

# RESEARCH METHODOLOGY

Chapter : 1

3 Hours

## Introduction

### **1.1 Research:**

-studious inquiry or examination;especially:investigation or experimentation aimed at +the discovery and interpretation of facts,revision of accepted theories or laws in the light of new facts,or practical application of such new or revised theories or law.

-the collecting of information about a particular subject.

-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.

-Research comprises "creative work undertaken on a systematic basis in order to increase the stock of knowledge,including knowledge of humans,culture and society, and the use of this stock of knowledge to devise new applications."It is used to establish or confirm facts,reaffirm the results of previous work,solve new or existing problems,support theorems or develop new theories.

-The word research is derived from the Middle French "recherche",which means "to go about seeking",the term itself being derived from the Old French term "recherchier" a compound word from "re-+"+cerchier", or "sercher",meaning 'search'.

### **1.2 Definition/Meaning of Research:2015/F,2014/S,2015/S**

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:

A broad definition of research is given by Godwin Colibao:"In the broadest sense of the word, the definition of research includes any gathering of data,information and facts for the advancement of knowledge."

Another definition of research is given by John W.Creswell, who states that "[r]esearch is a process of steps used to collect and analyze information to increase our understanding of a topic or issue".It consists of three steps: pose a question, collect data to answer the question and present an answer to the question.

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 formulated 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.

The word research is composed of two syllables, re and search. re is a prefix meaning again, a-new 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 inquiry that utilizes acceptable scientific methodology to solve problems and create new knowledge that is generally applicable.

### **1.3 Objectives of research: 2016/S, 2014/S, 2016/F**

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 analyze the frequency with which something occurs (i.e. diagnostic research studies)
4. to examine a hypothesis of a causal relationship between two variables (i.e. hypothesis-testing research studies)

### **1.4 Research methods versus methodology: 2017/F(difference), 2016/F(define)**

The differences between research method and research methodology can be drawn clearly on the following grounds:

- 1) The research method is defined as the procedure or technique applied by the researcher to undertake research. On the other hand, research methodology is a system of methods, used scientifically for solving the research problem.
- 2) The research method is nothing but the behavior or tool, employed in selecting and building research technique. Conversely, research methodology implies the science of analyzing, the manner in which research is conducted appropriately.
- 3) The research method is concerned with carrying out experiment, test, surveys, interviews, etc. As against this, research methodology is concerned with learning various techniques which can be employed in the performance of experiment, test or survey.

4) Research method covers various investigation techniques. Unlike, research methodology, which consists of complete approach aligned towards the attainment of purpose.

5) Research method intends to discover the solution to the problem at hand. In contrast, research methodology aspires to apply appropriate procedures, with a view to ascertaining solutions.

The scope of research methodology is wider than that of research method, as the latter is the part of the former. For understanding the research problem thoroughly, the researcher should know the research methodology along with the methods.

BASIS OF COMPARISON	RESEARCH METHOD	RESEARCH METHODOLOGY
Meaning	Research Method implies the methods employed by the researcher to conduct research.	Research methodology signifies way to efficiently solving research problems.
What is it?	Behavior and instrument used in the selection and construction of the research technique.	Science of understanding, how research is performed methodically.
Encompasses	Carrying out experiment, test, surveys and so on.	Study different techniques which can be utilized in the performance of experiment, test, surveys etc.
Comprise of	Different investigation techniques.	Entire strategy towards achievement of objective.
Objective	To discover solution to research problem.	To apply correct procedures so as to determine solutions.

### **1.5 Importance of knowing how to conduct research:2017/F**

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 influence the ability to evaluate and utilize the research findings with confidence.
- III) the knowledge of research methodology equips the researcher with tools that help him/her to observe things objectively.
- IV) the knowledge of methodology helps the research consumer to evaluate research and make rational decisions.

## **1.6 Qualities of a researcher :**

### **Friendly with Respondents:**

A good researcher must have the quality to become friendly with respondents. It should have to talk to them in the same language in which the responding are answering.

### **Least Discouragement:**

If the people are not co-operate to give correct data, the researcher should not be discouraged.

### **Free From Prejudice:**

A researcher would be good if he has no prejudice or bias study about a problematic situation but he is capable of providing clear information.

### **Capacity of Depth Information:**

A researcher should have the capacity to collect more and more information in little time.

### **Accuracy:**

A researcher would be said to be good, if he is accurate in his views. His ideas must be accurate one.

### **Truthful:**

A researcher must have to be truthful. Its idea would be free from false reports and saying information.

### **Keen Observer:**

It is the quality of a good researcher that he may have the ideas of keen and deep observation.

### **Careful in Listening:**

A researcher would be more careful in listening. He would have the quality of listening very low information's even whispering.

### **Low Dependency on Common Sense:**

A researcher should be called good if he has low dependency on common sense but keep in observation all the events and happenings.

### **Least time Consumer:**

Good researcher must have the capacity of least time consuming.

## **1.7 Significance of research { overall :For all fields }**

“All progress is born of inquiry. Doubt is often better than overconfidence, for it leads to inquiry, and inquiry leads to invention” is a famous Hudson Maxim in context of which the significance of research can well be understood. Increased amounts of research make progress possible. Research influences scientific and inductive thinking and it promotes the development of logical habits of thinking and organization.

The role of research in several fields of applied economics, whether related to business or to the economy as a whole, has greatly increased in modern times. The increasingly complex nature of business and government has focused attention on the use of research in solving operational problems. Research, as an aid to economic policy, has gained added importance, both for government and business. Research provides the basis for nearly all government policies in our economic system. For instance, government's budgets rest in part on an analysis of the needs and desires of the people and on the availability of revenues to meet these needs. The cost of needs has to be equated to probable revenues and this is a field where research is most needed. Through research we can devise alternative policies and can as well examine the consequences of each of these alternatives.

Decision-making may not be a part of research, but research certainly facilitates the decisions of the policy maker. Government has also to chalk out programmes for dealing with all facets of the country's existence and most of these will be related directly or indirectly to economic conditions. The plight of cultivators, the problems of big and small business and industry, working conditions, trade union activities, the problems of distribution, even the size and nature of defense services are matters requiring research. Thus, research is considered necessary with regard to the allocation of nation's resources.

Another area in government, where research is necessary, is collecting information on the economic and social structure of the nation. Such information indicates what is happening in the economy and what changes are taking place. Collecting such statistical information is by no means a routine task, but it involves a variety of research problems. These days nearly all governments maintain large staffs of research technicians or experts to carry on this work. Thus, in the context of government, research as a tool to economic policy has three distinct phases of operation, viz investigation of economic structure through continual compilation of facts; diagnosis of events that are taking place and the analysis of the forces underlying them and the prognosis, i.e. the prediction of future developments.

Research has its special significance in solving various operational and planning problems of business and industry. Operations research and market research, along with motivational research, are considered crucial and their results assist, in more than one way, in taking business decisions.

Market research is the investigation of the structure and development of a market for the purpose of formulating efficient policies for purchasing, production and sales. Operations research refers to the application of mathematical, logical and analytical techniques to the solution of business problems of cost minimization or of profit maximization or what can be termed as optimization problems. Motivational research of determining why people behave as they do is mainly concerned with market characteristics. In other words, it is concerned with the determination of motivations underlying the consumer (market) behavior.

All these are of great help to people in business and industry who are responsible for taking business decisions. Research with regard to demand and market factors has great utility in business. Given knowledge of future demand, it is generally not difficult for a firm, or for an industry to adjust its supply schedule within the limits of its

projected capacity. Market analysis has become an integral tool of business policy these days. Business budgeting, which ultimately results in projected profit and loss account, is based mainly on sales estimates which in turn depends on business research.

Research in social sciences is concerned both with knowledge for its own sake and with knowledge for what it can contribute to practical concerns. "This double emphasis is perhaps especially appropriate in the case of social science. On the one hand, its responsibility as a science is to develop a body of principles that make possible the understanding and prediction of the whole range of human interactions. On the other hand, because of its social orientation, it is increasingly being looked to for practical guidance in solving immediate problems of human relations.

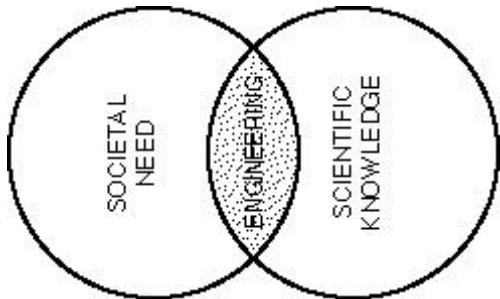
To those students who are to write a master's or Ph.D. thesis, research may mean a careerism or a way to attain a high position in the social structure; To professionals in research methodology, research may mean a source of livelihood; To philosophers and thinkers, research may mean the outlet for new ideas and insights; To literary men and women, research may mean the development of new styles and creative work; To analysts and intellectuals, research may mean the generalizations of new theories.

Thus, research is the fountain of knowledge for the sake of knowledge and an important source of providing guidelines for solving different business, governmental and social problems. It is a sort of formal training which enables one to understand the new developments in one's field in a better way.

### **1.8 Importance of scientific Research for Engineers:2015/F,2016/F,2015/S,2017/S**

Cellular telephones, computers, medical lasers, disease-resistant crops, satellites, biotechnology, optical fiber networks—all these 20th-century technologies and many others can trace their origins at least in part to science and engineering research. New knowledge alone is not enough to achieve major economic, military, or social objectives. But through the combined efforts of business, government and academic and other nonprofit organizations, new knowledge has been converted into new technologies, new means of production and new industries. In the process, science and engineering research has enhanced national security, improved human health, produced a stronger economy and led to a cleaner environment.

Engineering, unlike science, is concerned not only with knowledge of natural phenomena, but also with how knowledge can serve humankind's needs and wants. Such variables as cost, user compatibility, productivity, safety and adaptability to various external operating conditions and environments must be taken into account in the design, development, operational support and maintenance of the products and services that engineers create. Thus, engineering involves the integration of knowledge, techniques, methods and experiences from many fields.



Engineering research seeks improvements in theory and practice in fields such as (for example) high-speed computation, bioengineering, earthquake prediction, power systems, nanotechnology and construction. Major contributors to engineering research around the world include governments, private business, and academia. The results of engineering research can emerge in journal articles, at academic conferences, and in the form of new products on the market.

### **1.9 Examples of research : 2016/S,2017/F**

**Pure research:** Developing algorithm for performing classification based on pixels.

**Applied:** Applying the above mentioned algorithm for detecting individual trees from Drone Images.

**Pure research:** Trying to find relations between carbon cycle and opportunity cost of standing forests by observing the behavior of ecosystems and delving deeper into literature review for back-populating relevant information.

**Applied:** Performing Sensitivity analysis using a multi-objective linear mathematical programming model built on obtained data for finding the trade-off between carbon sequestered and net present value and thereby calculating a break-even price for carbon which can mitigate the global climate change through extension of timber rotation ages.

**Pure research:** Using conditional operators to evaluate the change in number of unoccupied pixels in Canopy Height Models for decreasing height intervals.

**Applied:** Habitat suitability analysis based on above derived parameter, which can be used as a surrogate for canopy cover change with stand height.

#### **Examples of Applied Research :**

- What changes are necessary to create jobs?
- What type of anti-smoking campaigns can reduce smoking among youth or adults?
- How can obesity be prevented?
- What can be done to increase the amount of graduating high school students choosing to attend college?
- Is college tuition becoming prohibitive to young adults being successful and able to support themselves?
- Is technology creating a “dumbing down” of individuals?
- How does tobacco use in various forms affect humans?
- Does marijuana pose a greater or smaller health risk than tobacco, when smoked?

## Chapter : 2

## 4 Hours

# Elements of Research : The research process

### **1.1.Characteristics of research:2014/S**

Certain terms are very commonly used in research and the success of any research depends on these terms.These terms determine whether a research is free of biases, prejudices, and subjective errors or not.They are called the characteristics of research.

#### **A)Reliability:**

Reliability is a subjective term which can not be measured precisely,but today there are instruments which can estimate the reliability of any research.Reliability is the repeatability of any research,research instrument,tool or procedure.If any research yields similar results each time it is undertaken with similar population and with similar procedures,it is called to be a reliable research.Suppose a research is conducted on the effects of single parenting on the class performance of the children. If the results conclude that it causes low grades in class,these results should have to be reliable for another sample taken from a similar population.More the results are similar; more reliability is present in the research.

#### **B)Validity :**

Validity is the strength with which we can make research conclusions,assumptions or propositions true or false.Validity determines the applicability of the research. Validity of the research instrument can be defined as the suitability of the research instrument to the research problem or how accurately the instrument measures the problem.Some researchers say that validity and reliability are co-related,but the validity is much more important than reliability.Without validity,research goes in the wrong direction.To keep the research on-track define your concepts in the best possible manner so that no error occur during the measurement.

#### **C)Accuracy :**

Accuracy is also the degree to which each research process,instrument and tool is related to each other.Accuracy also measures whether research tools have been selected in best possible manner and research procedures suits the research problem or not.For example if a research has to be conducted on the trans-gender people,several data collection tools can be used depending on the research problems but if you find that population less cooperative the best way is to observe them rather than submitting questionnaire because in questionnaire either they will give biased responses or they will not return the questionnaires at all.So choosing the best data collection tool improves the accuracy of research.

#### **D)Credibility :**

Credibility comes with the use of the best source of information and best procedures in research.If you are using second-hand information in your research due to any reason your research might complete in less time but its credibility will be at stake because secondary data has been manipulated by human beings and is therefore not very valid to use in research.A certain percentage of secondary data can be used if the primary source is not available but basing a research completely on secondary data when primary data can be gathered is least credible.When researcher gives accurate

references in the research the credibility of the research increases but fake references also decrease the credibility of the research.

**E)Generalizability :**

Generalizability is the extent to which a research findings can be applied to larger population. When a researcher conducts a study he/she chooses a target population and from this population he takes a small sample to conduct the research. This sample is representative of the whole population so the findings should also be. If research findings can be applied to any sample from the population, the results of the research are said to be generalizable.

**F)Empirical:**

Empirical nature of research means that the research has been conducted following rigorous scientific methods and procedures. Each step in the research has been tested for accuracy and is based on real life experiences. Quantitative research is easier to prove scientifically than qualitative research. In qualitative research biases and prejudice are easy to occur.

**G)Systematic:**

Systematic approach is the only approach to carry on a research. No research can be conducted haphazardly. Each step must follow other. There are set of procedures that have been tested over a period of time and are thus suitable to use in research. Each research, therefore, should follow a procedure.

**H)Controlled :**

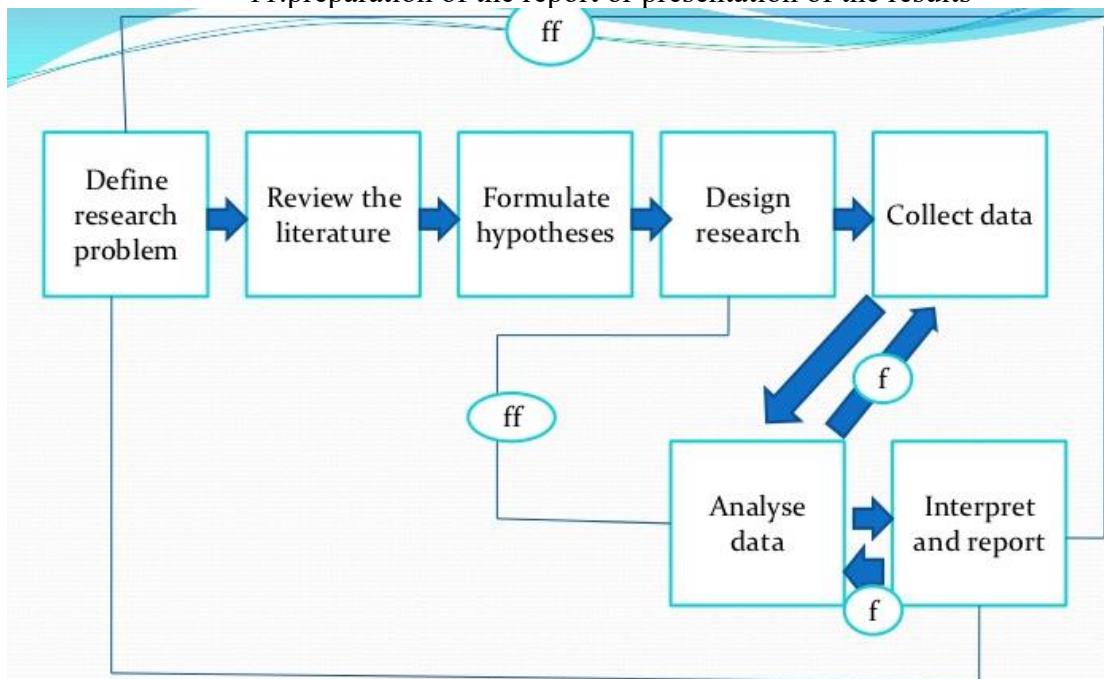
Controlled in real life experience there are many factors that affect an outcome. A single event is often a result of several factors. When similar event is tested in research, due to the broader nature of factors that effect that event, some factors are taken as controlled factors while others are tested for a possible effect. The controlled factors or variables should have to be controlled rigorously. In pure sciences, it is very easy to control such elements because experiments are conducted in the laboratory but in social sciences it becomes difficult to control these factors because of the nature of research.

## **1.2 Research Process:2016/S ,2017/F,2017/S**

- consists of series of actions or steps necessary to carry out the research effectively.
- 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



Where  $f$  = feed back(helps in controlling the sub system)

$ff$ = feed forward(serves the vital function of providing criteria for evaluation)

### Step 1: Define the Problem

- The research process begins with the recognition of a problem or opportunity.
- At the very outset the researcher must single out the problem he wants to study i.e to decide area of interest.

There are two steps involved in research process :

- Understanding the problem thoroughly
- And rephrasing the same into meaningful terms from an analytical point of view
- The best way of understanding the problem is to discuss it with one's own colleagues or with those having the same expertise in the matter.

### Step 2: Extensive Literature Survey

It is necessary for the researcher to conduct an extensive survey connected with the problem. For this purpose Manuals, Company Records, journals, published data can be used.

- Literature review is integral part of entire research process and makes valuable contribution to every operational step.
  - Reviewing literature can be time-consuming, daunting and frustrating, but is also rewarding. **Its functions are:**
- a. Bring clarity and focus to your research problem;
  - b. Improve methodology;
  - c. Broaden knowledge;
  - d. Contextualise findings

### **Step 3: Formulation the objective**

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

- a) main objectives (aims);
- b) sub-objectives.

• The main objective is an overall statement of the thrust of your study.

It is also a statement of the main associations and relationships that you seek to discover or establish.

### **Step 4: Determine Research Design**

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



**Descriptive Studies** are undertaken in organizations to learn and describe the characteristics of a group of employees, as for example, the age, education level, job status and length of service. **Exploratory** studies are study of collection of data in informal manner and unstructured. A **Causal** study is an inquiry to know the cause of one or more problems.

### **Step 5: Collecting The Data 2017/F**

Published data are available in:

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

### **Methods of Data Collection**

- Personal Interview
- Questionnaire
- Telephonic Interview

### **Step 6: Analysis of Data :2017/F**

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

### **Step 7: Execution of project**

Execution of the project is a very important step in the research process. If the execution of the project proceeds on correct lines, the data to be collected would be

adequate and dependable. The researcher should see that the project is executed in a systematic manner and in time. A careful watch and in order to keep the survey as much realistic as possible. Accuracy is very necessary.

### **Step 8:Hypothesis testing**

Facts support Hypothesis or they happen to be contrary.

### **Step 9:Analysis And Interpretations**

Analysis and Interpretation are the central steps in the research process. The goal of analysis is to summaries the collected data in such a way that they provide answer to questions that triggered while research. Interpretation is the research for border, meaning of research finding. 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.

### **Step 10:Preparation of the report**

Researcher has to prepare the report of what has been done by him. 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
- o Appendices
- o Bibliography list of journals, books, reports consulted
- o Index

---

### **1.3 Define research problem.Explain the methods/techniques/way to define the problems.2016/F,2016/S,2017/S**

**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. **2014/S,2015/F,2015/S**

#### **Components of research problem:2015/F**

- 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.

#### **Techniques involved in defining a problem: 2017/F**

-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 immerse 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 came 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.

**1.3 Why literature review is necessary in research? Explain basic steps of reviewing literature. 2015/S, 2015/F, 2017/S**

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 inquiry.

**Procedure/steps 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

**I)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:Books,journals.

**Ii)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.

**Iii)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 relevant 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 suitable 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.

#### **Iv)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. 2016/F

## **Importance of Literature Review**

1. A literature review may be an end in itself to publish it as a review
2. It can be a preparatory work for taking up / motivating future research
3. It can be to choose and formulate a research problem (more appropriately called as 'literature survey')
4. Literature Review enables a researcher to become an expert/ specialist/ authority in the specific area; the expertise acquired is often directly proportional to the efforts put in literature review

## Purposes of Literature Review

1. To understand the purpose and expectations of the prompt for research so as to place appropriate emphasis in the analysis and summary
2. Like laying a brick for building, Literature review enables to continue the tradition cohesively and to integrate past works and sources to the body of knowledge and also to say something new about them
3. To demonstrate knowledge of available sources
4. To identify gaps in theories
5. To check consistency and continuity of existing studies and their results

**1.4 What is the necessity of defining a research problem? Describe the techniques of defining a research problem. 2017/F, 2017/S**

=The necessity of defining a research problem are:

- To avoid deviating from the goal, The definition of a problem sets the direction of the study
- To derive the objectives
- Proper methodology selection of the study.
- Selection of variables of the study.
- Clarity for the readers
- The definition helps the researcher to control subjectivity or biases of the researcher.
- Makes the study feasible

### **1.5 BIBLIOGRAPHY 2016/S**

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.

If you are pursuing or planning to pursue research, bibliography is perhaps the most important element in a research exercise. Without a bibliography, the work is in essence useless. While this may sound extreme, it is true that research without fact checking is worthless. No professor will accept a thesis or research paper without citation and citation is incomplete without a bibliography or reference page.

A **bibliography** is a list that goes at the end of a work of research writing. The list contains all the sources utilized in the thesis. Every bibliographic reference must have the following:

**The author's name:** In every citation format, the author's name is listed first in the bibliography. The bibliography is also ordered by author's last name and in alphabetical order. The only exception to this is in footnotes, for Turabian format, the author's first name is listed first. This style presents bibliographic information in footnotes or end notes.

**The title of the resource:** The title identifies the specific resource used. The title is generally the creative element of the piece; the title of the book, article, news, advertisement gives a hint of its character and lets the reader know what to expect.

**The publisher who published the source:** The name and place of publication is important for verification of the type of source material. For example, if a book is published by McMillan Publishers, it is trusted to be a valid, verified resource and you can count on the facts being true. Each publishing house has editors that fact check and no book would be published by a trustworthy publisher that contained non-verified information.

**The date of publication:** The date of publication is included in the work to let the reader know when the information was published. Remember in today's world, each data has its life. The date is important in your thesis because the reference which you present should not be out of date. The data collected and presented by you also has its life. It's therefore advisable to conclude your research in record time.

## Book

- Author's name: Jones, Fred
- Title: The Gun Control Issue
- City of Publisher: Chicago
- Publisher: Random House
- Copyright: 1998

Jones, Fred. The Gun Control Issue  
Chicago: Random House, 1998

**1.6 Importance of Research problems: 2015/S**

## **The importance of Research Problem**

- The formulation of a research problem is the first and most important step of the research process.
- It is like the identification of a destination before undertaking a journey.
- A research problem is like the foundation of a building. The type and design of the building are dependent upon the foundation.
- A famous saying about computers, 'garbage in, garbage out', is equally applicable to a research problem.
- The formulation of research problem is combination of type of Study design, type of sampling strategy, type of research instrument & type of analysis that can be undertaken.

**1.7 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.

**1.8) Criteria for selecting research topic: 2015/F**

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.

### **1.9 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 Estimate 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.

### **2.0 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.

## Chapter : 3

4 Hours

# ELEMENTS OF RESEARCH:THE THEORETICAL FRAMEWORK

### Measurement:

It 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 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:2015/F,2016/F,2017/S

#### 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:  $0^{\circ}\text{C}$  to  $100^{\circ}\text{C}$

Fahrenheit scale:  $32^{\circ}\text{F}$  to  $212^{\circ}\text{F}$

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 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: 2017/F**

#### **1) The dependent variable:**

If its values depends upon the other variables, then it is known as dependent variable. 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 then it is called independent variable. 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

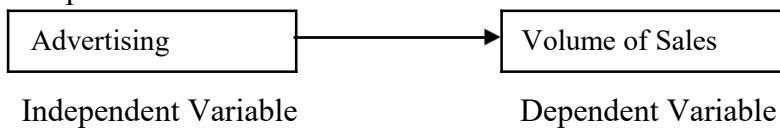
variable,two things are considered,one is the type of variable.Other is the value or numbers for that variable.

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:



Annual Earning (Independent Variable) → Annual Saving (Dependent Variable)

Independent Variable	Dependent Variable
<ul style="list-style-type: none"> <li><input type="checkbox"/> The variable that is <b><i>manipulated</i></b> either by the researcher or by nature or circumstance</li> <li><input type="checkbox"/> Independent variables are also called “stimulus” “input” or “predictor” variables</li> <li><input type="checkbox"/> Analogous to the “cause” in a cause-effect relationship.</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> A variable that is <b><i>observed or measured</i></b>, and that is influenced or changed by the independent variable.</li> <li><input type="checkbox"/> Dependent variables are also known as “response” or “output” or “criterion” variables.</li> <li><input type="checkbox"/> Analogous to the “effect” in a cause-effect relationship.</li> </ul>

**Examples:**

- In a study to determine whether how long a student sleeps affects test scores, the independent variable is length of time spent sleeping while the dependent variable is the test score.
- You want to compare brands of paper towels, to see which holds the most liquid. The independent variable in your experiment would be the brand of paper towel. The dependent variable would be the amount of liquid absorbed by a paper towel.
- In an experiment to determine how far people can see into the infrared part of the spectrum, the wavelength of light is the independent variable and whether the light is observed (the response) is the dependent variable.
- If you want to know whether caffeine affects your appetite, the presence/absence of amount of caffeine would be the independent variable. How hungry you are would be the 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)

**Differentiate between Concept and variables.2017/F**

<u>CONCEPT</u>	<u>VARIABLE</u>
<ul style="list-style-type: none"> <li>- Subjective impression</li> <li>- No uniformity as to its understanding among different people</li> <li>- As such cannot be measured</li> </ul>	<ul style="list-style-type: none"> <li>- Measurable though the degree of precision varies from scale to scale and variable to variable.</li> </ul>

<u>Example(CONCEPT)</u>	<u>Example(VARIABLE)</u>
✓ Excellent	- gender (male/ female)
✓ High achiever	- age (x years y months)
✓ Rich	- weight ( ___ kg)
✓ Satisfaction	- height ( ___ cms)
✓ Domestic violence	- 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*

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

### Hypothesis: {2015/F, 2014/F, 2016/F} (define)

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 based 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:2017/S**

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.

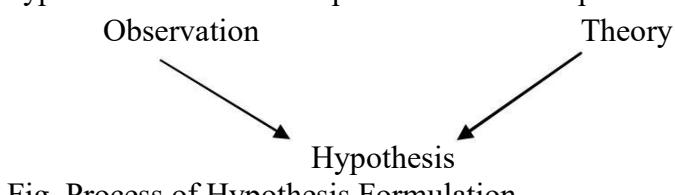


Fig. Process of Hypothesis Formulation

**Function of hypothesis:**

- to adequately explains all the facts connected with the hypothesis.
- It enables us to direct inquiry 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 inquiry. It limits the scope of the procedure for inquiry. It limits the scope of inquiry 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 refuted 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 inquiry. 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.
  - 8.

**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:2014/S,2015/F(state only),2016/F**

#### **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:

Eg:

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 change in the other variable? Such causal relations can be unidirectional, in which variable A influences B, but not vice-versa. 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 excess 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 excess of the standard.

-This is a positive statement whose validity you would attempt to test 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.

$H_0$  : There is no difference between male and female statistically in their productivity.  
Statistically expressed

$H_0 : u_1 = u_2$

$H_0$  : Null hypothesis

$u_1$  : productivity of male workers

$u_2$  : productivity of female workers

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

$H_A$  : Male workers will have more productivity than female workers, or female workers will have less productivity than male workers. Statistically expressed:

$H_A : u_1 > u_2$

$H_A$  : alternate hypothesis

$u_1$  : the productivity of male workers

$u_2$  : 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 if 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.

### **1.1 Indicate the main characteristics of a good hypothesis and uses of a hypothesis in various types of research studies. 2016/S**

=**Main characteristics of a good hypothesis are:**

(i) Hypothesis should be clear and precise.If the hypothesis is not clear and precise, the inferences drawn on its basis cannot be taken as reliable.

(ii)Hypothesis should be capable of being tested. In a swamp of un-testable hypotheses, many a time the research programs have bogged down. Researcher may do some prior study in order to make hypothesis a testable one.A hypothesis “is testable if other deductions can be made from it which, in turn,can be confirmed or disproved by observation.”

(iii)Hypothesis should state relationship between variables,if it happens to be a relational hypothesis.

(iv)Hypothesis should be limited in scope and must be specific.A researcher must remember that narrower hypotheses are generally more testable and he should develop such hypotheses.

(v)Researchers should state hypothesis as far as possible in most simple terms so that the same is easily understandable by all concerned.But one must remember that simplicity of hypothesis has nothing to do with its significance.

(vi)Hypothesis should be consistent with most known facts i.e it must be consistent with a substantial body of established facts.In other words,it should be one which judges accept as being the most likely.

(vii)Hypothesis should be amenable to testing within a reasonable time.One should not use even an excellent hypothesis,if the same cannot be tested in reasonable time for one cannot spend a life-time collecting data to test it.

(viii)Hypothesis must explain the facts that gave rise to the need for explanation.This means that by using the hypothesis plus other known and accepted generalizations,

one should be able to deduce the original problem condition. Thus hypothesis must actually explain what it claims to explain; it should have empirical reference.

### **Uses of a hypothesis in various types of research studies are :2017/F**

- 1) They provide guide and direction to the research.
- 2) They indicate the major independent and dependent variables being considered.
- 3) They suggest the type of data that must be collected.
- 4) They also suggest the type of analysis that must be made.
- 5) They indicate the type of statistical measures appropriate to various tests to be conducted.

### **1.2 How would you differentiate between null and alternative hypothesis?**

**Illustrate with example.2015/S,2017/F**

Null Hypothesis ( $H_0$ )	Alternative Hypothesis ( $H_1$ )
<ul style="list-style-type: none"> <li>▪ Almost always the statement that <i>no</i> difference or relationship exists between the variables of interest.</li> <li>▪ Example: A study looking at deep vein thrombosis (DVT) &amp; the risk of pulmonary embolism (PE) <ul style="list-style-type: none"> <li>- The null hypothesis would be...</li> <li>- "Having DVT <i>does not increase</i> one's risk for developing a PE."</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>▪ The statement that you will be trying to "prove" by conducting your inferential statistics.</li> <li>▪ It is <i>almost</i> always the statement that a difference or relationship <i>does exist</i> between the variables of interest.</li> <li>▪ What would be an alternative hypothesis for our example? <ul style="list-style-type: none"> <li>- "Having DVT <i>increases</i> the risk of developing a PE."</li> </ul> </li> </ul>

BASIS FOR COMPARISON	NULL HYPOTHESIS	ALTERNATIVE HYPOTHESIS
Meaning	A null hypothesis is a statement, in which there is no relationship between two variables.	An alternative hypothesis is statement in which there is some statistical significance between two measured phenomenon.
Represents	No observed effect	Some observed effect
What is it?	It is what the researcher tries to disprove.	It is what the researcher tries to prove.
Acceptance	No changes in opinions or actions	Changes in opinions or actions
Testing	Indirect and implicit	Direct and explicit
Observations	Result of chance	Result of real effect
Denoted by	H-zero	H-one
Mathematical formulation	Equal sign	Unequal sign



$H_1$ : Application of bio-fertilizer 'x' increase plant growth.

### Alternative hypothesis

- ✓ The alternative hypothesis is a hypothesis which the researcher tries to prove.



$H_0$ : Application of bio-fertilizer 'x' do not increase plant growth.

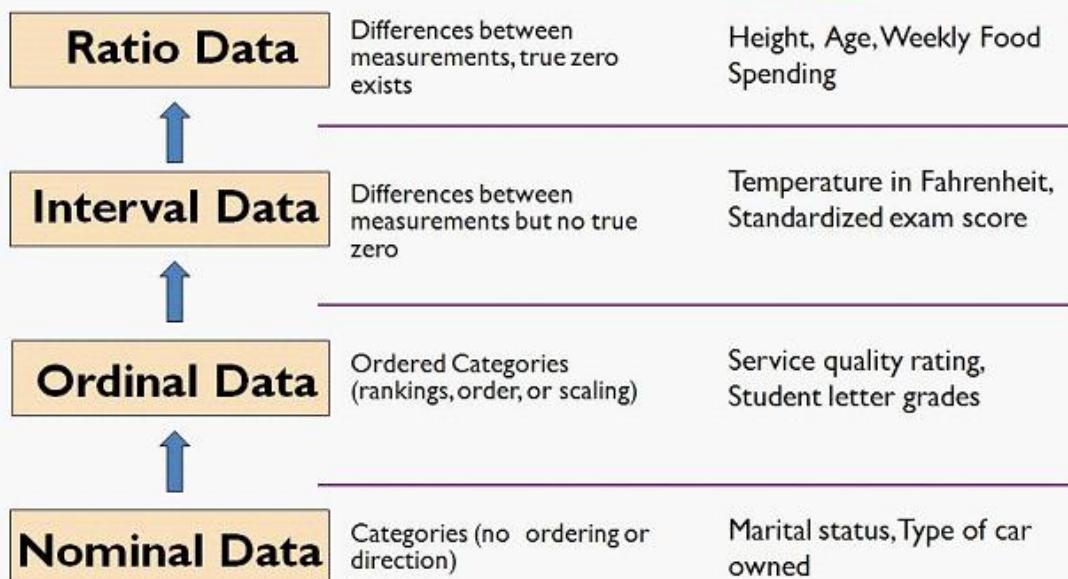
### Null hypothesis

- ✓ The null hypothesis is a hypothesis which the researcher tries to disprove, or nullify.

### 1.3 What are the essential differences among nominal, ordinal, interval and ratio scales? Illustrate with suitable example. 2015/S, 2016/S, 2017/S

= Measurement is the process of observing and recording the observations that are collected as part of a research effort.

#### EXAMPLES:



<b>Scale</b>	<b>Basic Characteristics</b>	<b>Common Examples</b>	<b>Permissible Statistics</b>	
			<b>Descriptive</b>	<b>Inferential</b>
<b>Nominal</b>	Numbers identify & classify objects	Gender, numbering of football players	Percentages, mode	Chi-square, binomial test
<b>Ordinal</b>	Nos. indicate the relative positions of objects but not the magnitude of differences between them	Quality rankings, rankings of teams in a tournament	Percentile, median	Rank-order correlation, Friedman ANOVA
<b>Interval</b>	Differences between objects	Temperature (Fahrenheit)	Range, mean, standard	Product-moment
<b>Ratio</b>	Zero point is fixed, ratios of scale values can be compared	Length, weight	Geometric mean, harmonic mean	Coefficient of variation

### 1.5 Difference Between Hypothesis and Theory.

<b>BASIS FOR COMPARISON</b>	<b>HYPOTHESIS</b>	<b>THEORY</b>
Meaning	An educated guess, based on certain data, as an inception for further research or investigation is called hypothesis.	Theory is a well substantiated explanation of natural phenomena, which is continuously validated through experimentation and observation.
Based on	Limited data	Wide range of data
Testing & Proving	It is not scientifically tested and proven.	It is scientifically tested and proven.
Relies on	Projection or possibility.	Evidence and verification.
Result	Uncertain	Certain
Relationship	Outcome of theory.	Formulated through hypothesis.

### 1.6 Difference Between Survey and Experiment.

<b>BASIS FOR COMPARISON</b>	<b>SURVEY</b>	<b>EXPERIMENT</b>
Meaning	Survey refers to a technique of gathering information regarding a variable under study, from the respondents of the population.	Experiment implies a scientific procedure wherein the factor under study is isolated to test hypothesis.
Used in	Descriptive Research	Experimental Research
Samples	Large	Relatively small

BASIS FOR COMPARISON	SURVEY	EXPERIMENT
Suitable for	Social and Behavioral sciences	Physical and natural sciences
Example of	Field research	Laboratory research
Data collection	Observation, interview, questionnaire, case study etc.	Through several readings of experiment.

### 1.7 Difference Between Questionnaire and Interview.

BASIS FOR COMPARISON	QUESTIONNAIRE	INTERVIEW
Meaning	Questionnaire implies a form consisting of a series of written or printed multiple choice questions, to be marked by the informants.	Interview is a formal conversation between the interviewer and respondent wherein the two participates in the question answer session.
Form	Written	Oral
Nature	Objective	Subjective
Questions	Closed Ended	Open Ended
Information provided	Factual	Analytical
Order of questions	Cannot be changed, as they are written in an appropriate sequence.	Can be changed as per need and preference.
Cost	Economical	Expensive
Time	Informant's own time	Real time
Communication	One to many	One to one
Non-response	High	Low
Identity of respondent	Unknown	Known

### 1.8 Necessity of measurement in research: 2015/F

- research conclusions are only as good as the data on which they are based
- observations must be quantifiable in order to subject them to statistical analysis
- the dependent variable(s) must be measured in any quantitative study.
- the more precise,sensitive the method of measurement,the better.

### 1.9 What is the difference between a research question and Hypothesis.What is the difference between a research question and research investigation.2015/S

**Research Questions:**

Used to analyze and investigate a topic. It is written as a question and is inquisitive in nature. A properly written question will be clear and concise. It should contain the topic being studied (purpose), the variable(s) and the population.

**Three main types of questions:**

**Causal Questions** – Compares two or more phenomena and determines if a relationship exists. Often called relationship research questions. Example: Does the amount of calcium in the diet of elementary school children effect the number of cavities they have per year?

**Descriptive Questions** – Seek to describe a phenomena and often study “how much”, “how often”, or “what is the change”. Example: How often do college-aged students use Twitter?

**Comparative Questions** – Aim to examine the difference between two or more groups in relation to one or more variables. The questions often begin with “What is the difference in...”. Example: What is the difference in caloric intake of high school girls and boys?

The type of research question will influence the research design. Once data has been collected, it will be analyzed and conclusions can be made.

**Hypothesis:**

It is predictive in nature and typically used when significant knowledge already exists on the subject which allows the prediction to be made. Data is then collected, analyzed, and used to support or negate the hypothesis, arriving at a definite conclusion at the end of the research.

It is always written as a statement and should be developed before any data is collected. A complete hypothesis should include: the variables, the population, and the predicted relationship between the variables. Commonly used in quantitative research, but not qualitative research which often seeks answers to open-ended questions.

Examples: A company wellness program will decrease the number sick days claimed by employees. Consuming vitamin C supplements will reduce the incidence of the common cold in teenagers.

**The difference between Research Question and Hypothesis:**

- Though research question and hypothesis serve the same purpose, their differences necessitate using either in a particular research type. In general, quantitative research favors the hypothesis while research question is preferred in qualitative research.
- Hypothesis is predictive in nature and predicts relationship between variables.
- Hypothesis is more specific than research question.
- Research question poses a question while hypothesis predicts the outcome of the research.

**The importance of the hypothesis is as listed as:**

- 1) It determines the method of verification as well as the procedure of inquiry.
- 2) It adequately explains all the facts connected with the research.
- 3) It helps in deciding the direction in which to proceed.
- 4) It suggests experiments and observation.

- 5)It helps to draw the specific conclusion.
- 6)Hypothesis serves as the investigator's eyes in seeing answers to tentatively adopted generalization.
- 7)Hypothesis serves as a necessary link between theory and investigation.
- 8)It places clear and specific goals before the research.
- 9)It prevents blind research & serves as a sort of guiding light .

## **2.0 'Scaling describes the procedures by which numbers are assigned to various degrees of opinion,attitude and other concepts'.Discuss.2017/F**

=Scaling describes the procedures of assigning numbers to various degrees of opinion, attitude and other concepts. It consists of the highest point (in terms of some characteristic e.g preference,favourableness etc.) and the lowest point along with several intermediate points between these two extreme points.

Scaling describes the procedures of assigning numbers to various degrees of opinion, attitude and other concepts. This can be done in 2 ways :

- 1)Making a judgment about some characteristics of them placing him directly on a scale that has been defined in terms of the characteristics.
- 2)Constructing Questionnaires in such a way that the score of individual's responses assigns him a place on a scale.

Scaling techniques are used for assigning numerical positions to individuals responses, to certain situations and objects and to make a finer distinction between them. In a rating or ranking scale the respondent assigns numerical positions to an individual to specify the degree of his observation.Ranks are given in continuum like 1,2,3... And each individuals response is marked at a particular point on the scale.

## **2.1 Types of scale and their Properties :2017/S**

Type of Measurement Scale	Types of Attitude Scale	Rules for Assigning Number	Typical Application	Statistics / Statistical Tests
Nominal	Dichotomous "yes" or "no" scales.	Objects are either identical or different	Classification (by sex, geographic area, social class)	Percentages, mode / chi - square
Ordinal or Rank Order	Comparative, Rank order, Itemized Category, Paired Comparison	Objects are greater or smaller	Rankings (preference, class standing)	Percentile, median, rank-order correlation / Friedman ANOVA
Interval	Likert, Thurstone, Stapel, Associative Semantic-Differential	Intervals between adjacent ranks are equal	Index numbers, temperature scales, attitude measures	Mean, standard deviation, product moment correlations / t-tests, ANOVA, regression, factor analysis
Ratio	Certain scales with special instructions	There is a meaningful zero, so comparison of absolute magnitudes is possible	Sales, incomes, units produced, costs, age	Geometric and harmonic mean, coefficient of variation

**2.1 Describe the Casual Relationship between different Variables.2014/S**

= Explain different types of Variables and show their relationship with each other.  
{ Explained already this topic above : **Types of Variables** }

**2.2 Define theoretical framework and describe the basic components of theoretical framework that need to be incorporated in the research process. 2014/S,2016/F**

=A theoretical framework consists of concepts and, together with their definitions and reference to relevant scholarly literature, existing theory that is used for your particular study. The theoretical framework must demonstrate an understanding of theories and concepts that are relevant to the topic of research paper and that relate to the broader areas of knowledge being considered.

**The theoretical framework strengthens the study in the following ways:**

- 1)An explicit statement of theoretical assumptions permits the reader to evaluate them critically.
- 2)The theoretical framework connects the researcher to existing knowledge.Guided by a relevant theory,you are given a basis for your hypotheses and choice of research methods.
- 3)Articulating the theoretical assumptions of a research study forces you to address questions of why and how.It permits you to intellectually transition from simply describing a phenomenon you have observed to generalizing about various aspects of that phenomenon.
- 4)Having a theory helps you identify the limits to those generalizations.A theoretical framework specifies which key variables influence a phenomenon of interest and highlights the need to examine how those key variables might differ and under what circumstances.

There are three basic features that should be incorporated in any theoretical framework:

- 1)The variables considered relevant to the study should be clearly defined.
- 2)A conceptual model that describes the relationships between the variables in the model should be given.
- 3)There should be a clear explanation of why we expect these relationships to exist.

**Basic components of theoretical framework that need to be incorporated in the research process are :** { Explain below 4 points (I),(II),(III),(IV) in detail }

**I)Measurements**

**II)variables and their Causal Relationship**

**III)Theory**

**IV)Hypothesis**

**Chapter : 4****4 Hours****Elements of Research Design: The research design****1.1 Research Design: 2015/F,2016/F,2017/S**

A research design is the set of methods and procedures used in collecting and analyzing measures of the variables specified in the research problem research. The design of a study defines the study type (descriptive, correlational, semi-experimental, experimental, review, meta-analytic) and sub-type (e.g descriptive-longitudinal case study), research problem, hypotheses, independent and dependent variables, experimental design and if applicable, data collection methods and a statistical analysis plan. Research design is the framework that has been created to find answers to research questions.

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: 2017/F,2016/S,2017/S**

- 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)

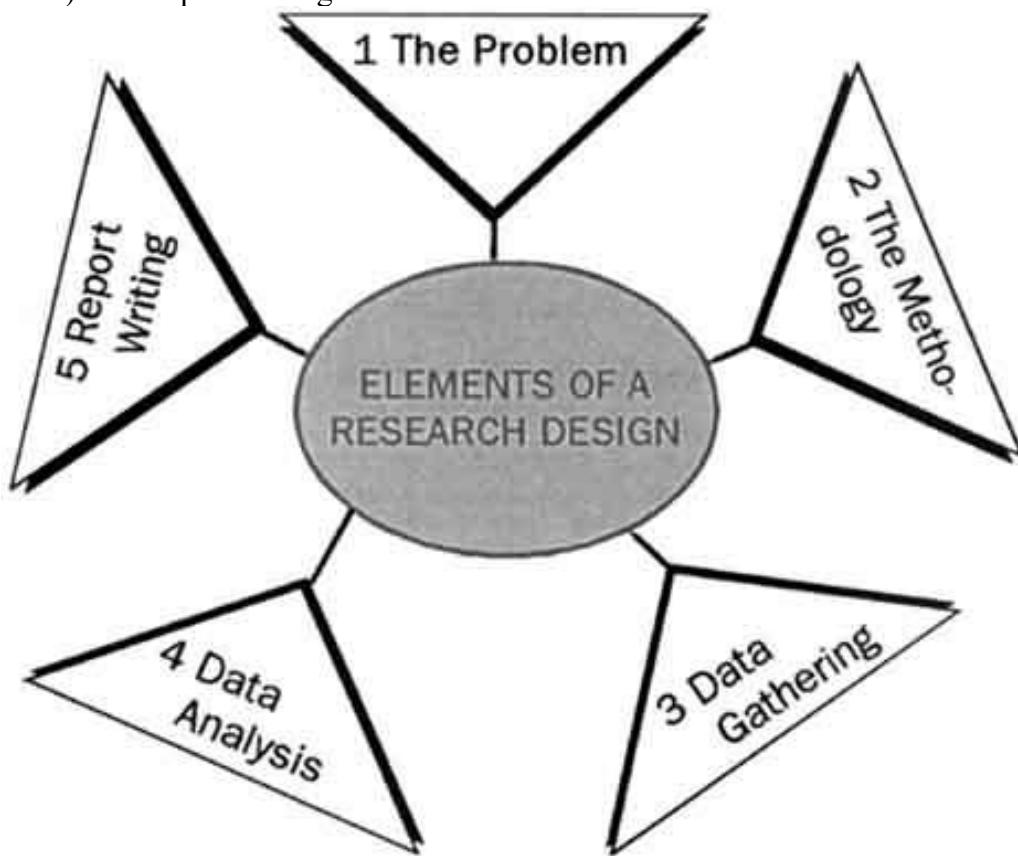
### **1.2 Elements of a Research Design:2015/F,2016/F,2014/S,2016/S**

A research design can be described as a conceptual structure within which research is going to be carried out. It comprises the blueprint for the collection, measurement and analysis of data. Decisions with regards to what, where, when, how much, by what means concerning an enquiry or a research design are taken.

A research design is the arrangement of conditions for collection and evaluation of data in a fashion which is designed to combine relevance to the research purpose with economy in process.

**Basic Elements of Research Design are:**

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



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?

### **1.3 Types of Research Design :2014/S,2015/S**

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)Exploratory Research Design:2016/F,2017/S**

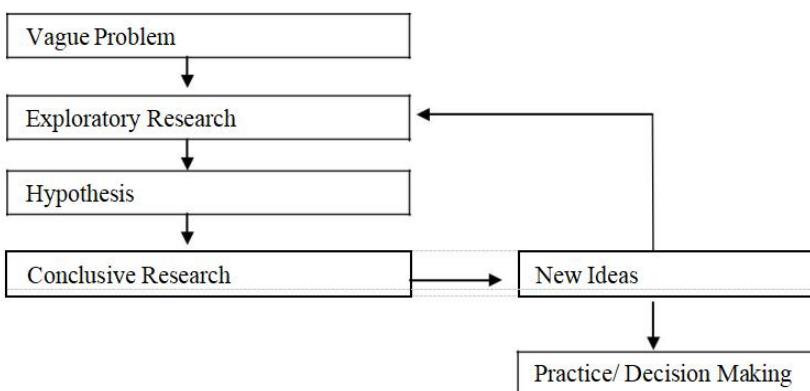


Fig. Types of Research Activities in a sequence.

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 undertaken 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: 2016/F, 2017/S

- 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.

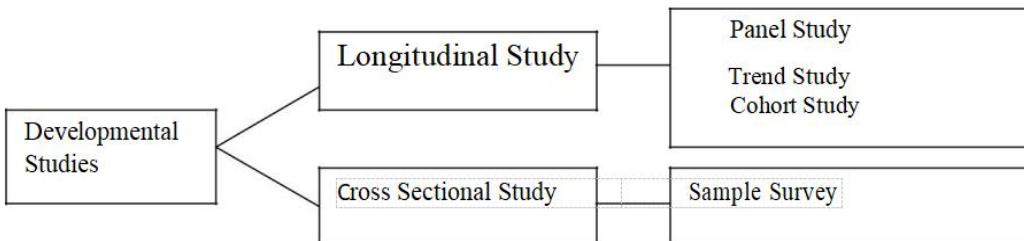
+ Its uniqueness is that source of data being studied are usually not available for your direct scrutiny. The data used are seldom based on direct observation or experimentation.

### B) Descriptive Research:

- It is a fact finding operation searching for adequate information.
- It is a type of study which is generally conducted to evaluate 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.



### Longitudinal Study: 2014/S, 2016/F

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 2005.

**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 in 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) 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: 2017/F, 2016/F**
- 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:

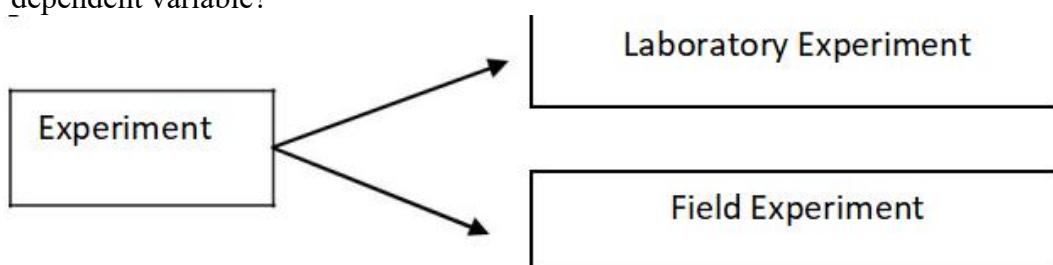
- There is a control or comparison group.
- There is an intact group.
- The treatment is not manipulated it has already occurred.

-It is non experimental research. The independent variable is not manipulated and subjects are randomly assigned to treatment.

#### **4) Experimental Research : 2017/F**

- 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.

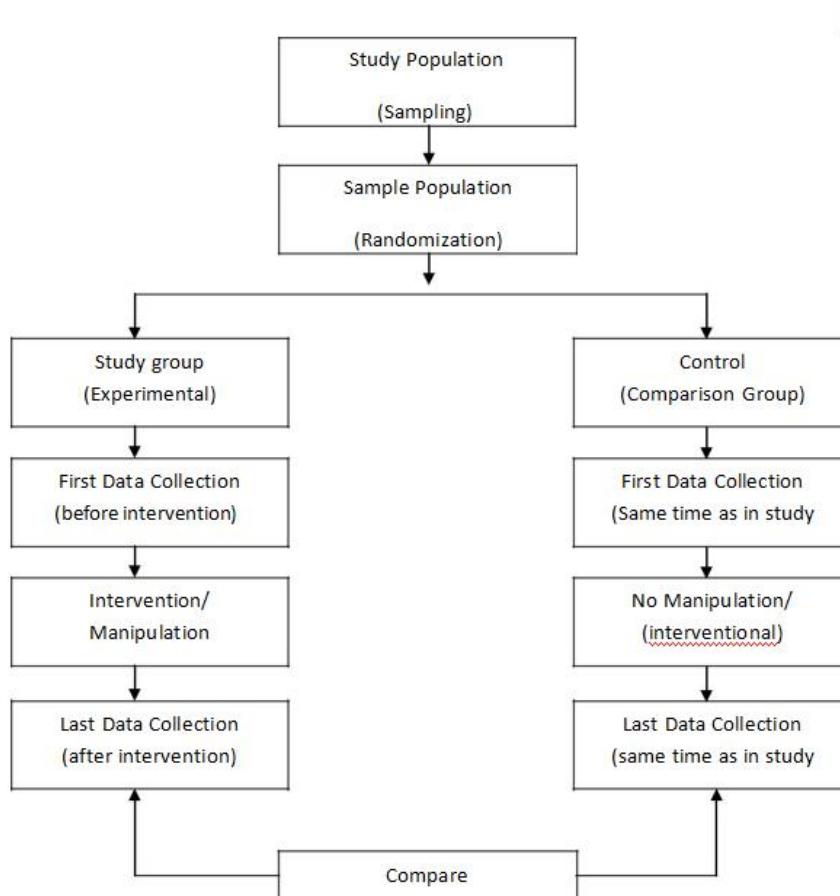


Fig. Diagram of Experimental Study

#### **1.4 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.

EXPLORATORY	DESCRIPTIVE	EXPLANATORY
❖ Become familiar with the basic facts, setting and concerns.	❖ Provide a detailed, highly accurate picture.	❖ Test a theory's predictions or principle.
❖ Create a general mental picture of conditions.	❖ Locate new data that contradict past data.	❖ Elaborate and enrich a theory's explanation.
❖ Formulate and focus questions for future research.	❖ Create a set of categories or classify types.	❖ Extend a theory to new issues or topics.
❖ Generate new ideas, conjectures, or hypotheses.	❖ Clarify a sequence of steps or stages.	❖ Support or refute an explanation or prediction.
❖ Determine the feasibility of conducting research.	❖ Documents a causal process or mechanism.	❖ Link issues or topics with a general principle.
❖ Develop techniques for measuring and locating future data.	❖ Report on the background or context of a situation.	❖ Determine which of several explanations is best.

## **1.5 What is the role of research design in research work? 2017/F,2014/S,2015/S**

A research design is a framework or blueprint for conducting the marketing research project. It details the procedures necessary for obtaining the information needed to structure or solve marketing research problems. In simple words it is the general plan of how you will go about your research.

**To be effective, a research design should furnish at least the following details:**

- A)A statement of objectives of the study or the research output.
- B)A statement of the data inputs required on the basis of which the research problem is to be solved.
- C)The methods of analysis which shall be used to treat and analyze the data inputs.

### **Need for Research Design:**

Research design is needed because it facilitates the smooth sailing of the various research operations, thereby making research as efficient as possible yielding maximal information with minimal expenditure of effort, time and money. Research design has a significant impact on the reliability of the results obtained. It thus acts as a firm foundation for the entire research.

**For example,** economical and attractive construction of house we need a blueprint (or what is commonly called the map of the house) well thought out and prepared by an expert architect, similarly we need a research design or a plan in advance of data collection and analysis for our research project. Research design stands for advance planning of the methods to be adopted for collecting the relevant data and the techniques to be used in their analysis.

### **The need/importance of research design is as follows:**

- It reduces inaccuracy
- Helps to get maximum efficiency and reliability
- Eliminates bias and marginal errors
- Minimizes wastage of time
- Helpful for collecting research materials
- Helpful for testing of hypothesis
- Gives an idea regarding the type of resources required in terms of money, manpower, time and efforts
- Provides an overview to other experts
- Guides the research in the right direction

## **1.6 longitudinal Research 2014/S,2016/F**

A longitudinal study (or longitudinal survey, or panel study) is a research design that involves repeated observations of the same variables (e.g. people) over long periods of time, often many decades (i.e. uses longitudinal data). It is often a type of observational study, although they can also be structured as longitudinal randomized experiments.

# Longitudinal and Cross-Sectional Studies

## Longitudinal Study

- A research technique that studies the same group of individuals over a long period of time.
- Tend to be rare.
- **Advantages:** provide a rich source of data.
- **Disadvantages:** expensive, time-consuming, difficult to conduct, cohort effect.

## Cross-Sectional Study

- A research technique that compares individuals from different age groups at one time.
- More common.
- **Advantages:** much more efficient than longitudinal studies.
- **Disadvantages:** difficult to determine cause and effect, hard to control for differences between groups, cannot measure change.

## 1.7 Describe the Historical research design with its procedure.2016/F, 2014/S,2017/S

The historical method is employed by researchers who are interested in reporting events and/or conditions that occurred in the past. An attempt is made to establish facts in order to arrive at conclusions concerning past events or predict future events.

### Steps to Follow:

- Isolate the problem
- Collect source materials,including primary and secondary sources
- Evaluate source material
- Formulate hypotheses
- Report and interpret findings

Primary Sources of Information -Direct outcomes of events or the records of eyewitnesses:

- Original documents
- Relics
- Remains
- Artifacts

Secondary Sources of Information - Information provided by a person who did not directly observe the event, object, or condition:

- Textbooks
- Newspapers
- Encyclopedias
- Review of research and other references

**External Criticism** - Asks if the evidence under consideration is authentic. The researcher checks the genuineness or validity of the source. Is it what it appears or claims to be? Is it admissible as evidence?

**Internal Criticism** - After the source is authenticated, it asks if the source is accurate, was the writer or creator competent, honest, and unbiased? How long after the event happened until it was reported? Does the witness agree with other witnesses?

## 1.8

# Differences

## Causal-comparative

- No manipulation of the variables.
- Provide weaker evidence for causation.
- The groups are already formed, the researcher must find them.
- Should not/is not/can not be manipulated

## Experimental

- The independent variable is manipulated.
- Provide stronger evidence for causation.
- The researcher can sometimes assign subjects to treatment groups.
- Manipulation of independent variable

Chapter : 5

2 Hours

## **Description of Research**

### **1.1 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:**

I) pure research

II) applied research

**2)From the viewpoint of objectives,research can be classified as:2017/F(explain)**

-descriptive

-correlational

-explanatory

-exploratory

### **3. Inquiry Mode:**

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

-Structural approach

- Unstructured approach

### **1.2 Types of research ( In detail) :2016/S,2017/S**

#### **A) Pure research /Fundamental research :2015/S2014/S,2015/F,2017/S**

Basic research,also called pure research or fundamental research,is scientific research aimed to improve scientific theories for improved understanding or prediction of natural or other phenomena.Pure research,also known as fundamental or basic research,is conducted without any specific goal in mind.The main aim of pure research is to advance knowledge and to identify or explain the relationship between variables.Thus,it advances fundamental knowledge about the world, and introduce new theories,ideas, and principals as well as new ways of thinking.Pure research is the source of most new information and ways of thinking in the world.Pure research is driven by curiosity,intuition, and interest, and is more exploratory in nature than applied research.Sometimes pure research can act as a foundation for applied research.

**For example,**basic science investigations probe for answers to questions such as:

How did the universe begin?

What are protons,neutrons and electrons composed of ?

## **B)Applied Research :2015/S,2014/S,2017/F,2015/F,2017/S**

Applied research, unlike pure research, is conducted in order to solve a specific and practical problem. Therefore, it tends to be descriptive in nature. However, applied research is often based on basic research or pure research. Since it is involved in solving practical problems, it often includes empirical methods. Applied research is used in a variety of fields such as medicine, technology, education, or agriculture. Studying the relationship between genetics and cancer, observing the behavior of children to identify the effectiveness of various interventions are some examples of applied research studies. Such studies always have a specific goal. Moreover, the results of applied research are usually intended for present use, not for future. It is also important to note that applied research studies are always based on the information or theories discovered through basic research.

For example, applied researchers may investigate ways to:

- Improve agricultural crop production
- Treat or cure a specific disease
- Improve the energy efficiency of homes, offices, or modes of transportation

### **Basic research ← → Applied research**

#### **Purpose:**

- Expand knowledge of processes of business and management
- Results in universal principles relating to the process and its relationship to outcomes
- Findings of significance and value to society in general

#### **Context:**

- Undertaken by people based in universities
- Choice of topic and objectives determined by the researcher
- Flexible time scales

#### **Purpose:**

- Improve understanding of particular business or management problem
- Results in solution to problem
- New knowledge limited to problem
- Findings of practical relevance and value to manager(s) in organisation(s)

#### **Context:**

- Undertaken by people based in a variety of settings including organisations and universities
- Objectives negotiated with originator
- Tight time scales

## **C)Descriptive research :2017/F,2017/S**

Descriptive research is used to describe characteristics of a population or phenomenon being studied. It does not answer questions about how/when/why the characteristics occurred. Rather it addresses the "what" question. The description is used for frequencies, averages and other statistical calculations. Often the best approach, prior to writing descriptive research, is to conduct a survey investigation. Qualitative research often has the aim of description and researchers may follow-up with examinations of why the observations exist and what the implications of the findings are.

**Descriptive research refers to research that provides an accurate portrayal of characteristics of a particular individual, situation, or group. Descriptive research, also known as statistical research.**

*These studies are a means of discovering new meaning, describing what exists, determining the frequency with which something occurs, and categorizing information.*

**In short descriptive research deals with everything that can be counted and studied, which has an impact of the lives of the people it deals with.**

For example,

- finding the most frequent disease that affects the children of a town. The reader of the research will know what to do to prevent that disease thus, more people will live a healthy life.

### **Advantages:**

- The people individual studied are unaware so they act naturally or as they usually do in everyday situation;
- It is less expensive and time consuming than quantitative experiments;
- Collects a large amount of notes for detailed studying;
- As it is used to describe and not make any conclusions it is to start the research with it;

### **Disadvantages**

- Descriptive research requires more skills.
- Does not identify cause behind a phenomenon
- Response rate is low in this research.
- Results of this research can change over the period of time.

### **D) Analytical Research :2017/S**

In analytical research, the researcher has to use the already available facts or information, and analyse them to make a critical evaluation of the subject. It involves in-depth study and evaluation of available information in an attempt to explain complex phenomenon. It works within the constraints variables.

DESCRIPTIVE	ANALYTICAL
<ul style="list-style-type: none"> <li>• Descriptive research includes surveys and fact-finding enquiries of different kinds.</li> <li>• The major purpose of descriptive research is description of the state of affairs as it exists at present.</li> <li>• The main characteristic of this method is that the researcher has no control over the variables; he can only report what has happened or what is happening.</li> <li>• Example 1: Examining the fluctuations of U. S. international trade balance during 1974-1995.</li> <li>• 2. Starting from late 1986, the value of U.S. dollar value has steadily increased against the Japanese yen and German Mark. Examining the magnitude of this trend in the value of U.S. dollar is another example of descriptive research:</li> </ul>	<ul style="list-style-type: none"> <li>• In analytical research, on the other hand, the researcher has to use facts or information already available, and analyze these to make a critical evaluation of the material.</li> <li>• Analytical research attempts to explain why and how. It usually concerns itself with cause-effect relationships among variables.</li> <li>• Example 1: Explaining why and how U.S. trade balance move in a particular way over time.</li> <li>• 2. While explaining how and why this surge in the value of U.S. dollar is going to affect the U.S. Is analytical research.</li> </ul>

### **E) Qualitative Research :2017/S**

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 behavior. 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.

## QUALITATIVE RESEARCH

### Advantages

- It enables more complex aspects of a persons experience to be studied
- Fewer restriction or assumptions are placed on the data to be collected.
- Not everything can be quantified, or quantified easily, Individuals can be studied in more depth
- Good for exploratory research and hypothesis generation
- The participants are able to provide data in their own words and in their own way

### Disadvantages

- It is more difficult to determine the validity and reliability of linguistic data
- there is more subjectivity involved in analysing the data.
- “Data overload” – open-ended questions can sometimes create lots of data, which can take along time to analyse!
- Time consuming

### F)Quantitative Research :2017/S

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. Quantitative Research is used to quantify the problem by way of generating numerical data or data that can be transformed into usable statistics. It is used to quantify attitudes, opinions, behaviors, and other defined variables—and generalize results from a larger sample population. Quantitative Research uses measurable data to formulate facts and uncover patterns in research. Quantitative data collection methods are much more structured than Qualitative data collection methods. Quantitative data collection methods include various forms of surveys—online surveys, paper surveys, mobile surveys and kiosk surveys, face-to-face interviews, telephone interviews, longitudinal studies, website interceptors, online polls, and systematic observations.

#### Advantages:

- I) Quantitative research allows the researcher to measure and analyze data.
- II) The researcher is more objective about the findings of the research.
- III) Quantitative research can be used to test hypotheses in experiments because of its ability to measure data using statistics.

**Disadvantages :**

- I)The main disadvantage of quantitative research is the context of the study or experiment is ignored.
- II) Quantitative research does not study things in a natural setting or discuss the meaning things have for different people.
- III)A large sample of the population must be studied for more accurate results.

## Differences between qualitative & Quantitative research

	Qualitative	Quantitative
1. Aim	<ul style="list-style-type: none"> <li>1. Exploration of participants' experiences and life world</li> <li>2. Understanding, generating theory from data</li> <li>3. Exploratory</li> </ul>	<ul style="list-style-type: none"> <li>1. Search for causal explanations</li> <li>2. Testing hypothesis, prediction</li> <li>3. Confirmatory</li> </ul>
2. Approach	<ul style="list-style-type: none"> <li>1. Broad focus</li> <li>2. Process oriented</li> <li>3. Context – bound</li> <li>4. Getting close to data</li> </ul>	<ul style="list-style-type: none"> <li>1. Narrow focus</li> <li>2. Product oriented</li> <li>3. Context free</li> <li>4. In artificial or laboratory setting</li> </ul>

Research Aspect	Quantitative	Qualitative
Common Purpose	Test Hypotheses or Specific Research Questions	Discover Ideas, used in Exploratory Research with General Research Objects
Approach	Measure and Test	Observe and Interpret
Data Collection Approach	Structured Response Categories Provided	Unstructure, Free-Form
Research Independence	Researcher Uninvolved Observer. Results Are Objective.	Researcher Is Intimately Involved. Results Are Subjective.
Samples	Large Samples to Produce Generalizable Results	Small Samples – Often in Natural Settings
Most Often Used	Descriptive and Causal Research Designs	Exploratory Research Designs

**G)Structural approach & Unstructured approach:2017/S**

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.

**H)Conceptual research :2016/F,2017/S**

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. Conceptual research focuses on the concept or theory that explains or describes the phenomenon being studied. What causes disease? How can we describe the motions of the planets? What are the building blocks of matter? The conceptual researcher sits at his desk with pen in hand and tries to solve these problems by thinking about them. He does no experiments but may make use of observations by others, since this is the mass of data that he is trying to make sense of.

**I)Empirical /Experimental Research : 2016/F,2017/S**

Empirical research is research using empirical evidence. It is a way of gaining people by means of direct and indirect observation or experience. Empiricism values such research more than other kinds. Empirical evidence (the record of one's direct observations or experiences) can be analyzed quantitatively or qualitatively. 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 are considered as one of the most powerful evidences for a given hypothesis.

## CONCEPTUAL RESEARCH    EMPIRICAL RESEARCH

- |  |  |
|--|--|
| <ol style="list-style-type: none"> <li><b>1. Research related to some abstract idea or theory generally used by philosophers and thinkers to develop new concepts or to reinterpret existing ones.</b></li> <br/> <li><b>2. The researcher breaks down a theorem or concept into its constituent parts to gain a better &amp; deeper understanding of the issue concerning the theorem. Conceptual research is a useful method but should be used in conjunction with other methods to produce better &amp; understandable results.</b></li> </ol> | <ol style="list-style-type: none"> <li><b>1. Research done on experience or observation alone, without due regard for system and theory. It is also called <b>Experimental research</b> as the conclusions can be verified by observation or experiment.</b></li> <br/> <li><b>2. The researcher provides himself with a working hypothesis to get the probable results. Facts are found to prove or disprove the hypothesis after which <b>experimental designs</b> are made to bring forth the desired information.</b></li> </ol> |
|--|--|

### **J)Correlational Research : 2017/F,2017/S**

Correlational research refers to the systematic investigation or statistical study of relationships among two or more variables, without necessarily determining cause and effect. It seeks to establish a relation/association/correlation between two or more variables that do not readily lend themselves to experimental manipulation.

For example, to test the hypothesis “Listening to music lowers blood pressure levels” there are 2 ways of conducting research.

Experimental – group samples and make one group listen to music and then compare the blood pressure levels.

Survey – ask people how they feel ?How often they listen? And then compare.

#### **Advantages:**

- 1) Can collect much information from many subjects at one time.
- 2) Can study a wide range of variables and their interrelations.
- 3) Study variables that are not easily produced in the laboratory.

#### **Disadvantages:**

- 1) Correlation does not indicate causation (cause and effect).
- 2) Problems with self-report method.

### **K)Exploratory research :2017/F,2017/S**

Exploratory research is a type of research conducted for a problem that has not been clearly defined. Exploratory research helps determine the best research design, data collection method and selection of subjects. The results of exploratory research are not usually useful for decision-making by themselves, but they can provide significant insight into a given situation.

Exploratory research is not typically generalizable to the population at large.

Exploratory research can be quite informal, relying on secondary research such as reviewing available literature and/or data or qualitative approaches such as informal discussions with consumers, employees, management or competitors and more formal

approaches through in-depth interviews, focus groups, projective methods, case studies or pilot studies.

Exploratory research is non-experimental or "observational study. In other words, you aren't manipulating any of the variables, you are simply "observing" them. In such studies we study "explore" relationships, without manipulating variables. The basic purpose of exploratory research is to provide information to assist in research to gain knowledge and to understand of the problems .

### **L)Explanatory Research:2017/F,2017/S**

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

Examples:

- Identifying the variables that explain why some cities have higher crime rates than others.
- why some people attend church while others don't .

Explanatory study is to obtain information about the link between the causes and results of the evidence.Explanatory research is research conducted in order to explain any behaviour in the market. It could be done through using questionnaires, group discussions, interviews, random sampling, etc. the primary goal is to understand the nature or mechanisms of the relationship between the independent and dependent variables."where the experimentor attempt to identify cause and effect" (Dr. Amjad Ali Arain).The basic purpose of exploratory research is to provide information to assist in research to gain knowledge and to understand of the problems.Explanatory study is to obtain information about the link between the causes and results of the evidence.

### **M)Historical Research :2017/S**

Historical research is research involving analysis of events that occurred in the remote or recent past.Historical research gives a social scientist a better context for making realistic decisions.

#### **Application:**

-Historical research can show patterns that occurred in the past and over time which can help us to see where we came from and what kinds of solutions we have used in the past.

-Understanding this can add perspective on how we examine current events and educational practices.

#### **The steps involved in the conduct of historical research:**

Here are the five steps:

1. Identification of the research topic and formulation of the research problem or question.
2. Data collection or literature review
3. Evaluation of materials
4. Data synthesis
5. Report preparation or preparation of the narrative exposition

**Strengths :**

- Provides a comprehensive picture of historical trends.
- Uses existing information.
- Provides evidence of on-going trends and problems.

**Limitations :**

- Time-consuming.
- Resources may be hard to locate.
- Resources may be conflicting.
- May not identify cause of a problem.
- Information may be incomplete, obsolete, inconclusive, or inaccurate.
- Data restricted to what already exists.

### **1.3 RESEARCH LEVEL :2014/S,2016/F**

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 levels of research are often defined 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 it exists around us. Description refers to the procedures used to define, classify and categorize subjects and their relationships. Descriptions allow us to establish generalizations and universals. Researchers are interested in describing only things that are relevant to the study. They have no interest in describing observations that are irrelevant to the investigation.

**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:**

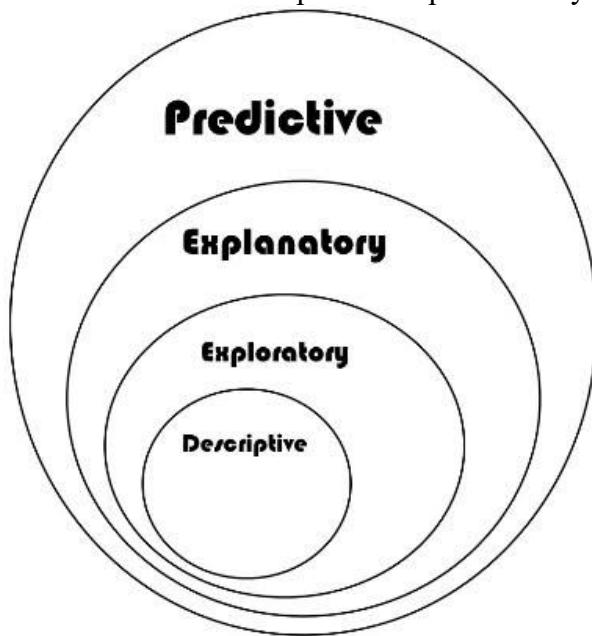
Higher than the second level, as to seeking explanation of the similarities and dissimilarities of the phenomena. Arguably, the most important goal of scientific research is explanation. Explanation is achieved when the cause or causes of a phenomenon are identified. In order to determine cause and effect three pre-requisites are essential: covariation of events, proper time-order sequence and the elimination of plausible alternative causes.

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:**

It is highest level of research. Using established theories and models, the researcher is expected to predict a phenomenon or variable on the bodies of another. In addition to developing descriptions, researchers make predictions. Descriptions of events often provide a basis for prediction. Predictions are sometimes made in the form of hypotheses, which are tentative, testable predictions concerning the relationships

between or among variables. Hypotheses are frequently derived from theories, or interrelated sets of concepts that explain a body of data and make predictions.



## **1.4 Research Objectives :2014/S**

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.

### **A)Broad objective:**

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

#### **Example:**

To determine the factors associated with increased number of diarrhea cases among under fives in X village.

### **B)Specific objective:**

- 1)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.
- 2)other relevant small specific targets to be achieved in conjunction with the broad objective of the research.

#### **Example:**

- A)To find out methods used for excreta disposal.
- B)To find out methods used for water treatment.

C)To determine the feeding habits of the under fives.

**Qualities of specific objectives:**

1. Stated in logical sequence
2. Clear and unambiguous
3. Specific
4. Measurable-Can be evaluated
5. Time bound
6. Realistic
7. Attainable

**1.5 GOALS: 2015/S**

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

- 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.

**1.6 Differentiate between research questions and research objectives. 2015/F**

Research questions are main broad questions and may be complemented by a few investigative questions.They must be fact-oriented,information-gathering questions, capable of being confirmed or refuted.The research question defines the “area of interest” but it is not a declarative statement like a hypothesis.Research objectives are statements of intention or actions intended.Objectives may be specified in the form of actions (verbs) to answer the posed questions.Generally objectives begin with to:discover, determine,establish,access,identify,compare, analyze,evaluate.

**Research Questions (RQ):**

A clear research statement or problem must translate into a research question.

Research question to be fact-oriented,information-gathering question.Research question must be capable of being confirmed

**Example - Single question**

Which methods and tools should be developed to make current manufacturing control / supervision systems reusable and swiftly modifiable?

**Example - Multiple questions**

“Q1:What are the main components of logistics costs that determine the logistics and transport network design?

Q2:To what extent are the existing network design and evaluation models sufficient and how can collaboration be incorporated in the network design methodology?

Q3: How can economies of scale and scope, present in the network,be taken into account in the network design?

Q4: Is it possible to set boundaries to the development path of the network, and search for a feasible path instead of searching solely for a feasible solution? “

**Research objectives (RO):**

Research objectives are the specific actions/activities to answer the research questions.Objectives indicate what we are trying to get from the study or the expected results /outcome of the study.Research objectives should be clear,achievable and verifiable -as they directly assist in answering the research questions / problem . Objectives may be specified in the form of actions (verbs) to answer the posed questions-generally objectives begin with to :discover , determine , establish access..., identify, compare .., analyze , evaluate..,etc.

**Example:**

RQ 1 To what extent host culture is showing changes in adopting immigrant's culture and values.

RO 1 To find out whether the second and subsequent generation of Indian settlers exhibit similar behavior of the first generation of Indian settlers.

**Research Question:**

**What should be the retail price for product X?**

**What type of cosmetics do men use to look handsome?**

**Why Amity's cafeteria is criticized so badly?**

**Research Objectives:**

**Forecast sales for product X at three different prices.**

**To determine the competition & mkt share**

**Determine factors affecting the earnings of cafeteria at Amity**

# Chapter : 6

## 6 Hours

### 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
- III) Primary vs Secondary

#### **A) Primary Vs Secondary Data: 2016/S**

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.

Sr. No	Points	Primary Data	Secondary Data
1.	Meaning	Data collected by researcher himself	Data collected by other persons.
2.	Originality	Original or unique information	Not original or unique information.
3.	Adjustment	Doesn't need adjustment, is focused	Needs adjustment to suit actual aim.
4.	Sources	Surveys, observations, experiments	Internal records, Govt. published data, etc.
5.	Type of data	Qualitative data	Quantitative data
6.	Methods	Observation, experiment, interview	Desk research method, searching online, etc.
7.	Reliability	More reliable	Less reliable
8.	Time consumed	More time consuming	Less time consuming
9.	Need of investigators	Needs team of trained investigators	Doesn't need team of investigators
10.	Cost effectiveness	Costly	Economical
11.	Collected when	Secondary data is inadequate	Before primary data is collected
12.	Capability	More capable to solve a problem	Less capable to solve a problem
13.	Suitability	Most suitable to achieve objective	May or may not be suitable
14.	Bias	Possibility of bias exist	Somewhat safe from bias
15.	Collected by	Researcher or his agents	Persons other than who collects primary data
16.	Precaution to use	Not Necessary	Quite necessary

**Sources of Primary Data**

- **survey**
  - Person
  - Telephone
  - Mail
- **Observation**
  - Personal observation
  - Mechanical observation
- **Experimental**
  - Laboratory experiment
  - Field experiment

**Sources of Secondary Data**

- Library
- Government
- Trade, Professional and Business
- Private Business Firm
- Advertising Media
- University Research Organizations

**Methods of Primary Data Collection:2017/S****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. Examples:

- *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.

**Data collection in survey method : 2015/S,2015/F**

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:2016/F**

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 Wiley & 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 on 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.
- **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 Questions 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 Questions.Which respondents will enjoy answering
- If combined questionnaire,keep open ended Questions for the end.
- Make Questions as interesting as possible and easy to follow by varying type and length of question
- Group the questions 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 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 than 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) Ethical issues relating to the researcher:**

### **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 ethical 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 but 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:2014/S,2015/F**

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
  - : 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

**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

**Tabulation** 2017/F– 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 analyzed 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:**

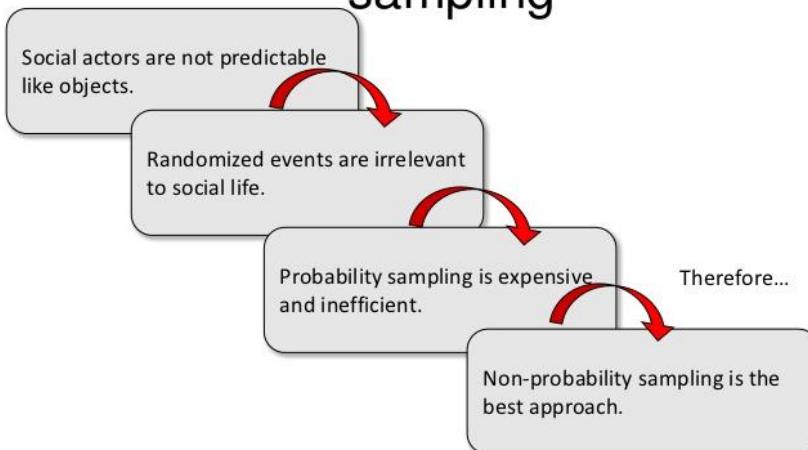
If you want to analyses data using computer, you should be familiar with the appropriate program. In this area, knowledge of computer and statistics plays an important role. The most common software is SPSS for windows. However, data input can be long and laborious process, and if data is entered incorrectly, it will influence the final results.

### **1.1 Distinguish between probability sampling and non probability sampling. Mention the assumptions of a probability sampling. 2016/S,2015/F**

=

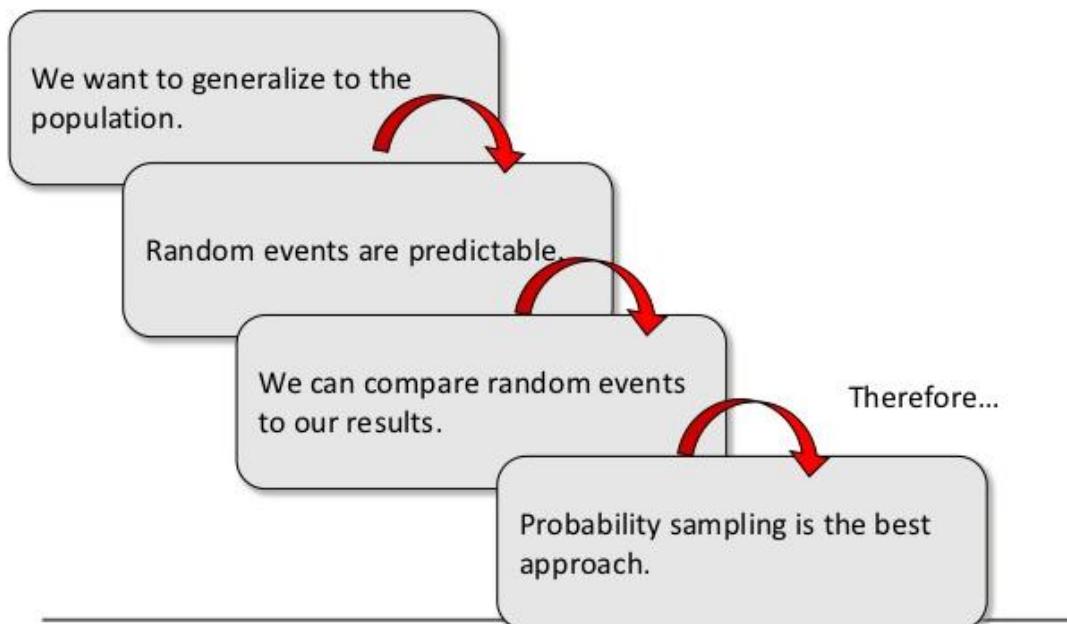
Key	Probability Sampling	Non-Probability Sampling
Meaning	Probability sampling is a sampling technique, in which the subjects of the population get an equal opportunity to be selected as a representative sample.	Nonprobability sampling is a method of sampling wherein, it is not known that which individual from the population will be selected as a sample.
Alternately known as	Random sampling	Non-random sampling
Basis of selection	Randomly	Arbitrarily
Opportunity of selection	Fixed and known	Not specified and unknown
Research	Conclusive	Exploratory
Result	Unbiased	Biased
Method	Objective	Subjective
Inferences	Statistical	Analytical
Hypothesis	Tested	Generated

## Assumptions of qualitative sampling



Type of Sampling Method	Advantages	Disadvantages
<b>Probability</b>	<p>Less prone to bias</p> <p>Calculation of sampling error is possible, from which one can determine statistical significance</p>	<p>Requires list of all elements</p> <p>Time consuming and costly</p> <p>No advantage with small numbers</p>
<b>Non-Probability</b>	<p>Flexible</p> <p>Quicker and cheaper</p> <p>Judgmentally representative samples preferred with small sample sizes</p>	<p>Greater bias risk</p> <p>May not be possible to generalize findings</p> <p>Subjectivity can make it difficult to measure changes over time</p> <p>No way to assess precision or reliability of data</p>

# Assumptions of quantitative sampling



## 1.2 Processing of data implies editing, coding, classification and tabulation". Describe in brief these four operations pointing out the significance of each in context of research study. 2016/S

After collecting data, the method of converting raw data into meaningful statement; includes data processing, data analysis, and data interpretation and presentation. Data reduction or processing mainly involves various manipulations necessary for preparing the data for analysis. The process (of manipulation) could be manual or electronic. It involves editing, categorizing the open-ended questions, coding, computerization and preparation of tables and diagrams.

### A) Editing data:

Information gathered during data collection may lack uniformity. Example: Data collected through questionnaire and schedules may have answers which may not be ticked at proper places, or some questions may be left unanswered. Sometimes information may be given in a form which needs reconstruction in a category designed for analysis, e.g. converting daily/monthly income in annual income and so on. The researcher has to take a decision as to how to edit it.

Editing also needs that data are relevant and appropriate and errors are modified. Occasionally, the investigator makes a mistake and records an impossible answer. "How much red chilies do you use in a month?" The answer is written as "4 kilos". Can a family of three members use four kilo chilies in a month? The correct answer could be "0.4 kilo".

Care should be taken in editing (re-arranging) answers to open-ended questions. **Example:** Sometimes "don't know" answer is edited as "no response". This is wrong. "Don't know" means that the respondent is not sure and is in a double mind about his

reaction or considers the questions personal and does not want to answer it.“No response” means that the respondent is not familiar with the situation/event/object /individual about which he is asked.

### B)Coding of data:

Coding is translating answers into numerical values or assigning numbers to the various categories of a variable to be used in data analysis.Coding is done by using a code book,code sheet and a computer card.Coding is done on the basis of the instructions given in the codebook.The code book gives a numerical code for each variable.

Now-a-days,codes are assigned before going to the field while constructing the questionnaire/schedule.Pose data collection;pre-coded items are fed to the computer for processing and analysis. For open-ended questions, however,post-coding is necessary.In such cases,all answers to open-ended questions are placed in categories and each category is assigned a code.

Manual processing is employed when qualitative methods are used or when in quantitative studies,a small sample is used,or when the questionnaire/schedule has a large number of open-ended questions,or when accessibility to computers is difficult or inappropriate.However,coding is done in manual processing also.

### C)Data classification/distribution:

Sarantakos (1998: 343) defines distribution of data as a form of classification of scores obtained for the various categories or a particular variable.There are four types of distributions:

1. Frequency distribution
2. Percentage distribution
3. Cumulative distribution
4. Statistical distributions

#### Frequency distribution:

In social science research, frequency distribution is very common.It presents the frequency of occurrences of certain categories.This distribution appears in two forms:

**Ungrouped:** Here, the scores are not collapsed into categories, e.g distribution of ages of the students of a BJ (MC) class,each age value (e.g., 18, 19, 20, and so on) will be presented separately in the distribution.

**Grouped:** Here, the scores are collapsed into categories, so that 2 or 3 scores are presented together as a group. For example,in the above age distribution groups like 18-20, 21-22 etc can be formed)

#### Percentage distribution:

It is also possible to give frequencies not in absolute numbers but in percentages.For instance instead of saying 200 respondents of total 2000 had a monthly income of less than Rs. 500,we can say 10% of the respondents have a monthly income of less than Rs. 500.

#### Cumulative distribution:

It tells how often the value of the random variable is less than or equal to a particular

reference value.

**Statistical data distribution:**

In this type of data distribution,some measure of average is found out of a sample of respondents.Several kind of averages are available (mean, median, mode) and the researcher must decide which is most suitable to his purpose.Once the average has been calculated, the question arises:how representative a figure it is, i.e how closely the answers are bunched around it.Are most of them very close to it or is there a wide range of variation?

**D)Tabulation of data:2017/F**

After editing, which ensures that the information on the schedule is accurate and categorized in a suitable form,the data are put together in some kinds of tables and may also undergo some other forms of statistical analysis.Table can be prepared manually and/or by computers.For a small study of 100 to 200 persons, there may be little point in tabulating by computer since this necessitates putting the data on punched cards.But for a survey analysis involving a large number of respondents and requiring cross tabulation involving more than two variables,hand tabulation will be inappropriate and time consuming.

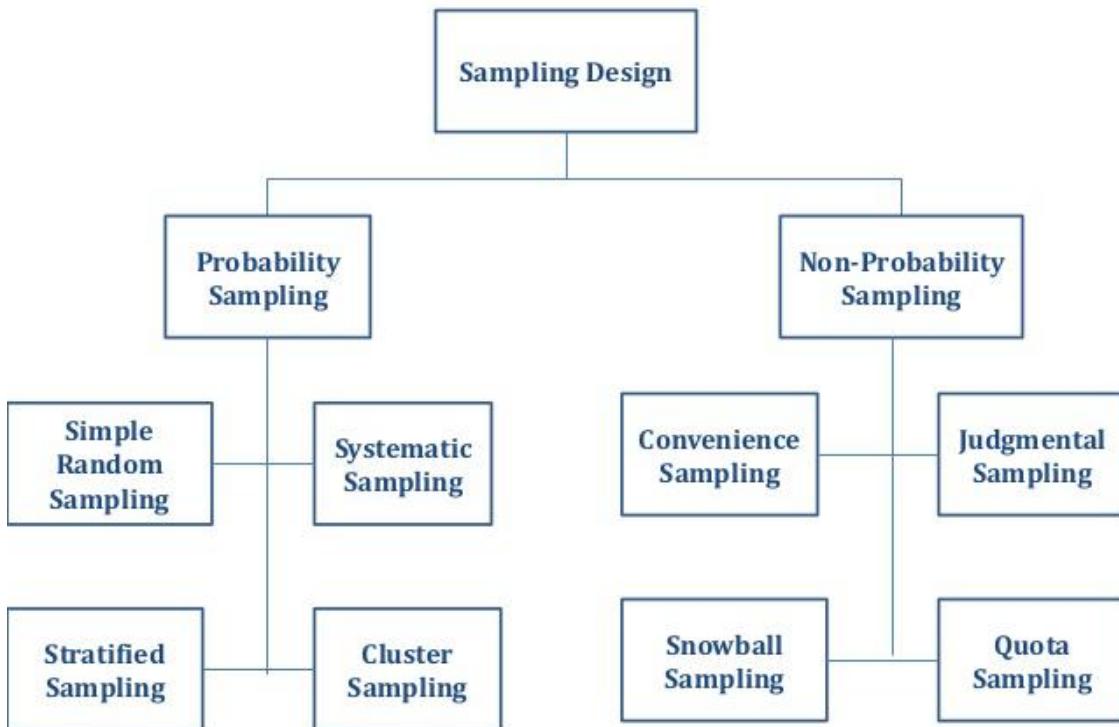
**Usefulness of tables:**

Tables are useful to the researchers and the readers in three ways:

1. They present an overall view of findings in a simpler way.
  2. They identify trends.
  3. They display relationships in a comparable way between parts of the findings.
- By convention,the dependent variable is presented in the rows and the independent variable in the columns.

**1.3 What do you mean by ‘Sample Design’? What points should be taken into consideration by a researcher in developing a sample design for the research project. 2016/S**

A sample design is the framework, or road map, that serves as the basis for the selection of a survey sample and affects many other important aspects of a survey as well. In a broad context,survey researchers are interested in obtaining some type of information through a survey for some population, or universe,of interest. One must define a sampling frame that represents the population of interest,from which a sample is to be drawn.



Points that should be taken into consideration by a researcher in developing a sample design for the research project are:

#### **i) Type of universe:**

The first step in developing any sample design is to clearly define the set of objects, technically called the Universe, to be studied. The universe can be finite or infinite. In finite universe the number of items is certain, but in case of an infinite universe the number of items is infinite, the population of a city, the number of workers in a factory and the like are examples of finite universes, whereas the number of stars in the sky, listeners of a specific radio programme, throwing of a dice etc. are infinite universes.

#### **(ii) Sampling unit:**

A decision has to be taken concerning a sampling unit before selecting sample. Sampling unit may be a geographical one such as state, district, village etc or a construction unit such as house, flat etc or it may be a social unit such as family, club, school etc or it may be an individual. The researcher will have to decide one or more of such units that he has to select for his study.

#### **(iii) Source list:**

It is also known as ‘sampling frame’ from which sample is to be drawn. It contains the names of all items of a universe (in case of finite universe only). If source list is not available, researcher has to prepare it. Such a list should be comprehensive, correct, reliable and appropriate. It is extremely important for the source list to be as representative of the population as possible.

#### **(iv) Size of sample:**

This refers to the number of items to be selected from the universe to constitute a sample. The size of sample should neither be excessively large, nor too small. It

should be optimum, which fulfills the requirements of efficiency, representativeness, reliability and flexibility. Costs too dictate the size of sample. As such, budgetary constraint must invariably be taken into consideration when we decide the sample size.

**(v) Parameters of interest:**

In determining the sample design, one must consider the question of the specific population parameters which are of interest. For instance, we may be interested in estimating the proportion of persons with some characteristic in the population. There may be important sub-groups in the population about whom we would like to make estimates. All this has a strong impact upon the sample design we would accept.

**(vi) Budgetary constraint:**

Cost considerations, from practical point of view, have a major impact upon decisions relating to not only the size of the sample but also to the type of sample. This fact can even lead to the use of a non-probability sample.

**(vii) Sampling procedure:**

Finally, the researcher must decide the type of sample he will use i.e. he must decide about the technique to be used in selecting the items for the sample. There are several sample designs out of which the researcher must choose one for his study. He must select that design which, for a given sample size and for a given cost, has a smaller sampling error.

**1.3 What are the goals and purposes of data analysis in research? Discuss any three quantitative data analysis tools in detail. 2015/S**

Data analysis is a process of applying statistical practices to organize, represent, describe, evaluate and interpret data.

There are many benefits of data analysis however, the most important ones are as follows: data analysis helps in structuring the findings from different sources of data collection like survey research. It is again very helpful in breaking a macro problem into micro parts. Data analysis acts like a filter when it comes to acquiring meaningful insights out of huge data-set. Every researcher has sort out huge pile of data that he/she has collected, before reaching to a conclusion of the research question. Mere data collection is of no use to the researcher. Data analysis proves to be crucial in this process. It provides a meaningful base to critical decisions. It helps to create a complete dissertation proposal.

One of the most important uses of data analysis is that it helps in keeping human bias away from research conclusion with the help of proper statistical treatment. With the help of data analysis a researcher can filter both qualitative and quantitative data for an assignment writing projects. Thus, it can be said that data analysis is of utmost importance for both the research and the researcher. Or to put it in another words data analysis is as important to a researcher as it is important for a doctor to diagnose the problem of the patient before giving him any treatment.

**Purposes :** To answer the research questions and to help determine the trends and relationships among the variables.

**Three quantitative data analysis tools are:****STATISTICAL PACKAGE FOR SOCIAL SCIENCE (SPSS):**

SPSS is the most popular quantitative analysis software program used by social scientists. Made and sold by IBM, it is comprehensive, flexible, and can be used with almost any type of data file. However, it's especially useful for analyzing large-scale survey data. It can be used to generate tabulated reports, charts and plots of distributions and trends, as well as generate descriptive statistics such as means, medians, modes and frequencies in addition to more complex statistical analyses like regression models.

SPSS provides a user interface that makes it easy and intuitive for all levels of users. With menus and dialogue boxes, you can perform analyses without having to write command syntax, like in other programs. It is also simple and easy to enter and edit data directly into the program. There are a few drawbacks, however, which might not make it the best program for some researchers.

For example, there is a limit on the number of cases you can analyze. It is also difficult to account for weights, strata and group effects with SPSS.

**STATA:**

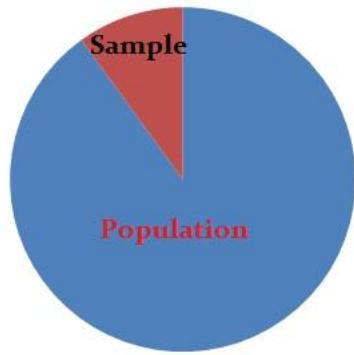
STATA is an interactive data analysis program that runs on a variety of platforms. It can be used for both simple and complex statistical analyses. STATA uses a point-and-click interface as well as command syntax, which makes it easy to use. STATA also makes it simple to generate graphs and plots of data and results. Analysis in STATA is centered around four windows: the command window, review window, result window and variable window. Analysis commands are entered into the command window and the review window records those commands. The variables window lists the variables that are available in the current data set along with the variable labels and the results appear in the results window.

**SAS:**

SAS, short for Statistical Analysis System, is also used by many businesses; in addition to statistical analysis, it also allows programmers to perform report writing, graphics, business planning, forecasting, quality improvement, project management and more. SAS is a great program for the intermediate and advanced user because it is very powerful; it can be used with extremely large data sets and can perform complex and advanced analyses. SAS is good for analyses that require you to take into account weights, strata or groups. Unlike SPSS and STATA, SAS is run largely by programming syntax rather than point-and-click menus, so some knowledge of the programming language is required.

**1.4 Define sampling. Briefly describe the probability sampling with appropriate examples. 2015/S, 2014/S**

**Sampling** is the process of selecting units (e.g. people, organizations) from a population of interest so that by studying the sample we may fairly generalize our results back to the population from which they were chosen.



Probability sampling is a sampling technique wherein the samples are gathered in a process that gives all the individuals in the population equal chances of being selected. In this sampling technique, the researcher must guarantee that every individual has an equal opportunity for selection and this can be achieved if the researcher utilizes randomization.

#### **Types of Probability Sampling:**

I) **Simple random sampling** is a completely random method of selecting subjects. These can include assigning numbers to all subjects and then using a random number generator to choose random numbers. Classic ball and urn experiments are another example of this process (assuming the balls are sufficiently mixed). The members whose numbers are chosen are included in the sample.

II) **Stratified Random Sampling** involves splitting subjects into mutually exclusive groups and then using simple random sampling to choose members from groups.

III) **Systematic Sampling** means that you choose every “nth” participant from a complete list. For example, you could choose every 10th person listed.

IV) **Cluster Random Sampling** is a way to randomly select participants from a list that is too large for simple random sampling. For example, if you wanted to choose 1000 participants from the entire population of the U.S. it is likely impossible to get a complete list of everyone. Instead, the researcher randomly selects areas (i.e. cities or counties) and randomly selects from within those boundaries.

V) **Multi-Stage Random sampling** uses a combination of techniques.

#### **Advantages:**

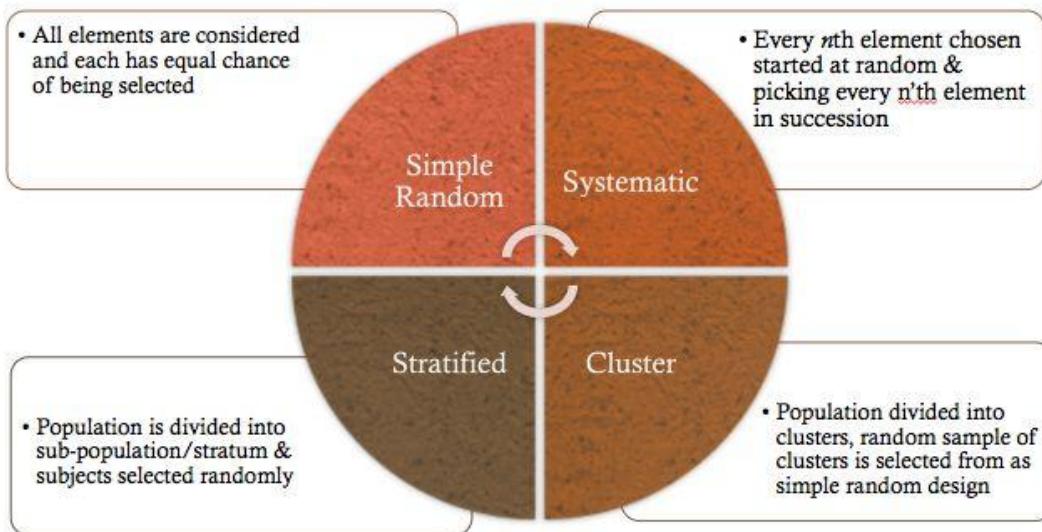
- Cluster sampling: convenience and ease of use.
- Simple random sampling: creates samples that are highly representative of the population.
- Stratified random sampling: creates strata or layers that are highly representative of strata or layers in the population.
- Systematic sampling: creates samples that are highly representative of the population, without the need for a random number generator.

#### **Disadvantages:**

- Cluster sampling: might not work well if unit members are not homogeneous (i.e. if they are different from each other).

- Simple random sampling: tedious and time consuming, especially when creating larger samples.
- Stratified random sampling: tedious and time consuming, especially when creating larger samples.
- Systematic sampling: not as random as simple random sampling.

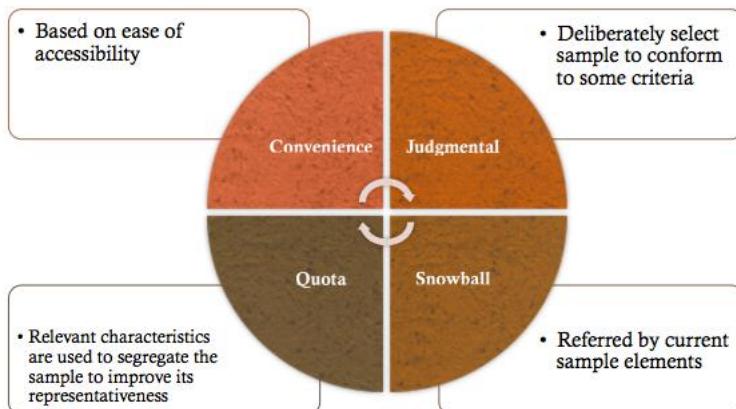
## Probability Sampling



### 1.5 Define Population. Describe non Probability Sampling and Describe Probability Sampling.2014/S,2016/F

=**Population** is the broader group of people to whom you intend to generalize the results of your study. Sample will always be a subset of your population. Exact population will depend on the scope of your study. For instance, say your research question asks if there is an association between emotional intelligence and job satisfaction in nurses. In this case, your population might be nurses in the Nepal. However, if the scope of your study is more narrow (e.g. if your study deals with a local problem or a specific specialty/industry), then your population would be more specific, such as “nurses in the Kathmandu” or “licensed practical nurses in the Nepal.” Importantly, your population should only include people to whom your results will apply.

# Non-Probability Methods



Probability (Random) Sampling	Non-Probability (Non-Random) Sampling
<ul style="list-style-type: none"> <li>You can generalize to the population defined by the sampling frame</li> </ul>	<ul style="list-style-type: none"> <li>You cannot generalize beyond the sample</li> </ul>
<ul style="list-style-type: none"> <li>Allows use of statistics, tests hypotheses</li> </ul>	<ul style="list-style-type: none"> <li>Exploratory research, generates hypotheses</li> </ul>
<ul style="list-style-type: none"> <li>Can estimate population parameters</li> </ul>	<ul style="list-style-type: none"> <li>Population parameters are not of interest</li> </ul>
<ul style="list-style-type: none"> <li>Eliminates bias</li> </ul>	<ul style="list-style-type: none"> <li>Adequacy of the sample can't be known</li> </ul>
<ul style="list-style-type: none"> <li>Must have random selection of units</li> </ul>	<ul style="list-style-type: none"> <li>Cheaper, easier, quicker to carry out</li> </ul>

## Types of Non-Probability Sampling

**1)Convenience Sampling:** as the name suggests, this involves collecting a sample from somewhere convenient to you:the mall,your local school,your church.Sometimes called accidental sampling, opportunity sampling or grab sampling.

**2)Haphazard Sampling:** where a researcher chooses items haphazardly, trying to simulate randomness.However, the result may not be random at all and is often tainted by selection bias.

**3)Purposive Sampling:** where the researcher chooses a sample based on their knowledge about the population and the study itself. The study participants are chosen based on the study's purpose.There are several types of purposive sampling.

**4)Expert Sampling:** in this method,the researcher draws the sample from a list of experts in the field.

**5) Heterogeneity Sampling / Diversity Sampling:** a type of sampling where you deliberately choose members so that all views are represented. However, those views may or may not be represented proportionally.

**6) Modal Instance Sampling:** The most “typical” members are chosen from a set.

**7) Quota Sampling:** where the groups (i.e. men and women) in the sample are proportional to the groups in the population.

**8) Snowball Sampling:** where research participants recruit other members for the study. This method is particularly useful when participants might be hard to find. For example, a study on working prostitutes or current heroin users.

### **1.6 Define Data? What are the merits and demerits of Primary and Secondary Data? 2014/S, 2016/F**

**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.

#### **merits of Primary data:**

- (i) Degree of accuracy is quite high.
- (ii) It does not require extra caution.
- (iii) It depicts the data in great detail.
- (iv) Primary source of data collection frequently includes definitions of various units used.
- (v) For some investigations, secondary data are not available.

#### **Demerits:**

- (i) Collection of data requires a lot of time.
- (ii) It requires lot of finance.
- (iii) In some inquiries it is not possible to collect primary data.
- (iv) It requires a lot of labor.
- (v) It requires a lot of skill.

#### **Merits of secondary data :**

- (i) Use of secondary data is very convenient.
- (ii) It saves time and finance.
- (iii) In some enquiries primary data cannot be collected.
- (iv) Reliable secondary data are generally available for many investigations.

#### **Demerits:**

- (i) It is very difficult to find sufficiently accurate secondary data.
- (ii) It is very difficult to find secondary data which exactly fulfills the need of present investigation.
- (iii) Extra caution is required to use secondary data.
- (iv) These are not available for all types of inquiries.

## Benefits of Secondary Data

- Easily accessible
- Relatively inexpensive
- Obtained quickly
- Sometimes more accurate than primary data
- Some information is only available from secondary sources (e.g., population of the country)
- Enhances existing primary data
- Familiarise the researcher with the industry
- Identify concepts, data and terminology

1.7 What are the advantages and disadvantages of using questionnaire ?2015/F

### ADVANTAGES

- Large number of respondents possible.
- Representative sample possible.
- Question responses can be highly structured and easily coded.
- Statistical tests possible (depending on nature of data collected).
- Respondent has time to consider questions (especially so when not face to face).
- Inexpensive way to cover a large geographical area.
- Questionnaires are replicable and can be used in later studies and, if well constructed and properly piloted, they should be reliable.
- Standardised questionnaires have already been validated; you can compare your work directly to other studies.

## **DISADVANTAGES**

- **If not administered face to face, (eg by email attachment or on-line) there is a possibility of a low response rate (not getting many questionnaires back)**
- **No way of knowing how representative people are in some website/Internet-based surveys (that is, it depends on whether people can access a website)**
- **Questions cannot be explained to respondents and can be misinterpreted (unless administered face-to-face) and answers cannot be put in any real world context**
- **Questionnaires cannot tell us about context and meaning behind a response**
- **Likelihood of socially desirable responses to certain questions.**

### **1.7 Significance of Sampling : 2015/F**

In the Research Methodology, practical formulation of the research is very much important and so should be done very carefully with proper concentration and in the presence of a very good guidance.

But during the formulation of the research on the practical grounds, one tends to go through a large number of problems. These problems are generally related to the knowing of the features of the universe or the population on the basis of studying the characteristics of the specific part or some portion, generally called as the sample. So now sampling can be defined as the method or the technique consisting of selection for the study of the so called part or the portion or the sample, with a view to draw conclusions or the solutions about the universe or the population.

According to Mildred Parton, "Sampling method is the process or the method of drawing a definite number of the individuals, cases or the observations from a particular universe, selecting part of a total group for investigation."

Basic Principles of Sampling :

Theory of sampling is based on the following laws-

- **Law of Statistical Regularity** – This law comes from the mathematical theory of probability. According to King, " Law of Statistical Regularity says that a moderately

large number of the items chosen at random from the large group are almost sure on the average to possess the features of the large group.”

According to this law the units of the sample must be selected at random.

- **Law of Inertia of Large Numbers** – According to this law, the other things being equal – the larger the size of the sample; the more accurate the results are likely to be.

#### **Advantages of sampling:**

1. Very accurate.
2. Economical in nature.
3. Very reliable.
4. High suitability ratio towards the different surveys.
5. Takes less time.
6. In cases, when the universe is very large, then the sampling method is the only practical method for collecting the data.

#### **Disadvantages of sampling:**

1. Inadequacy of the samples.
2. Chances for bias.
3. Problems of accuracy.
4. Difficulty of getting the representative sample.
5. Untrained manpower.
6. Absence of the informants.
7. Chances of committing the errors in sampling.

#### **1.8 What do you mean by sample size ?Differentiate systematic and stratified sampling.Why probability sampling is generally preferred in comparison to non probability sampling ? 2017/F**

The sample size of a survey most typically refers to the number of units that were chosen from which data were gathered. However, sample size can be defined in various ways. There is the designated sample size, which is the number of sample units selected for contact or data collection. There is also the final sample size, which is the number of completed interviews or units for which data are actually collected. The final sample size may be much smaller than the designated sample size if there is considerable non response, ineligibility or both.

- This is the **sub-population** to be studied in order to make an **inference** to a **reference population** (A broader population to which the findings from a study are to be generalized)
- In census, the sample size is equal to the population size. However, in research, because of time constraint and budget, a **representative sample** are normally used.
- The larger the sample size the more accurate the findings from a study.

## **TABLE: COMPARITIVE PERFORMANCE OF VARIOUS RANDOM SAMPLING METHODS**

Method of random sampling	Desired size of target population	Reliability of conclusions for fixed sample size	Economy	Remarks
Simple	Small	Very good	Expensive	Requires full sampling frame
Systematic	Small	Good	Economical	sampling frame not needed but the size of the target population is needed
Stratified	Medium	Good	Expensive	Good for non-homogenous population
Cluster	Large	Poor	Very economical	Very convenient for geographically diverse population
Multi stage	Very large	Medium	economical	Requires sampling frame only for each nested unit

Type	Description	Advantages	Disadvantages
<b>Simple Random Sampling</b> Cost: High Use: Moderate	Each population element has an equal chance of being selected into the sample. Sample drawn using random number table/generator	<ul style="list-style-type: none"> <li>Easy to implement with random dialing</li> </ul>	<ul style="list-style-type: none"> <li>Requires list of population elements</li> <li>Time consuming</li> <li>Larger sample needed</li> <li>Produces larger errors</li> <li>High cost</li> </ul>
<b>Systematic Sampling</b> Cost: Moderate Use: Moderate	Selects and element of the population at the beginning with a random start, and following the sampling skip interval selects every $k$ th element.	<ul style="list-style-type: none"> <li>Simple to design</li> <li>Easier than simple random</li> <li>Easy to determine sampling distribution of mean or proportion</li> </ul>	<ul style="list-style-type: none"> <li>Periodicity within population may skew sample and results</li> <li>Trends in list may bias results</li> </ul>
<b>Stratified Sampling</b> Cost: High Use: Moderate	Divided into subpopulations or strata and uses simple random on each stratum. Results may be weighted or combined	<ul style="list-style-type: none"> <li>Control of sample size in strata</li> <li>Increased statistical efficiency</li> <li>Provides data to represent and analyze subgroups</li> </ul>	<ul style="list-style-type: none"> <li>Increased error if subgroups are selected at different rates</li> <li>Especially expensive if strata on population must be created</li> </ul>

**1.9 List different data collections method. Describe the advantages and possible constraints of different data collection technique. 2016/F,2017/S**

=Summarize :

- I)Observation method
- ii)Contact method
- iii)Experimental method

## 2.0 Difference between Qualitative and quantitative data Analysis.

Criteria	Qualitative	Quantitative
Purpose	Understand and interpret social interactions	Test hypotheses, check the cause and effect. Develop predictions for the future
Studied group	Small, selected intentionally	Larger and selected randomly
Data type	Words, images, objects	Numbers and statistics
Data form	Open-ended responses, interviews, participant observations, field notes	Precise measurements using structures and validated instruments for data collection.
Type of data analysis	Patterns, features, themes identification.	Statistical relationships identification
Researcher's role	Researcher may be known to participants in the study and participants's characteristics may be known to the researchers.	Researcher and their biases are not known to the participants in the study. Participant characteristics are hidden.
Results	Particular findings, less generalizable	Generalizable findings, can be applied to the other populations.

## 2.1 Difference Between Primary and Secondary Data.

BASIS FOR COMPARISON	PRIMARY DATA	SECONDARY DATA
Meaning	Primary data refers to the first hand data gathered by the researcher himself.	Secondary data means data collected by someone else earlier.
Data	Real time data	Past data
Process	Very involved	Quick and easy
Source	Surveys, observations, experiments, questionnaire, personal interview, etc.	Government publications, websites, books, journal articles, internal records etc.
Cost effectiveness	Expensive	Economical
Collection time	Long	Short
Specific	Always specific to the researcher's needs.	May or may not be specific to the researcher's need.
Available in	Crude form	Refined form
Accuracy and Reliability	More	Relatively less

## 2.2 What is a questionnaire? Explain its types. Discuss advantages & disadvantages of questionnaires.

A **questionnaire** is a research instrument consisting of a series of questions (or other types of prompts) for the purpose of gathering information from respondents. The questionnaire was invented by the Statistical Society of London in 1838.

### Types of Questionnaires:

Based on the type of questions used, questionnaires are as follows:

#### 1. Structured questionnaire:

Comes under quantitative research. It includes the low number of researchers and the high number of respondents. They are also called as closed questionnaires. They usually include answers such as very bad, bad, good, very good and so on.

- They have a definite and concrete questions
- They have to be prepared well in advance so as to ask as much questions and receive info from the respondent.
- A formal inquiry is initiated.
- Supplements and checks the previously accumulated data.
- Commonly used in for social and economic problems, to study about the changes caused due to change in policies, laws etc.

#### 2. Unstructured questionnaire:

A version of qualitative survey. They are usually based around more open questions. Open questions also means recording more data as the respondents can point out what is important for them, in their own words and methods. But it is more difficult from the researcher's side, since it does not give the correct idea of the topic and moreover proper understanding of the data is needed.

- Usually used at the time of an interview.
- Doesn't require much planning and time.
- More flexible for applying in many areas.
- Usually used to collect data about people and their personal info such as family, debates, beliefs etc.

#### 3. Scaled questionnaires:

The respondents are asked to scale the answers based on a given rating prescribed by the question. Depending on the type of format used in questionnaires, they are divided into the following.

#### Open format questions:

These are the type of questions that are used to allow the respondents to express their views in a free flowing manner. By using such questions, the respondents do not have to follow the criteria for answering questions and he/she can truly express their beliefs and suggestions. An ideal questionnaire is a type of questionnaire that includes open ended questions and also have feedback and suggestions for future improvements.

#### Closed format questions:

Multiple choice questions comes under this category. The user is restricted to answer their opinions through the options that is set by the surveyor. Hence, these are also called as close ended questions. One of the main advantages of using closed ended questions is the ease of doing preliminary analysis. These are usually used to find

opinion about known questions and answers. They are usually used to track the status and the improvements of organization and companies.

### **Closed ended questions are of various types:**

#### **1. Leading questions:**

These type of questions force a definite type of answer from the audience. In such a question, all kind of answers are equally likely. The answers can vary from bad, very bad to good and very good. These are usually used to collect information from the users in very limited words.

#### **2. Importance questions:**

The respondents are asked to take a rating for a certain type of issue on a scale of 1 to 5. This shows how much of an importance does the questionnaire topics really hold within the company or within the minds of the user.

#### **3. Likert questions:**

These questions show how much the customer agrees to a certain topic and how much it impacts the respondent.

#### **4. Dichotomous questions:**

These questions ask the respondents only a yes or no answer. Hence, it makes it difficult to analyse beyond the yes and no answer.

#### **5. Bipolar questions:**

Such questions have answers that are in the extreme case. The respondents are required to ask to rate the question between these two extremities.

#### **6. Rating scale questions:**

In such questions, the respondents are asked to rate a particular issue between the ratings of good and bad. Such questions have even number of choices, so as to prevent selecting the middle option all the time.

#### **7. Buying propensity questions:**

These questions are used to rate whether the respondent will again use the service or the product in the future.

### **Advantages of Questionnaires:**

1. Questionnaires are really inexpensive when they are handled properly. They can be cheaper than taking surveys which requires a lot of time and money.
2. Questionnaires can be of different types, written, postal, telephone and many other methods.
3. A single question or a topic can be asked to many at the same time without any kind of delay. Unlike surveys they don't have to go to each and everyone to get an opinion.
4. It is an effective method to get an opinion from a large number of people.
5. Large number of respondents can be possible varying in age, sex, occupation etc.
6. Question responses can be highly defined and specific, depending upon the type of questions asked in the questionnaire.
7. These results can also be included as statistical survey, the deciding factor is the nature of the questionnaire and on what topic was the questionnaire based on.

8. Unlike face to face surveys where the respondent has to answer within that moment itself, questionnaires gives time to the respondents to think carefully, before giving the answers.
9. Questionnaires are easily replicable and can be repeated, and if well-constructed and properly piloted, they can be used as comparative materials for future studies and projects.
10. Standardised questionnaires can already be validated and can be used to compare between works and studies.
11. They are easy to administer and manage.
12. These type of data collection are common among all kinds of professions including teaching and book keeping. Questionnaires have become a part of our daily lives.
13. The format for most type of questionnaires are common to the common people irrespective of the status.
14. The most important part in a preliminary survey. Usually taken as a step to collect important data such as feedbacks, suggestions and constructive criticisms.
15. Questionnaires are usually straightforward in their approach which makes them easier to analyse and compare with the ideal answers.
16. Questionnaires provide a lot for data analysis and data manipulation. The more the data that is received, the more accurate will be the analysis.
17. Questionnaires allows people to answer questions when they feel it is convenient. Thus, it is more applicable than face to face surveys where people are expected to immediately reply to the question.
18. If anonymous, more honest answers can be expected from the people being surveyed.
19. Questionnaires can reduce a lot of bias. Since, all the respondents are answering the same number and the same type of questions.
20. Used for getting answers from a large group of people from a short space of time.

### **Disadvantages of Questionnaires:**

1. The results for questionnaires are based only on the type of question being asked. If the questions are poorly worded or is biased in nature, then the result analysed will also be of the same nature.
2. Questionnaires can pose difficulties to the analyst if he/she is not familiar with the system based on which the questions are being asked. That is, the analyst may not be able to produce the required questions and hence the required results cannot be achieved.
3. Questionnaires tend to give an alien feeling to many respondents and hence they are very impersonal irrespective of the situation. Thus, many people do prefer face to face conversations than answering questionnaires.
4. The response rate maybe poor in questionnaires, if people do not have time or they don't feel any importance in answering them. This is one of the main disadvantages of questionnaires.
5. Questionnaires do make it impossible for people to answer questions according to their own opinion. This makes them very constricted in terms of answering such questions. This feels true particularly when the questionnaires have closed end questions. They limit the opinions of the respondent by a huge factor. Hence, less honest and detailed answers can be received.
6. Some participants may forget about the whole issue and tend to forget why such questionnaire was present in the first place.

7. Open ended questions may take a long time and will produce a large amount of data that will take time to analyse.
8. Respondents may answer the questionnaire superficially, if it takes time to answer such questions. This might lead to inadequate and maybe unwanted data to analyse the final result.
9. Do not try to ask too many questions since it might bore the respondent and ultimately it will lead to incorrect answers.
10. Try to make the questionnaire as anonymous as possible as it will be more beneficial for the respondent to explain their opinions in detail.
11. Try to state the respondents for what purpose is the survey being taken and how the questionnaire will be beneficial in the overall process.
12. For a more fruitful approach, try to make sure that the questionnaire is applicable to individuals who are willing to answer and are ready to give a valid answer.
13. If any doubts in the answers, the analyst cannot trace back to the respondents since most of the questionnaires are usually anonymous in nature.
14. Questionnaires can also give the respondents freedom to lie, hence resulting in vague answers or opinions that are distant from the main issue.
15. If not administered face to face, that is through telephone or such incentives, questionnaires can have low response rates.
16. Questionnaires do not explain the questions to the respondents which might lead to misinterpreted answers and facts.
17. Questionnaires cannot inform about the real meaning and fact of why such data is collected. Hence, this means that the respondents do not feel obligated to answer such questionnaires truthfully and specifically. This leads to misinterpretation of data.
18. People can feel biased to certain questions in a questionnaire. This may be due to the fact that the respondent may be penalised when answering such questions truthfully.
19. Questionnaires provide very less stability with the response processes in taking a survey.
20. Questionnaires may not be suitable for certain people. It may not be suitable for illiterates or people who have reading problems.
21. Especially from postal questionnaires, it might be difficult to obtain a certain number of answers within a limited period of time.
22. Respondents may ignore certain questions without giving a proper answer.
23. Questionnaires can be incorrectly filled.
24. They are not suitable for collecting and taking information about long and complex issues.
25. Because of the ambiguous language used, it might be a bit confusing for the respondent to answer such questions.
26. More than 90% of the questions are in printed or in visual format in a written questionnaire. Gestures or other visual clues are not present. This can cause problems to which the questionnaire is being requested to.
27. Too many frequent questionnaires can cause fatigue among the respondent group and can cause misuse of questionnaires and related surveys.
28. Try to have a simple and intuitive questionnaire format. For example, try to line up response boxes on the right side of the questionnaire so that it is easy for the respondent to mark the options.
29. Try to use easy and understandable vocabulary so that the questionnaire can be understood by all groups of people.
30. Try to make the instructions to the respondents as clear as possible.

### 2.3 Ethical issues and human participants in research:

- Researchers must state values and biases in writing reports.
- Researchers must take steps to ensure that accurate accounts of participant perceptions are made (as feasible).
- Researchers have a responsibility to use the data to enhance social change.
- Consent is sometimes obtained through personal interaction with individuals or communities (entry). The researcher must establish trusting relationships.
- Participants may be viewed as partners in the research process and always as the social equal of the researcher.

#### Introduction to ethics in research:

- Ethical concerns will emerge as you plan your research, seek access to organizations and to individuals, collect, analyze and report your data.
- ethics refers to the appropriateness of your behavior in relation to the rights of those who become the subject of your work, or are affected by it.
- The appropriateness or acceptability of our behavior as researchers will be affected by broader social norms of behavior.
- You will therefore need to consider ethical issues throughout the period of your research and to remain sensitive to the impact of your work on those whom you approach to help, those who provide access and co-operation and those whom are affected by your results.
- Researcher need to be sensitive to the way in which the granting of access affects this type of relationship.
- you must accept the responsibility to behave ethically toward those who will be affected by your research
- ethics is the study of proper action
- research ethics concerns the responsibility of researchers to be honest and respectful to all individuals who may be affected by their research studies or their reports of the studies results.

## Ethical Issues Involving Research Participants

Confidentiality	Anonymity	
	YES	NO
YES	Gather data so it is impossible for anyone to link it to any name and release findings in aggregate form.	Privately link details about a specific participant to a name, but only publicly release findings in aggregate form
NO	Release details about a specific participant to the public, but withhold the name and details that might allow someone to trace back to the person.	<b>Unethical</b> Reveal publicly details about a person with his/her name

# **Chapter : 7**

## **Writing Research proposal**

**7 Hours**

### **1.1 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:**

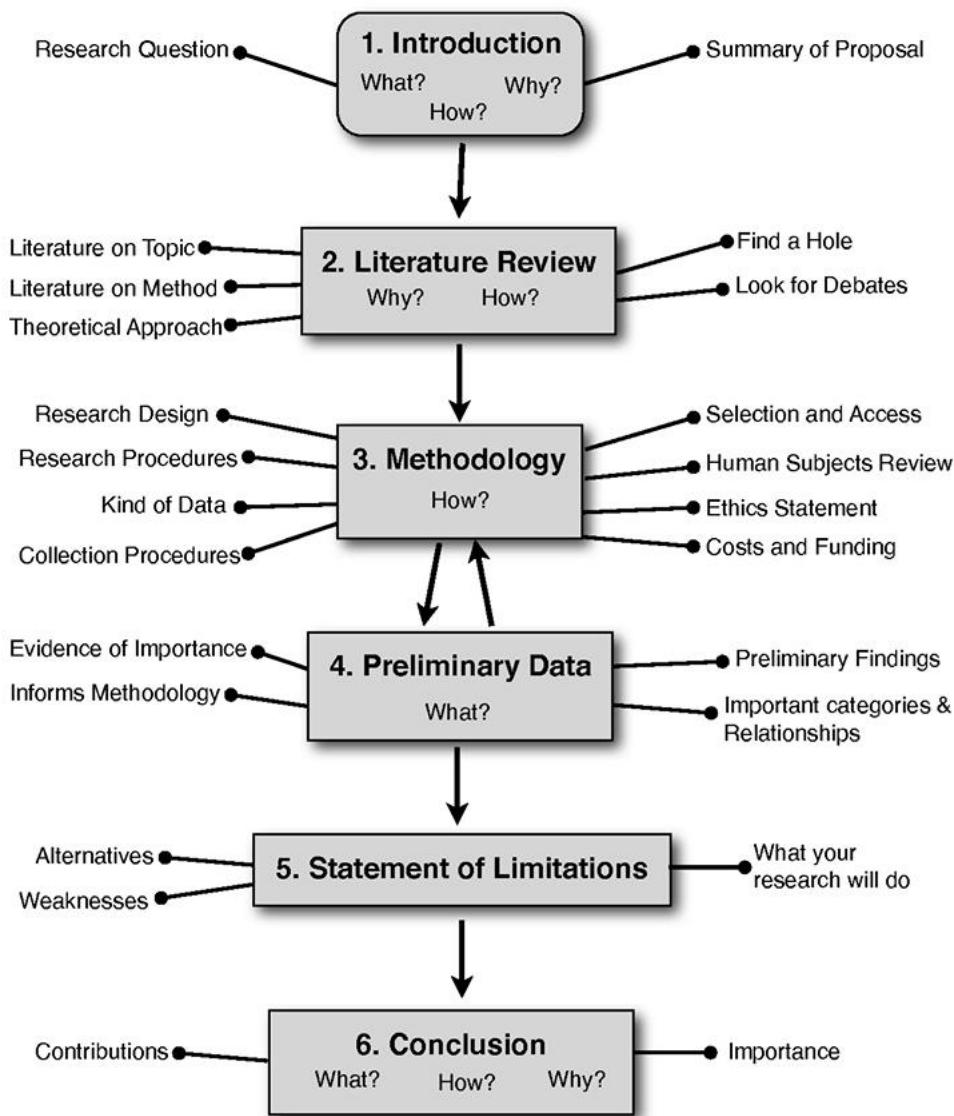
- A problem of our own interest. Such a problem may be suggested by our past experience in business, government agencies or other organizations. Choosing a topic from personal interest is one of the best methods.
- Articles in the newspaper and journals
- Projects works in college libraries, which have 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 estimating 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.

### **Criteria for selecting a Research Topic: 2015/F**

- 1) Interest
- 2) Relevance
- 3) Avoidance of duplications
- 4) Feasibility

- 5) Acceptability
- 6) Applicability
- 7) Cost Effectiveness
- 8) Ethical Considerations

## Research Proposal Flow Chart



### 1.2 Research Proposal: 2014/S,2015/S

- It is the presentation of an idea we wish to pursue. It is an argument for 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?

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

- 1) A means of communication from the researcher to those who will evaluate, 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.

### **1.3 Elements of a Research Proposal: 2015/S,2016/S,2017/S**

Frontal Matter:-Letter of Transmittal, Title( to encapsulate the essence of your research in a few words), Synopsis/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 relevant?
- Motivation statement, how you developed interest in it?
- Relevance of the proposed study
- 1/10<sup>th</sup> of the total length of 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 purpose

**5)Methodology (Research Methods): 2017/F**

- 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:**

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

**ii) Subjects/ Participants:**

- o 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**

- o 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 : 2016/S,2017/S**

- 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.

Eg: 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.

**1.4 What is the purpose of methodology section of the research proposal?What is included in this section ?Why is this section is given high importance ?2017/F**

“The methods or procedures section is really the heart of the research proposal. The activities should be described with as much detail as possible, and the continuity between them should be apparent” (Wiersma, 1995, p. 409).

The Method section is very important because it tells your Research Committee how you plan to tackle your research problem. It will provide your work plan and describe the activities necessary for the completion of your project

- ✓ The guiding principle for writing the Method section is that it should contain sufficient information for the reader to determine whether methodology is sound
- ✓ Furthermore,since there are no well-established and widely accepted canons in qualitative analysis,your method section needs to be more elaborate than what is required for traditional quantitative research
- ✓ More importantly,the data collection process in qualitative research has a far greater impact on the results as compared to quantitative research.

**1.5 Statement of problem : 2015/F**

A problem statement is a short description of the issues that need to be addressed by a problem solving team and should be presented to them (or created by them) before they try to solve a problem. On the other hand, a statement of the problem is a claim of one or two sentences in length that outlines the problem addressed by a study. The statement of the problem should briefly address the question: What is the problem that the research will address? In research, stating the problem may take only a few sentences or it may take hundreds of words. A detailed definition may result in a better understanding of the problem. There are three criteria of a good problem and problem statement.

- i) The problem should be concerned with a relation between two or more variables. However there are exceptions to this rule particularly in descriptive and quantitative studies.
- ii) It should be stated clearly and unambiguously in either an objective or a question form.
- iii) The problem should be amenable to empirical review and testing. The common experience in research teaches us that we can state the problem either in question or declarative form. For clarity, a detailed statement of the problem is preferred.

**1.6 What are the purposes of research report? Describe the characteristics of a good research report. 2015/S**

The characteristics are:

**1. Simplicity:**

The language shall be as simple as possible so that a report is easily understandable. Jargons and technical words should be avoided. Even in a technical report there shall be restricted use of technical terms if it has to be presented to laymen.

**2. Clarity:**

The language shall be lucid and straight, clearly expressing what is intended to be expressed. For that the report has to be written in correct form and following correct steps.

**3. Brevity:**

A report shall not be unnecessarily long so that the patience of the reader is not lost and there is no confusion of ideas. But, at the same time, a report must be complete. A report is not an essay.

**4. Positivity:**

As far as possible positive statements should be made instead of negative ones. For example, it is better to say what should be done and not what should not be done.

**5. Punctuation:**

Punctuation have to be carefully and correctly used otherwise the meaning of sentences may be misunderstood or misrepresented.

**6. Approach:**

There are two types of approaches: (a) Personal—When a report is written based on personal inquiry or observations, the approach shall be personal and the sentences shall be in the first person and in direct speech, (b) Impersonal—When a report is prepared as a source of information and when it is merely factual (e.g. a report on a meeting), the approach shall be impersonal and the sentences shall be in the third person and in indirect speech.

### **7. Readability:**

The keynote of a report is readability. The style of presentation and the diction (use of words) shall be such that the readers find it attractive and he is compelled to read the report from the beginning to the end.' Then only a report serves its purpose. A report on the same subject matter can be written differently for different classes of readers.

### **8. Accuracy:**

A report shall be accurate when facts are stated in it. It shall not be biased with personal feelings of the writer.

### **9. Logical Sequence:**

The points in a report shall be arranged with a logical sequence, step by step and not in a haphazard manner. A planning is necessary before a report is prepared.

### **10. Proper Form:**

A report must be in the proper form. Sometimes there are statutory forms to follow.

### **11. Presentation:**

A report needs an attractive presentation. It depends on the quality of typing or printing as well as quality of paper used. Big companies make very attractive and colorful Annual Reports.

## **The purposes of research report**

- To present the research activities that have been conducted.
- To explain the research result and findings that related to management questions.
- To present the analysis on the findings and conclusion of the study.
- To suggest the recommendations and policies necessary for solving the management questions.

## **1.7 Importance of research proposal:**

- Helps examine what the researcher intends to do.
- Research proposal can serve as a document of contract for the project.
- Research proposals can be effective starting places to discuss projects with your professors, too.
- The research proposal is able to give an overview of the research project so that other people understand the scope of the research, the significance of the research, as well as your proposed methodology and chosen research method.

## **1.8 Literature Review in depth :2017/S**

Connected to the background and significance of your study is a section of your proposal devoted to a more deliberate review and synthesis of prior studies related to the research problem under investigation. The purpose here is to place your project within the larger whole of what is currently being explored, while demonstrating to your readers that your work is original and innovative. Think about what questions other researchers have asked, what methods they have used, and what is your understanding of their findings and, where stated, their recommendations. Do not be afraid to challenge the conclusions of prior research. Estimate what you believe is missing and state how previous research has failed to adequately examine the issue that your study addresses.

Since a literature review is information dense, it is crucial that this section is intelligently structured to enable a reader to grasp the key arguments underpinning your study in relation to that of other researchers. A good strategy is to break the literature into "conceptual categories" [themes] rather than systematically describing groups of materials one at a time. Note that conceptual categories generally reveal themselves after you have read most of the applicable literature on your topic so adding new categories is an on-going process of discovery as you read more studies. How do you know you've covered the key conceptual categories underlying the research literature? Generally, you can have confidence that all of the significant conceptual categories have been identified if you start to see repetition in the conclusions or recommendations that are being made.

**To help frame your proposal's literature review, here are the "five C's" of writing a literature review:**

**Cite**, so as to keep the primary focus on the literature relevant to your research problem.

**Compare** the various arguments, theories, methodologies and findings expressed in the literature: what do the authors agree on? Who applies similar approaches to analyzing the research problem?

**Contrast** the various arguments, themes, methodologies, approaches, and controversies expressed in the literature: what are the major areas of disagreement, controversy or debate?

**Critique** the literature: Which arguments are more persuasive and why? Which approaches, findings, methodologies seem most reliable, valid or appropriate and why? Pay attention to the verbs you use to describe what an author says/does [e.g asserts, demonstrates, argues etc.]

**Connect** the literature to your own area of research and investigation: how does your own work draw upon, depart from, synthesize, or add a new perspective to what has been said in the literature?

### **1.9 Research Rationale :2014/S**

A **rationale** is a kind of sub-proposal within a proposal: it offers the reasons for proceeding to address a particular problem with a particular solution. A rationale for research is a set of reasons offered by a researcher for conducting more research into a particular subject - either library research, descriptive research, or experimental research.

Somewhere in the introduction you need to inform the reader of the rationale of your research. This is a brief explanation of why your research topic is worthy of study and may make a significant contribution to the body of already existing research.

It is important for you to be able to explain the importance of the research you are conducting by providing valid arguments.

#### **Roles for the Rationale:**

The rationale plays a role at two stages of your project:

a) when you first submit your research proposal to your advisors for their advice and approval.

(b) when you write your final version of the thesis or dissertation so readers will understand the contribution to knowledge or the contribution to practice that your work represents.

## **1.Ethnological/Ethnology :2017/S**

**Ethnography** is the systematic study of people and cultures. It is designed to explore cultural phenomena where the researcher observes society from the point of view of the subject of the study. An ethnography is a means to represent graphically and in writing the culture of a group. The word can thus be said to have a double meaning, which partly depends on whether it is used as a count noun or uncountable. The resulting field study or a case report reflects the knowledge and the system of meanings in the lives of a cultural group.

Ethnography, as the presentation of empirical data on human societies and cultures, was pioneered in the biological, social and cultural branches of anthropology, but it has also become popular in the social sciences in general—sociology, communication studies, history—wherever people study ethnic groups, formations, compositions, resettlements, social welfare characteristics, materiality, spirituality and a people's ethnogenesis. The typical ethnography is a holistic study and so includes a brief history, and an analysis of the terrain, the climate, and the habitat. In all cases, it should be reflexive, make a substantial contribution toward the understanding of the social life of humans, have an aesthetic impact on the reader and express a credible reality. An ethnography records all observed behavior and describes all symbol-meaning relations, using concepts that avoid causal explanations.

### **Advantages of ethnography:**

One of the main advantages associated with ethnographic research is that ethnography can help identify and analyse unexpected issues. When conducting other types of studies, which are not based on in-situ observation or interaction, it can very easily miss unexpected issues. This can happen either because questions are not asked, or respondents neglect to mention something. An ethnographic researcher's in-situ presence helps mitigate this risk because the issues will (hopefully) become directly apparent to the researcher.

Ethnography's other main benefit is generally considered to be its ability to deliver a detailed and faithful representation of users' behaviours and attitudes. Because of its subjective nature, an ethnographic study (with a skilled researcher) can be very useful in uncovering and analysing relevant user attitudes and emotions.

### **Disadvantages of ethnography:**

One of the main criticisms levelled at ethnographic studies is the amount of time they take to conduct. As discussed above, ethnographic studies do not always require a long period of time, but this consideration is nonetheless valid. Because of its richer output, an ethnographic study will tend to take longer to generate and analyse its data than many other methods.

During previous ethnographic studies, we have found that it is possible that subjects may not act naturally during a short study. Longer studies normally counter-act this because the subjects grow to trust the researcher and/or get tired of any pretence.

The qualitative research methodology known as 'Ethnography' is built upon the social science specialism known as 'Anthropology'.

Ethnography is a description and interpretation of a cultural or social group or system, and the ethnographic researcher examines the group's:

-behaviour

- customs

-way of life

The researcher also studies the:

- meanings of behaviour

-meanings of language

-interactions of the culture-sharing group

## **2.Why might a proposal be rejected?Give atleast 7 reasons.2017/S**

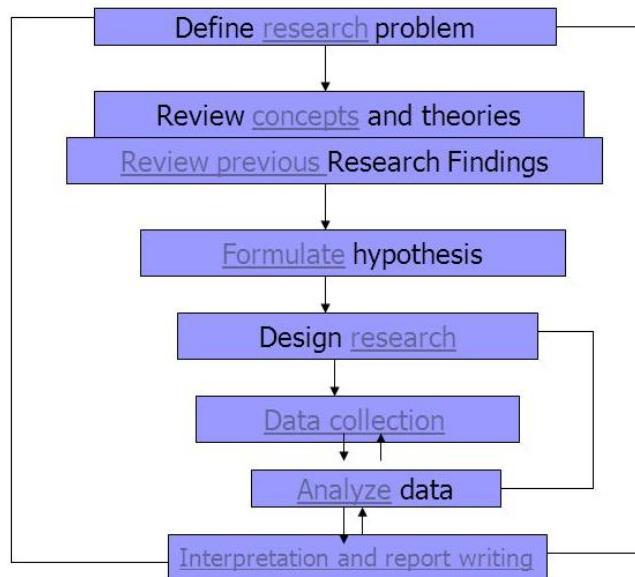
=The most common reasons for proposal rejection boil down to a surprisingly small set of simple and familiar failures:

- **Deadline for submission was not met.**
- **Proposal topic was not appropriate to the funding agency to which it was submitted.**
- **Guidelines for proposal content,format and/or length were not followed exactly.**
- The proposed question,design and method were completely traditional, with nothing that could strike a reviewer as unusual,intriguing or clever.
- The proposal was not absolutely clear in describing one or more elements of the study.
- The proposal was not absolutely complete in describing one or more elements of the study.
- The authors review of the literature indicated they did not know the territory.
- The proposed study appeared to be beyond the capacity of the authors in terms of training,experience and available resources.
- The proposed method of study was unsuited to the purpose of the research.
- The budget was unrealistic in terms of estimated requirements for equipment, supplies, and personnel.
- The cost of the proposed project appeared to be greater than any possible benefit to be derived from its completion.
- The authors took highly partisan positions on issues, and thus became vulnerable to the prejudices of the reviewers.
- The quality of writing was poor (e.g. sweeping and grandiose claims,

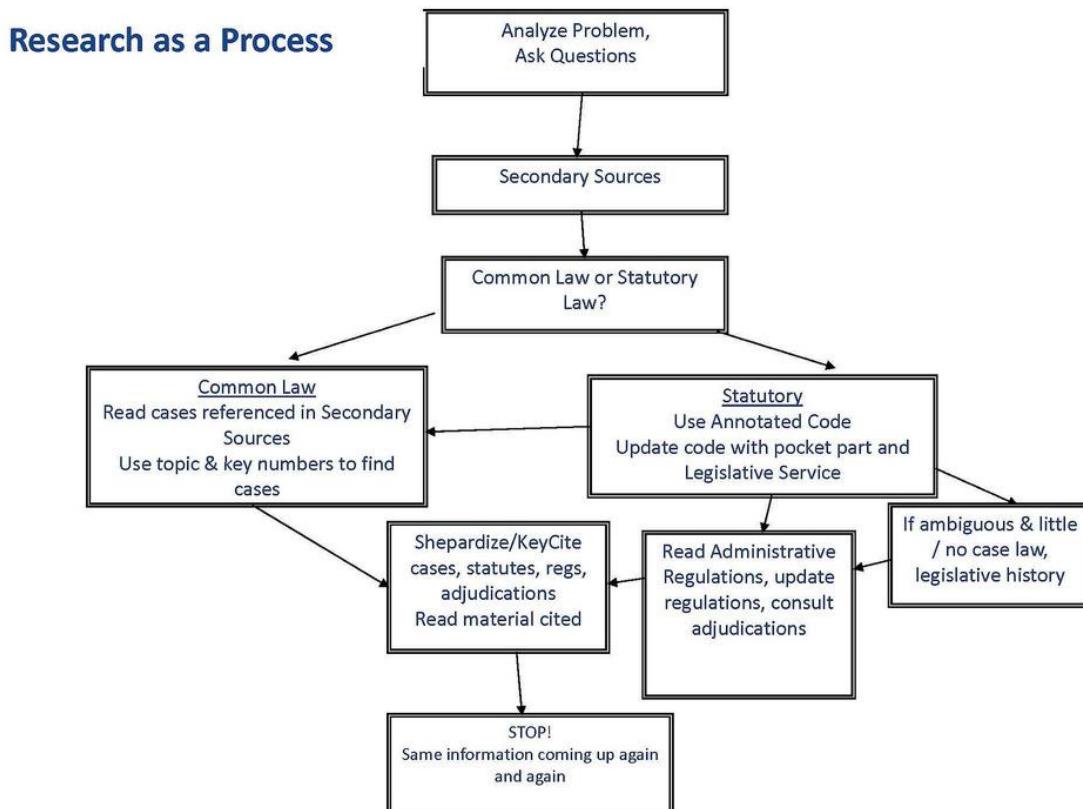
## **3.Illustrate research process in flowchart.2017/S**

=

# Research Process Flow Chart



OR,



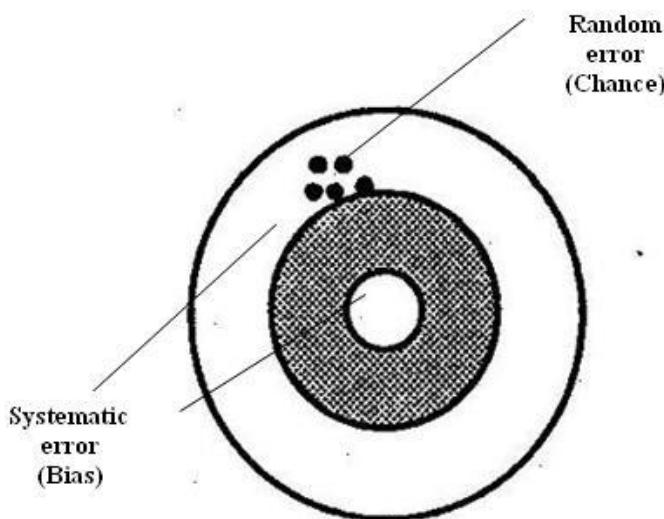
OR,



**4.A systematic bias results from errors in the sampling procedures.What do you mean by such a systematic bias?Describe the important cause responsible for such a bias.2017/S**

=In statistics,**sampling error** is incurred when the statistical characteristics of a population are estimated from a subset, or sample, of that population. Since the sample does not include all members of the population, statistics on the sample, such as means and quartiles, generally differ from the characteristics of the entire population, which are known as parameters. For example, if one measures the height of a thousand individuals from a country of one million, the average height of the thousand is typically not the same as the average height of all one million people in the country. Since sampling is typically done to determine the characteristics of a whole population, the difference between the sample and population values is considered a sampling error. Exact measurement of sampling error is generally not feasible since the true population values are unknown; however, sampling error can often be estimated by probabilistic modeling of the sample.

Sampling bias is a possible source of sampling errors, wherein the sample is chosen in a way that makes some individuals less likely to be included in the sample than others. It leads to sampling errors which either have a prevalence to be positive or negative. Such errors can be considered to be systematic errors.



**5.Discuss about inferential,experimental and simulation approaches in research.2017/S**

=

**Inferential approach**

- The purpose of this approach is to form a database from which to infer characteristics or relationships of population.
- e.g. survey report of a sample of population its characteristics is studied, and it is determined that the entire population has the same characteristics

**Experimental approach**

- This approach has much greater controller over the research environment and in this case some variables are manipulated to observe their effect on the results
- e.g. companies using different methods to enhance the management of the organization

**Simulation approach**

- This approach involves the construction of an artificial environment within which relevant information and data can be generated. This helps in studying the dynamic behaviour of a system under controlled conditions.

## **How to Write a Research Proposal ?**

**Paul T. P. Wong, Ph.D., C.Psych.**

**Research Director, Graduate Program in Counselling Psychology**

**Trinity Western University**

**Langley, BC, Canada**

Most students and beginning researchers do not fully understand what a research proposal means, nor do they understand its importance. To put it bluntly, one's research is only as good as one's proposal. An ill-conceived proposal dooms the project even if it somehow gets through the Thesis Supervisory Committee. A high quality proposal, on the other hand, not only promises success for the project, but also impresses your Thesis Committee about your potential as a researcher.

A research proposal is intended to convince others that you have a worthwhile research project and that you have the competence and the work-plan to complete it. Generally, a research proposal should contain all the key elements involved in the research process and include sufficient information for the readers to evaluate the proposed study. Regardless of your research area and the methodology you choose, all research proposals must address the following questions: What you plan to accomplish, why you want to do it and how you are going to do it. The proposal should have sufficient information to convince your readers that you have an important research idea, that you have a good grasp of the relevant literature and the major issues, and that your methodology is sound.

The quality of your research proposal depends not only on the quality of your proposed project, but also on the quality of your proposal writing. A good research project may run the risk of rejection simply because the proposal is poorly written. Therefore, it pays if your writing is coherent, clear and compelling. This paper focuses on proposal writing rather than on the development of research ideas.

### **Title:**

It should be concise and descriptive. For example, the phrase, "An investigation of . . ." could be omitted. Often titles are stated in terms of a functional relationship, because such titles clearly indicate the independent and dependent variables. However, if possible, think of an informative but catchy title.

### **Abstract:**

It is a brief summary of approximately 300 words. It should include the research question, the rationale for the study, the hypothesis (if any), the method and the main findings. Descriptions of the method may include the design, procedures, the sample and any instruments that will be used.

### **Introduction:**

The main purpose of the introduction is to provide the necessary background or context for your research problem. How to frame the research problem is perhaps the biggest problem in proposal writing.

If the research problem is framed in the context of a general, rambling literature review, then the research question may appear trivial and uninteresting. However, if the same question is placed in the context of a very focused and current research area, its significance will become evident.

Unfortunately, there are no hard and fast rules on how to frame your research question just as there is no prescription on how to write an interesting and informative opening paragraph. A lot depends on your creativity, your ability to think clearly and the depth of your understanding of problem areas.

However, try to place your research question in the context of either a current "hot" area, or an older area that remains viable. Secondly, you need to provide a brief but appropriate historical backdrop. Thirdly, provide the contemporary context in which your proposed research question occupies the central stage. Finally, identify "key players" and refer to the most relevant and representative publications. In short, try to paint your research question in broad brushes and at the same time bring out its significance.

The introduction typically begins with a general statement of the problem area, with a focus on a specific research problem, to be followed by the rational or justification for the proposed study. The introduction generally covers the following elements:

1. State the research problem, which is often referred to as the purpose of the study.
2. Provide the context and set the stage for your research question in such a way as to show its necessity and importance.
3. Present the rationale of your proposed study and clearly indicate why it is worth doing.
4. Briefly describe the major issues and sub-problems to be addressed by your research.
5. Identify the key independent and dependent variables of your experiment. Alternatively, specify the phenomenon you want to study.
6. State your hypothesis or theory, if any. For exploratory or phenomenological research, you may not have any hypotheses. (Please do not confuse the hypothesis with the statistical null hypothesis.)
7. Set the delimitation or boundaries of your proposed research in order to provide a clear focus.
8. Provide definitions of key concepts. (This is optional.)

### Literature Review:

Sometimes the literature review is incorporated into the introduction section. However, most professors prefer a separate section, which allows a more thorough review of the literature. The literature review serves several important functions:

1. Ensures that you are not "reinventing the wheel".
2. Gives credits to those who have laid the groundwork for your research.
3. Demonstrates your knowledge of the research problem.
4. Demonstrates your understanding of the theoretical and research issues related to your research question.

5. Shows your ability to critically evaluate relevant literature information.
6. Indicates your ability to integrate and synthesize the existing literature.
7. Provides new theoretical insights or develops a new model as the conceptual framework for your research.
8. Convinces your reader that your proposed research will make a significant and substantial contribution to the literature (i.e. resolving an important theoretical issue or filling a major gap in the literature).

Most students' literature reviews suffer from the following problems:

- Lacking organization and structure
- Lacking focus, unity and coherence
- Being repetitive and verbose
- Failing to cite influential papers
- Failing to keep up with recent developments
- Failing to critically evaluate cited papers
- Citing irrelevant or trivial references
- Depending too much on secondary sources

Your scholarship and research competence will be questioned if any of the above applies to your proposal. There are different ways to organize your literature review. Make use of subheadings to bring order and coherence to your review. For example, having established the importance of your research area and its current state of development, you may devote several subsections on related issues as: theoretical models, measuring instruments, cross-cultural and gender differences, etc.

### **Methods:**

The Method section is very important because it tells your Research Committee how you plan to tackle your research problem. It will provide your work plan and describe the activities necessary for the completion of your project. The guiding principle for writing the Method section is that it should contain sufficient information for the reader to determine whether methodology is sound. Some even argue that a good proposal should contain sufficient details for another qualified researcher to implement the study.

You need to demonstrate your knowledge of alternative methods and make the case that your approach is the most appropriate and most valid way to address your research question.

Please note that your research question may be best answered by qualitative research. However, since most mainstream psychologists are still biased against qualitative research, especially the phenomenological variety, you may need to justify your qualitative method.

Furthermore, since there are no well-established and widely accepted canons in qualitative analysis, your method section needs to be more elaborate than what is required for traditional quantitative research. More importantly, the data collection process in qualitative research has a far greater impact on the results as compared to quantitative research. That is another reason for greater care in describing how you

will collect and analyze your data.(How to write the Method section for qualitative research is a topic for another paper.)

For quantitative studies, the method section typically consists of the following sections:

1. Design -Is it a questionnaire study or a laboratory experiment? What kind of design do you choose?
2. Subjects or participants -Who will take part in your study ?What kind of sampling procedure do you use?
3. Instruments -What kind of measuring instruments or questionnaires do you use? Why do you choose them? Are they valid and reliable?
4. Procedure -How do you plan to carry out your study?What activities are involved?How long does it take?

### **Results:**

Obviously you do not have results at the proposal stage.However,you need to have some idea about what kind of data you will be collecting, and what statistical procedures will be used in order to answer your research question or test your hypothesis.

### **Discussion:**

It is important to convince your reader of the potential impact of your proposed research. You need to communicate a sense of enthusiasm and confidence without exaggerating the merits of your proposal. That is why you also need to mention the limitations and weaknesses of the proposed research, which may be justified by time and financial constraints as well as by the early developmental stage of your research area.

### **Common Mistakes in Proposal Writing:**

1. Failure to provide the proper context to frame the research question.
2. Failure to delimit the boundary conditions for your research.
3. Failure to cite landmark studies.
4. Failure to accurately present the theoretical and empirical contributions by other researchers.
5. Failure to stay focused on the research question.
6. Failure to develop a coherent and persuasive argument for the proposed research.
7. Too much detail on minor issues, but not enough detail on major issues.
8. Too much rambling -- going "all over the map" without a clear sense of direction. (The best proposals move forward with ease and grace like a seamless river.)
9. Too many citation lapses and incorrect references.
10. Too long or too short.