and analyzing information using informal and formal techniques of data collection and analysis.
- It involves the exploration and interpretations of the perceptions, opinions, aspirations, behaviors, concerns, motivation, culture or life styles of small samples of individuals.
- It is highly focused, exploring in depth, the attitudes of people.
- Hence, it is all about exploring issues, understanding phenomenon and answering questions.
- It is thus valuable in providing rich descriptions of complex phenomena; tracking unique or unexpected events.

CHAPTER-5

DESCRIPTION OF RESEARCH

Types of Research

Research can be classified from three perspectives:

1. application of research study
2. objectives in undertaking the research
3. inquiry mode employed

1). From the point of view of application, there are two broad categories of research:

-pure research and

applied research

Pure research involves developing and testing theories and hypotheses that are intellectually challenge to the researcher but may or may not have practical application at the present time or in the future .the knowledge produced through pure research is sought in order to add to the existing body of research methods.

Applied research is done to solve specific, practical question ; for policy formulation, administration and understanding of a phenomenon. It can be exploratory, but is usually descriptive. It is almost always done on the basis of basic research. Applied research can be carried out by academic or industrial institutions. Often, an academic institution such as a university will have a specific applied research program funded by an industrial partner interested in that program.

2). From the viewpoint of objectives, a research can be classified as

-descriptive

-correlational

-explanatory

-exploratory

Descriptive research attempts to describe systematically a situation, problem, phenomenon, service or programme, or provides information about, say, living condition of a community, or describes attitudes toward an issue.

Correlational research attempts to discover or establish the existence of a relationship/interdepence between two or more aspects of a situation.

Explanatory research attempts to clarify why and how there is a relationship between two or more aspect of a situation or phenomenon.

Exploratory research is undertaking to explore an area where little is known or to investigate the possibilities of undertaking a particular research study (feasibility study/pilot study).

in practice most studies are a combination of the first three categories.

3. Inquiry Mode:

From the process adopted to find answer to research question – the two approaches are:

-Structural approach

- Unstructured approach

Structural approach:

The structural approach to inquiry is usually classified as *quantitative research*.

Here everything that form the research process- objective, design, sample, and the question that you plane to ask of respondents- is predetermined.

It is more appropriate to determine the *extent* of a problem, issue or phenomenon by quantifying the variation.

e.g. how many people have particular problem? How many people hold a particular attitude?

*Unstructured approach:*The unstructured approach to inquiry is usually classified as *qualitative research*.

This approach allows flexibility in all aspects of the research process. It is more appropriate to explore the nature of a problem, issue or phenomenon *without quantifying it.*

Main objective is to describe the *variation* in a phenomenon, situation or attitude.

e.g. description of an observed situation, the historical enumeration of events, an account of different opinions different people have about an issue, description of working condition in a particular industry.

Both approaches have their place in research. Both have their strength and weaknesses.

In many studies you have to combine both qualitative and quantitative approaches.

For example, suppose you have to find the types of cuisine/accommodation available in a city and the extent of their popularity.

Types of cuisine is the qualitative aspect of the study as finding out about them entails description of the culture and cuisine.

The *extent of their popularity* is the quantitative aspect as it involves estimating the number of people who visit restaurant serving such cuisine and calculating the other indicators that reflect the extent of popularity.

Types of research (In detail)

There are different types of research. The basic ones are as follows:

1) Descriptive vs. Analytical:

Descriptive research comprises surveys and fact-finding enquiries of different types. The main objective of descriptive research is describing the state of affairs as it prevails at the time of study. The term ex post facto research is quite often used for descriptive research studies in social sciences and business research. The most distinguishing feature of this method is that the researcher has no control over the variables here. He/she has to only report what is happening or what has happened. Majority of the ex post facto research projects are used for descriptive studies in which the researcher attempts to examine phenomena, such as the consumers' preferences, frequency of purchases, shopping, etc. Despite the inability of the researchers to control the variables, ex post facto studies may also comprise attempts by them to discover the causes of the selected problem. The methods of research adopted in conducting descriptive research arc survey methods of all kinds, including correlational and comparative methods.

Meanwhile in the analytical research, the researcher has to use the already available facts or information, and analyse them to make a critical evaluation of the subject.

2) Applied vs. Fundamental

Research can also be applied or fundamental research. An attempt to find a solution to an immediate problem encountered by a firm, an industry, a business organisation, or the society is known as applied research. Researchers engaged in such researches aim at drawing certain conclusions confronting a concrete social or business problem. On the other hand, fundamental research mainly concerns generalizations and formulation of a theory. In other words, "Gathering knowledge for knowledge's sake is termed 'pure' or 'basic' research" (Young in Kothari 1988). Researches relating to pure mathematics or concerning some natural phenomenon are instances of fundamental research. Likewise, studies focusing on human behaviour also fall under the category of fundamental research. Thus, while the principal objective of applied research is to find a solution to some pressing practical problem, the objective of basic research is to find information with a broad base of application and add to the already existing organized body of scientific knowledge.

3) Quantitative vs. Qualitative

Quantitative research relates to aspects that can be quantified or can be expressed in terms of quantity. It involves the measurement of quantity or amount. The various available statistical and econometric methods are adopted for analysis in such research. They include correlation, regressions, time series analysis, etc.

Whereas, qualitative research is concerned with qualitative phenomenon, or more specifically, the aspects relating to or involving quality or kind. For example, an important type of qualitative research is 'Motivation Research', which investigates into the reasons for human behaviour. The main aim of this type of research is discovering the underlying motives and desires of human beings, using in-depth interviews. The other techniques employed in such research are story completion tests, sentence completion tests, word association tests, and other similar projective methods. Qualitative research is particularly significant in the context of behavioural sciences, which aim at discovering the underlying motives of human behaviour. Such research help to analyse the various factors that motivate human beings to behave in a certain manner, besides contributing to an understanding of what makes individuals like or dislike a particular thing. However, it is worth noting that conducting qualitative research in practice is considerably a difficult task. Hence, while undertaking such research, seeking guidance from experienced expert researchers is important.

4) Conceptual vs. Empirical

A research related to some abstract idea or theory is known as conceptual research. Generally, philosophers and thinkers use it for developing new concepts or for reinterpreting the existing ones. Empirical research, on the other hand, exclusively relies on observation or experience with hardly any regard for theory and system. Such research is data based. They often come up with conclusions that can be verified through experiment or observation. They are also known as experimental type of research. Under such research, it is important to first collect facts, their source and actively do certain things to stimulate the production of desired information. In such a research, the researcher must first identify a working hypothesis or make a guess of the probable results. Next, he/she gathers sufficient facts to prove or disprove the stated hypothesis. Then he/she formulates experimental designs, which according to him/her would manipulate the individuals or the materials concerned, so as to obtain the desired information. This type of research is thus characterized by the researcher's control over the variables used to study their effects. Empirical research is most appropriate when an attempt is made to prove that certain variables influence the other variables in some way. Therefore, the results obtained using the experimental or empirical studies arc considered as one of the most powerful evidences for a given hypothesis.

5) Other types of research: The remaining types of research are variations of one or more of the afore-mentioned methods. They vary in terms of the purpose of research, or the time required to complete it, or based on some other similar factor. On the basis of time, research may either be in the nature of one time or longitudinal research. While the research is restricted to a single time-period in the former case, it is conducted over several time-periods in the latter case. Depending upon the environment in which the research is to be conducted, it may also be laboratory research or field-setting research, or simulation research, besides being diagnostic or clinical in nature. Under such research, in-depth approaches or case-study methods may be employed to

analyse the basic causal relations. These studies usually conduct a detailed in-depth analysis of the causes of things or events of interest, and use very small samples and a sharp data collecting method. The research may also be explanatory in nature. Formalized research studies consist of substantial structure and specific hypotheses to be verified. As regards historical research, sources like historical documents, remains, etc., are utilized to study past events or ideas. It also includes philosophy of persons and groups of the past or any remote point of time. Research is also categorized as decision-oriented and conclusion-oriented. In the case of decision-oriented research, it is always carried out for the need of a decision maker and hence, the researcher has no freedom to conduct the research as per his/her own desires. Whereas, under conclusion-oriented research, the researcher is free to choose the problem, redesign the enquiry as it progresses and even change conceptualization as he/she wishes to. Further, operations research is a kind of decision- oriented research, because it is a scientific method which provides the executive departments a quantitative basis for decision-making with respect to the activities under their purview.

RESEARCH LEVEL

It means that not all researches take place at the same level of scientific sophistication. The level of research differs. Some are of high level, of comparatively low level, and intermediate level.
It depends upon the type and nature and area of discipline around which the research is carried out. The level of research are often define in four levels:

1. **Descriptive level**
   Most basic level of research, in which the researcher is concerned with the description of the event or phenomena as if exists around us.
2. **Classification level**
   This level of research is at higher level than that of the first level.
   The researcher goes into a little bit deeper study of observation in the light of similarities and dissimilarities leading to the classification of the things he is studying on the basis of known natural characteristics.
3. **Explanation level**
   Higher than the second level, as to seeking explanation of the similarities and dissimilarities of the phenomena.
   E.g. why do certain approaches to management seem to prevail in some countries and not in others.
   It may lead to development of a theory about a phenomenon of study.
4. **Prediction level**
   Highest level of research
   Using established theories and models, the researcher is expected to predict a phenomenon or variable on the bodies of another.

RESEARCH OBJECTIVES:

Although, every research project happens to have the general objectives, each and every research study or project has its own important primary and particular objective, which may be termed as research objective. The objective may be termed as Broad objective and specific objective often goal of research is also mentioned in connection of research objectives.

b) Broad objective
   - The general statement about the solution of the problem of research, which a particular research wants to achieve.
   - It is stated in terms of broad perspectives of the study.
   - It is written in one or two paragraphs in the research project document explaining the general achievements targeted by the research.

c) Specific objective
   - The broad objective encompasses a number of specific points of achievements which the research aspires to fulfill in pinpoint manner. These are known as specific objectives and are stated in terms of specific points preferably in sequential order.
   - other relevant small specific targets to be achieved in conjunction with the broad objective of the research.

GOALS

- When objectives of a research are fulfilled, it is said that goal of research has been achieved.
- Fulfillment of the objectives of research. It is to be stated to reflect all the objectives set for the research study.

Goals of Research:

1) to review and synthesize existing knowledge.
2) to investigate some existing situation/ problem
3) to provide solutions to the problem
4) to explore and analyze more general issues
5) to construct or create new procedure or system
6) to explain a new phenomenon
7) to generate new knowledge
8) a combination of any of the above

Add new info through:

- New facts that was not known before
- Validates results of previous research
- Test theories
- Explains findings of a previous research
   - find out new relationships among present phenomena.

CHAPTER-6

DATA AND INFORMATION FOR RESEARCH

Data and its types:

Data is the building block of any research. Data can be defined as the values collected through record-keeping or polling, observing or measuring. In simple terms, data is facts, texts or numbers that can be collected.

There are three categories of data:

i) Subjective vs. Objective
ii) Qualitative vs. Quantitative and
iii) Primary vs. Secondary

Primary Vs. Secondary Data

Primary data is original data gathered at first hand for the research project at hand. Thus, primary data is collected for meeting the specific objectives of the study. Primary sources include interviews, questionnaires, observations or experiments. The main advantage of primary data is that the researcher controls the data collection process.

Any data which have been gathered earlier for some other purpose are secondary data in the hands of researcher. Secondary data refer to those for already gathered by others. As this data already exists, it is often more cost-and-time effective to analyze it before looking for primary sources. The sources of secondary data can be divided into two groups: internal and external. The sources of such data include sales information, accounting data and internally generated research reports. External secondary data is collected from sources outside the company. Such sources may include books, periodicals, published reports, data services and computer data banks.

For example, the demographic statistics collected every ten years are the primary data with ministry of health and population of Nepal but the same statistics used by anyone else would be secondary data with that individual.

Methods of Primary Data Collection

OBSERVATION METHOD:

Commonly used in behavioral sciences

It is the gathering of primary data by investigator's own direct observation of relevant *people, actions and situations* without asking from the respondent.

e.g.

- *A hotel chain sends observers posing as guests into its coffee shop to check on cleanliness and customer service.*
- *A food service operator sends researchers into competing restaurants to learn menu items prices, check portion sizes and consistency and observe point-of purchase merchandising.*
- *A restaurant evaluates possible new locations by checking out locations of competing restaurants, traffic patterns and neighborhood* conditions.

Observation can yield information which people are normally *unwilling or unable to provide.*

e.g. Observing numerous plates containing uneaten portions the same menu items indicates that food is not satisfactory.

Types of Observation:

1. Structured – for descriptive research
2. Unstructured—for exploratory research
3. Participant Observation
4. Non- participant observation
5. Disguised observation

Limitations:

- Feelings, beliefs and attitudes that motivate buying behavior and infrequent behavior cannot be observed.
- expensive method

Because of these limitations, researchers often supplement observation with survey research.

SURVEY METHOD

Approach most suited for gathering descriptive information.

Structured Surveys: use formal lists of questions asked of all respondents in the same way.

Unstructured Surveys: let the interviewer probe respondents and guide the interview according to their answers.

Survey research may be Direct or Indirect.

Direct Approach: The researcher asks direct questions about behaviours and thoughts. e.g. Why don't you eat at MacDonalds?

Indirect Approach: The researcher might ask: "What kind of people eat at MacDonald's?"

From the response, the researcher may be able to discover why the consumer avoids MacDonald's. It may suggest factors of which the consumer is not consciously aware.

ADVANTAGES:

- can be used to collect many different kinds of information
- Quick and low cost as compared to observation and experimental method.

LIMITATIONS:

- Respondent's reluctance to answer questions asked by unknown interviewers about things they consider private.
- Busy people may not want to take the time
- may try to help by giving pleasant answers
- unable to answer because they cannot remember or never gave a thought to what they do and why
- may answer in order to look smart or well informed.

CONTACT METHODS:

Information may be collected by

Mail

Telephone

Personal interview

Mail Questionnaires:

Advantages:

- can be used to collect large amounts of information at a low cost per respondent.
- respondents may give more honest answers to personal questions on a mail questionnaire
- no interviewer is involved to bias the respondent's answers.
- convenient for respondent's who can answer when they have time
- good way to reach people who often travel

Limitations:

- not flexible
- take longer to complete than telephone or personal interview
- response rate is often very low
- researcher has no control over who answers.

Telephone Interviewing:

- quick method
- more flexible as interviewer can explain questions not understood by the respondent
- depending on respondent's answer they can skip some Qs and probe more on others
- allows greater sample control
- response rate tends to be higher than mail

Drawbacks:

- Cost per respondent higher
- Some people may not want to discuss personal Qs with interviewer
- Interviewer's manner of speaking may affect the respondent's answers

- Different interviewers may interpret and record response in a variety of ways under time pressure, data may be entered without actually interviewing.

Personal Interviewing:

It is very flexible and can be used to collect large amounts of information. Trained interviewers can hold the respondent's attention and are available to clarify difficult questions.

They can guide interviews, explore issues, and probe as the situation requires.

Personal interview can be used in any types of questionnaire and can be conducted fairly quickly.

Interviewers can also show actual products, advertisements, package and observe and record their reactions and behavior.

This takes two-forms-

Individual - Intercept Interviewing

Group - Focus Group Interviewing

Intercept Interviewing:

Widely used in tourism research.

- allows researcher to reach known people in a short period of time.
- only method of reaching people whose names and addresses are unknown
- involves talking to people at homes, office, on the street, or in shopping malls.
- interviewer must gain the interviewee's cooperation
- time involved may range from a few minutes to several hours (for longer surveys compensation may be offered)
- involves the use of judgmental sampling i.e. interviewer has guidelines as to whom to "intercept", such as 25% under age 20 and 75% over age 60

Drawbacks:

- Room for error and bias on the part of the interviewer who may not be able to correctly judge age, race etc.
- Interviewer may be uncomfortable talking to certain ethnic or age groups.

Focus Group Interviewing:

It is rapidly becoming one of the major research tools to understand people's thoughts and feelings. It is usually conducted by inviting six to ten people to gather for a few hours with a trained moderator to talk about a product, service of organization. The meeting is held in a pleasant place, and refreshments are served to create a relaxed environment.

The moderator needs objectivity, knowledge of the subject and industry, and some understanding of group and consumer behavior.

The moderator starts with a broad question before moving to more specific issues, encouraging open and easy discussion to bring out true feelings and thoughts.

At the same time, the interviewer focuses the discussion, hence the name *focus group interviewing.*

-often held to help determine the subject areas on which questions should be asked in a later, large-scale, structured-direct interview

Comments are recorded through note taking or videotaped and studied later to understand consumer's buying process.

This method is especially suited for managers of hotels and restaurants, who have easy access to their customers.

e.g. Some hotel managers often invite a group of hotel guests from a particular market segment to have a free breakfast with them. Managers get the chance to meet the guests and discuss what they like about the hotel and what the hotel could do to make their stay more enjoyable and comfortable.

The guests appreciate this recognition and the manager gets valuable information. Restaurant managers use the same approach by holding discussion meetings over lunch or dinner.

Drawbacks:

- Cost: may cost more than telephone survey
- Sampling: group interview studies keep small sample size to keep time and cost down, therefore it may be difficult to generalize from the results.
- Interviewer bias.

EXPERIMENTAL METHOD

Also called Empirical Research or Cause and Effect Method, it is a data-based research, coming up with conclusions which are capable of being verified with observation or experiment.

Experimental research is appropriate when proof is sought that certain variables affect other variables in some way.

e.g.

- *Tenderisers (independent variable) affect cooking time and texture of meat (dependent variable).*
- *The effect of substituting one ingredient in whole or in part for another such as soya flour to flour for making high protein bread.*
- *Develop recipes to use products.*

Such research is characterized by the experimenter's control over the variables under study and the deliberate manipulation of one of them to study its effects.

In such a research, it is necessary to get at facts first hand, at their source, and actively go about doing certain things to stimulate the production of desired information.

- Researcher must provide self with a working hypothesis or guess as to the probable results.
- Then work to get enough facts (data) to prove or disprove the hypothesis.
- He then sets up experimental designs which he thinks will manipulate the persons or the materials concerned so as to bring forth the desired information.

Evidence gathered through experimental or empirical studies today is considered to be the most powerful support possible for a given hypothesis.

Lowe, Belle; 1958, Experimental Cookery, John Willey & Sons, New York, pp 34-46

DETERMINING SAMPLE DESIGN

Researchers usually draw conclusions about large groups by taking a sample

A Sample is a segment of the population selected to represent the population as a whole.

Ideally, the sample should be representative and allow the researcher to make accurate estimates of the thoughts and behavior of the larger population.

Designing the sample calls for three decisions:

Who will be surveyed? (The Sample)

- The researcher must determine what type of information is needed and who is most likely to have it.

  How many people will be surveyed? (Sample Size)

- Large samples give more reliable results than small samples. However it is not necessary to sample the entire target population.

  How should the sample be chosen? (Sampling)

- Sample members may be chosen at random from the entire population *(probability sample)*
- The researcher might select people who are easier to obtain information from

  (non-probability sample)

The needs of the research project will determine which method is most effective

Types of Samples

Probability samples

Simple random sample: Every member of the population has a known and equal chance of being selected.

Stratified random sample: Population is divided into mutually exclusive groups such as age groups and random samples are drawn from each group. Cluster(area)sample: The population is divided into mutually exclusive groups such as blocks, and the researcher draws a sample of the group to interview.

Non-probability samples

Convenience sample: The researcher selects the easiest population members from which to obtain information.

Judgment sample: The researcher uses his/her judgment to select population members who are good prospects for accurate information.

Quota sample: The researcher finds and interviews a prescribed number of people in each of several categories.

TOOL FOR DATA COLLECTION (RESEARCH INSTRUMENTS)

The construction of a research instrument or tool for data collection is the most important aspect of a research project because anything you say by way of findings or conclusions is based on the type of information you collect, and the data you collect is entirely dependent upon the questions that you ask of your respondents. The famous saying about computers- "garbage in garbage out"- is also applicable for data collection. The research tool provides the input into a study and therefore the quality and validity of the output (the findings), are solely dependent o it.

Guidelines to Construct a Research Tool:

The underlying principle behind the guidelines suggested below is to ensure the validity instrument by making sure that your questions relate to the objectives of your study.

Step I : Clearly define and individually list all the specific objectives or research Questions for your study.

Step II : For each objective or research questions, list all the associated questions That you want to answer through your study.

Step III : Take each research question listed in step II and list the information Required to answer it.

Step IV : Formulate question(s) to obtain this information.

The Questionnaire:

Structured surveys/ interviews employ the use of a questionnaire.

A questionnaire consists of a set of questions presented to a respondent for answers.

The respondents read the questions, interpret what is expected and then write down the answers themselves.

It is called an Interview Schedule when the researcher asks the questions (and if necessary, explains them) and records the respondent's reply on the interview schedule.

Because there are many ways to ask questions, the questionnaire is very flexible.

Questionnaire should be developed and tested carefully before being used on a large scale.

There are three basic types of questionnaire:

- Closed –ended
- Open-ended
- Combination of both

1. **Closed –ended Questionnaire:**

– Closed ended questions include all possible answers/prewritten response categories, and respondents are asked to choose among them.
– e.g. multiple choice questions, scale questions
– Type of questions used to generate statistics in quantitative research.
– As these follow a set format, and most responses can be entered easily into a computer for ease of analysis, greater numbers can be distributed.

2. **Open-ended Questionnaire:**

– Open-ended questions allow respondents to answer in their own words.
– Questionnaire does not contain boxes to tick but instead leaves a blank section for write in an answer.
– Whereas closed –ended questionnaires might be used to find out how many people use open-ended questionnaires might be used to find out what people think about a service.
– As there are no standard answers to these questions, data analysis is more complex.
– As it is opinions which are sought rather than numbers, fewer questionnaires need to be distributed.

3. **Combination of both:**

– This way it is possible to find out how many people use a service and what they think of the service in the same form.
– Begins with a series of closed –ended questions, with boxes to tick or scales to rank, and then finish with a section of open-ended questions or more detailed response.

How to construct questionnaires:

- Deciding which questionnaire to use-- closed or open ended,

  - self or interviewer administered

- Wording and structure of questions
- Questions should be kept short and simple--avoid double barreled i.e. two questions in one –ask two Qs rather than one.
- Avoid negative questions which have not in them as it is confusing for respondent to agree or disagree.
- Question should not contain Prestige Bias – causing embarrassment or forcing the respondent to give false answer in order to look good. Questions about educational qualification or income might elicit this type of response
- Use indirect questions for sensitive issues- in indirect questions respondents can relate their answer to other people .
- Using closed- ended questions- try to make sure that all possible answers are covered so that respondents are not constrained in their answer. "Don't know" category also needs to be added.
- Avoiding Leading Question: Don't lead the respondent to answer in a certain way. e.g. "How often do you wash your car?" assumes that respondent has a car and he washes his car. Instead, ask a filter question to find if he has a car, and then, 'If you wash your car, how many times a year?'
- Length and ordering of the Questions:
- Keep the questionnaire as short as possible
- Ask easy Qs. Which respondents will enjoy answering
- If combined questionnaire, keep open ended Qs for the end.
- Make Qs as interesting as possible and easy to follow by varying type and length of question
- Group the qs. Into specific topic as this it makes it easier to understand and follow.
- Layout and spacing is important as cluttered Questionnaire is less likely to be answered.

Piloting the Questionnaire

Once you have constructed your questionnaire, you must pilot it.
This means that you must test it out to see if it is obtaining the result you require.

This is done by asking people to read it through and see if there are any ambiguities which you have not noticed.

They should also be asked to comment about the length, structure and wording of the questionnaire.

Alter the questions accordingly

COLLECTING DATA:

Having formulated the research problem, developed a study design, constructed a research instrument and selected a sample, you then collect the data from which you will draw inferences and conclusions for your study. Depending upon your plans, you might commence interviews, mail out a questionnaire, conduct experiments and/or make observations,

Collecting data through any of the methods may involve some ethical issues in relation to the participants and the researcher:

- Those from whom information is collected or those who are studied by a researcher become participants of the study.
- Anyone who collects information for a specific purpose, adhering to the accepted code of conduct, is a researcher.

a) Ethical issues concerning research participants: There are many ethical issues in relation to participants of a research activity.

i) Collecting information:

Your request for information may put pressure or create anxiety on a respondent. Is it ethical?

Research is required to improve conditions. Provided any piece of research is likely to help society directly or indirectly, it is acceptable to ask questions, if you first obtain the respondents' informed consent. If you cannot justify the relevance of the research you are conducting, you are wasting your respondents' time, which is unethical.

ii) Seeking consent:

In every discipline it is considered unethical to collect information without the knowledge of the participant, and their expressed willingness and informed consent. Informed consent implies that subjects are made adequately aware of the type of information you want from them, why the information is being sought, what purpose it will be put to, how they are expected to participate in the study, and how it will directly or indirectly affect them. It is important that the consent should be voluntary and without pressure of any kind.

iii) Providing incentives:

Most people do not participate in a study because of incentives, but because they realize the importance of the study. Is it ethical to provide incentives to respondents to share information with you because they are giving their time? Giving a present before data collection is unethical.

iv) Seeking sensitive information:

Certain types of information can be regarded as sensitive or confidential by some people and thus an invasion to their privacy, asking for such information may upset or embarrass a respondent. For most people, questions on drug use, pilferage, income, age, marital status etc are intrusive. In collecting data you need to be careful about the sensitivities of your respondents.

It is not unethical to ask such questions provided that you tell your respondents the type of information you are going to ask clearly and frankly, and give them sufficient time to decide if they want to participate, without any major inducement.

v) The possibility of causing harm to participant:

When you collect data from respondents or involve subjects in an experiment, you need to examine carefully whether their involvement is likely to harm them in any way. Harm includes l research that might include hazardous experiments, discomfort, anxiety, harassment, invasion of privacy, or demeaning or dehumanizing procedures. If it is likely to, you must make sure that the risk is minimal i.e. the extent of harm or discomfort is not greater that ordinarily encountered in daily life. If the way information is sought creates anxiety or harassment, you need to take steps to prevent this.

vi) Maintaining confidentiality:

Sharing information about a respondent with others for purposes other than research is unethical. Sometimes you need to identify your study population to put your findings into context. In such a situation you need to make sure that at least the information provided by respondents is kept anonymous. It is unethical to identify an individual's responses. Therefore you need to ensure that after the information has been collected, the source cannot be known.

b) <u>Ethical issues relating to the researcher:</u>

(i) Avoiding bias:

Bias on the part of the researcher is unethical. Bias is a deliberate attempt to either to hide what you have found in your study, or highlight something disproportionately to its true existence.

(ii) Provision or deprivation of a treatment:

Both the provision and deprivation of a treatment/ intervention may pose an ethica dilemma for you as a researcher. Is it ethical to provide a study population with an

intervention/ treatment that has not yet been conclusively proven effective or beneficial? But if you do not test, how can you prove or disprove its effectiveness or benefits?

There are no simple answers to these dilemmas. Ensuring informed consent, 'minimum risk' and frank discussion as to the implications of participation in the study will help to resolve ethical issues.

(iii) Using inappropriate research methodology:

It is unethical to use a method or procedure you know to be inappropriate e.g. selecting a highly biased sample, using an invalid instrument or drawing wrong conclusions.

(iv) Incorrect reporting:

To report the findings in a way that changes or slants them to serve your own or someone else's interest is unethical.

(v) Inappropriate use of the information:

The use of information in a way that directly or indirectly adversely affects the respondents is unethical. If so, the study population needs to be protected. Sometimes it is possible to harm individuals in the process of achieving benefits for the organizations. An example would be a study to examine the feasibility of restructuring an organization. Restructuring may be beneficial to the organization as a whole bur may be harmful to some individuals.

Should you ask respondents for information that is likely to be used against them? It is ethical to ask questions provided you tell respondents of the potential use of the information, including the possibility of it being used against some of them, and you let them decide if they want to participate.

PROCESSING AND ANALYSING DATA

Processing and analyzing data involves a number of closely related operations which are performed with the purpose of summarizing the collected data and organizing these in a manner that they answer the research questions (objectives).

The Data Processing operations are:

1) Editing- a process of examining the collected raw data to detect errors and omissions and to correct these when possible.
2) Classification- a process of arranging data in groups or classes on the basis of common characteristics. Depending on the nature of phenomenon involved
    a) Classification according to attributes: here data is analyzed on the basis of common characteristics which can either be

: Descriptive such as literacy, sex, religion etc. or
: Numerical such as weight, height, income etc.

Such classification can be either:

Simple classification: where we consider only one attribute, and divide the universe into two classes—one class consisting of items possessing the given attribute and the other class consisting of items which do not possess the given attribute.

Table 1. Hotel Employees with MBA Degree

MBA Degree	Yes	No	Total
	21	9	30

Manifold classification: Here we consider two or more attributes simultaneously, and divide the data into a number of classes.

Table 2. Educational Qualification of Hotel Employees

	Yes		No		Total	
	M	F	M	F	M	F
MBA Degree	12	9	3	6	15	15
B.Sc. H & HA	12	15	0	0	15	15

b) Classification according to class –intervals: is done with data relating to income, age, weight, tariff, production, occupancy etc. Such quantitative data are known as the statistics of variables and are classified on the basis of class –intervals.
e.g. Persons whose income are within Rs 2001 to Rs. 4000 can form one group or class, those with income within Rs. 4001 to 6000 can form another group or class and so on.
The number of items which fall in a given class is known as the frequency of the given class.

Table 3. Pocket Money Received by IHM Students

Income Range	**Frequency**	**%**
Rs. 1001 – 2000	10	50
Rs. 2001 – 3000	8	40
Rs. 3001-4000	2	10
Total	20	100

3) Tabulation – Tabulation is the process of summarizing raw data and displaying the same in compact form for further analysis. It is an orderly arrangement of data in columns and rows. Tabulation is essential because:
   a) It conserves space and reduces explanatory and descriptive statement to a minimum
   b) It facilitates the process of comparison
   c) It facilitates the summation of items and the detection of errors and omissions.
   d) It provides the basis for various statistical computations.

   Tabulation may also be classified as simple and complex tabulation. Simple tabulation generally results in one-way tables which supply answers to questions about one characteristic of data only. Complex tabulation usually results on two-way tables (which give information about two inter-related characteristics of data), three-way tables or still higher order tables, also known as manifold tables.

Data Analysis Methods

Qualitative Data Analysis:
Qualitative data analysis is a very personal process with few rigid rules and procedures. For this purpose, the researcher needs to go through a process called *Content Analysis.*
Content Analysis means analysis of the contents of an interview in order to identify the main themes that emerge from the responses given by the respondents .This process involves a number of steps:

Step 1. *Identify the main themes.* The researcher needs to carefully go through the descriptive responses given by respondents to each question in order to understand the *meaning* they communicate. From these responses the researcher develops broad themes that reflect these meanings People use different words and language to express themselves. It is important that researcher select wording of the theme in a way that accurately represents the meaning of the responses categorized under a theme. These themes become the basis for analyzing the text of unstructured interviews.

Step 2. *Assign codes to the main themes:* If the researcher wants to count the number of times a theme has occurred in an interview, he/she needs to select a few responses to an open- ended question and identify the main themes. He/she continues to identify these themes from the same question till a saturation point is reached. Write these themes and assign a code to each of them, using numbers or keywords.

Step 3. *Classify responses under the main themes:* Having identified the themes Next step is to go through the transcripts of all the interviews and classify the responses under the different themes.

Step 4. *Integrate themes and responses into the text of your report:* Having identified responses that fall within different themes, the next step is to integrate into the text of your report. While

discussing the main themes that emerged from their study, some researchers use verbatim responses to keep the feel of the response. There are others who count how frequently a theme has occurred, and then provide a sample of the responses. It entirely depends upon the way the researcher wants to communicate the findings to the readers.

Quantitative Data Analysis:
This method is most suitable for large well designed and well administered surveys using properly constructed and worded questionnaire.

Data can be analysed either *manually* or with the help of a *computer.*

Manual Data Analysis: This can be done if the number of respondents is reasonably small, and there are not many variables to analyse.

However, this is useful only for calculating frequencies and for simple cross-tabulations.

Manual data analysis is extremely time consuming. The easiest way to do this is to code it directly onto large graph paper in columns. Detailed headings can be used or question numbers can be written on each column to code information about the question.

To manually analyze data (frequency distribution), count various codes in a column and then decode them.

In addition, if you want to carry out statistical tests, they have to be calculated manually. *However, the use of statistics depends on your expertise and the desire/need to communicate the findings in a certain way.*

Data Analysis Using a Computer:

If you want to analyse data using computer, you should be familiar with the appropriate program. In this area, knowledge of computer and statistics plays an important role.

The most common software is SPSS for windows. However, data input can be long and laborious process, and if data is entered incorrectly, it will influence the final results.

CHAPTER-7

WRITING A RESEARCH PROPOSAL

Selection of a Research Topic:

It is an important task, since the topic we choose will be the subject, which we will spend the next several months studying. Therefore, it is particularly important to select a topic that we really enjoy working with.

A topic is what the project or research paper is all about. It provides a focus for our writing. Though the major topic can be broken down into its components, the important thing is that we should stick with just one topic in order to have coherent piece of writing.

Possible sources in finding a topic:

- A problem of our own interest. Such a problem may be suggested by our past experience in business, government agencies or other organizations. Choosing a topic from personal interest is one of the best methods.
- Articles in the newspaper and journals
- Projects works in college libraries, which have been completed by previous graduate students and researchers.
- Another possible topic is the development of a research instrument. After developing a method to measure opinion about a certain product or attitude about an existing service, a similar topic would be a questionnaire assessing the need for a community service or evaluating an existing service organization
- Discussing with advisor.
  When choosing your own topic, we need to consider the following
    - Brain storm for ideas
    - Read general background information
    - focus on a manageable topic
    - make a list of useful keywords
    - be flexible
    - define topic as a focused research question
    - research and read more about topic
    - formulate a problem statement which usually is one or two sentences that precisely states what is to be answered or proven.

Suggestions which can aid in making a wise topic selection:

- The sooner we start, the easier our project report writing will be
- consider the size of the topic. Pick a subject that is not too broad or two small.

- choose a topic which is not too complex. More than two or three variables should not be investigated.
- be sure there is available material and data on the topic.

Attributes of a Good Research Topic: Saunders, Lewis and Thornhill (2003)

- Does the topic fit the specifications and meet the standards set by the University?
- It the topic fascinating?
- Is the issue feasible (technically) or researchable?
- Do we have necessary skills?
- Is the research topic achievable within the time available?
- Are financial resources sufficient?
- Is the required data accessible?
- Are the research questions and objectives are clearly stated?
- Does the research topic match career goals? Will it contribute to attaining such goals?

Criteria for selecting a Research Topic:

1) Interest
2) Relevance
3) Avoidance of duplications
4) Feasibility
5) Acceptability
6) Applicability
7) Cost Effectiveness
8) Ethical Considerations

Research Proposal:

- It is the presentation of an idea we wish to pursue. It is an argument fro the proposed study. It needs to explain the logic behind the proposed study, rather than simply summarize or describe the study. A good research proposal presumes that we have already thought of our project and devoted some time and effort in gathering information, studying and then organizing our thoughts.
- Document describing the research plan, objectives and approach to research undertaking.
- It is important to persuade research organizations/ funding agencies to fund research undertaking.
- For Graduate students, it is a scholastic document, which answers:
    1. What research are you proposing?

2. Research problem or Research (statement in the form of questions identifying the relationship or parameters that the researcher wishes to evaluate) question?
   (What are you looking at?)
3. Approach or Methodology
   How are you going to address or explore the problem?
4. What time frame? What is your working calendar? What cost and resources?

Characteristics of a good research problem:

- outstanding- existing since long time (loadshedding, poverty, Bagmati pollution)
- emerging –

Functions of a Research Proposal:Locke, Spiduso and Silverman (2000)

1) A means of communication from the researcher to those who will assess, approve and possibly fund the project.
2) A plan for action to describe the scope, aim, step-by-step procedures and expected outcomes of the work.
3) A contract that will form the basis of agreement between the parties involved e.g. researcher, supervisors, funding agencies, institutions (University/ college)
4) The signed agreement that cannot be altered without the agreement of all the parties involved.

Elements of a Research Proposal:-

Frontal Matter:- Letter of Transmittal, Title(to encapsulate the essence of your research in a few words), Sypnosis/ Summary

Body

1. Background
2. Research Questions/ statement of the problem
3. Literature Review
4. Objectives
5. Methodology
6. Working Calendar / Time frame
7. Resources and Budget

Bibliography/ References

Appendices/ Annex

Explanation:

1. Background
    - Introduce the topic, why pertinent?
    - Motivation statement, how you developed interest in it?
    - Relevance of the proposed study
    - $1/10^{th}$ of the total length or proposal
    - well thought/ developed – navigating the research activities
2. Statement of the problem
    - It is the focal point of the research
    - Good problem statements answer the question "why does this research need to be conducted?"
    - It is just in one sentence, accompanied by several paragraphs to elaborate the problem.
3. Literature Review
    - Previous studies between variables/ research helps developing background information
    - Books, journals, seminar, proceedings etc., helps developing internet sources, popular articles,
    - must be updated, no more than 5 years
    - 40% of the total lengths of proposal
4. Objectives
    - statement of intent
5. Methodology (Research Methods)
    - very important section as it tells the evaluators how you plan to tackle the research problem
    - heart of the proposal
    - provides work plan and describes the activities necessary for the completion of the project

Major contents are as follows:

i) Design
    - A brief mention about the research design to be followed what kind of design do you plan to choose?
    - qualitative, quantitative, experimental study?

ii) Subjects/ Participants
    - The population of the study, organizational details, sample size and sampling methods should be explained

iii) Instruments

Sources of data, data collection instruments

What kind of measuring instruments or questionnaire do you plan to choose and why?

iv) Procedure
   - Data collection strategy, how do you plan to carry out your study? What activities? How long does it take?

v) Analysis : The analysis of data (Test of Hypothesis) and the statistical tool to be applied, should be mentioned.

References

List of References /Bibliography

- *List of references contains details only of those works cited in the text.*
- *A bibliography includes sources not cited in the text but which are relevant to the subject.(larger dissertations or thesis)*
- Small research projects will need only a reference section. This includes all the literature to which you have referred in your report. The popular referencing system *Harvard System* lists books and periodicals in the following manner:

For Books

1. Authors surname (alphabetically), followed by their initials,
2. Date of publication
3. Title of book in italics
4. Place of publication, Publisher. e.g.

Philip, T.E.; 1986, *Modern Cookery for Teaching and Trade*, Mumbai, Orient Longman.
For Journal Article:
The title of the article appears in inverted commas and name of the journal comes in italics, followed by volume number and pages of the article. e.g.

Philip, T.E.; "Influence of British Raj on Indian Cuisine"; *Journal of Hospitality Education*; 5:5-11

Appendices:
If you have constructed a questionnaire or Interview schedule for your research, it may be useful to include them in your report as an appendix.
Appendices do not count towards your total number of pages/words. It is a useful way of including relevant material so that the examiner can gain a deeper understanding of your work by reading it.