

MMC302: COMMUNICATION RESEARCH METHODS

UNIT 1: RESEARCH METHODS IN SOCIAL SCIENCES

UNIT STRUCTURE

- 1.1 Meaning of Research
 - 1.1.1 Definition of Research
 - 1.1.2 Characteristics of Research
- 1.2 Elements of research
- 1.3 Types of Research Design
- 1.4 Communication Research

OBJECTIVES

- To understand the basic meanings of research
- To learn the important concepts of research
- To understand the meaning of communication research
- To develop research orientation and scientific methodology

1.1 MEANING OF RESEARCH

Research is central to communication and media studies. In simple terms research is asking questions and finding the answers. But, research goes much further to systematically explore any phenomena assisted by well defined questions, to produce newer information while refining the older information. The researcher, by applying his or her critical analytical skills can further process the newer information and transform it to knowledge. Talking about knowledge, one needs to introspect on the existing body of knowledge all of which may not withstand scientific scrutiny. We have knowledge system which are forced upon us by the authorities, religious dogmas, traditional beliefs, and elders. Research's ultimate purpose is to replace the unscientific knowledge with rational and scientific knowledge.

Why media and communication scholars in particular need to engage in research? Today the world is tagged as information society enhanced by communication technologies and

proliferation of mass media. The number and types of mass media have multiplied over the years leading to changes in audience compositions and preferences too. The national and world politics too have been undergoing change with greater than ever before interdependency and interconnectivity. It is in this context, there is increasing need for information and knowledge which is credible and trustworthy.

1.1.2 DEFINITION OF RESEARCH

The term research has been defined by various scholars in different terminologies giving the essential character of the activity that is scientific investigation.

Burns (1994) defines research as ‘systematic investigation to find answers to a problem’. According to Kerlinger (1986), ‘scientific research is a systematic, controlled empirical and critical investigation of propositions about the presumed relationships about various phenomena.’ Bulmer (1977) stated that ‘sociological research is primarily committed to establishing systematic, reliable and valid knowledge about the social world.’ In summary research is therefore, systematic exploration of any phenomena.

Earlier in 1950s the Advanced Learner’s Dictionary of Current English (1952), gave the meaning of research as ‘a careful investigation or inquiry specially through search new facts in any branch of knowledge.’”

All of these definitions stress on the key terms such as: systematic, scientific, empirical, and critical investigation. C.R. Kothari (1990) quoted Clifford Woody who gave a summary of the entire process of research comprising defining and redefining problems, formulating hypothesis or suggested solutions; collecting, organizing, and evaluating data, making deductions and reaching conclusions; and at last carefully testing the conclusions to determine whether they fit the formulated hypothesis.

1.1.3 CHARACTERISTICS OF RESEARCH

The scientific character of any endeavour can be understood by the presence of the following aspects.

Systematic: the scientific methods follow a procedure that is well defined and capable of being repeated for further verification and testing. The different steps that are taken cannot be done haphazardly, but must follow a logical sequence.

Rational: rational is opposite to emotion, that is proven by logical reasons in both discovering a phenomena and explaining its nature. Generally two modes of reasoning is followed in research: inductive and deductive. Inductive reasoning follows by observing particular phenomena and proceeds to generalized conclusions, while deductive reasoning follows observing general premise which are true for particulars.

Self-correcting: Scientific inquiry which turns back on itself over and over to match the observed phenomena with general explanations.

Controlled: One of important purposes of research is find the cause and effect relationships. It is relatively easy to find what causes what in science in the laboratories, but finding causations of human behaviour is not that easy. In social life a multitude of factors affect an outcome. However, it is crucial to identify the primary causes of behaviour we want to change. In India the use of communication and media was considered a boon to bring in social change and development therefore it was essential to establish the linkages between the two by isolating other factors. However, unlike laboratory, it is impossible to isolate multitude of factors that affect a particular factors, therefore the choice is to quantify different factors and their impact.

Valid and verifiable: The idea is that the finding of a research is correct and if retested by others would yield similar results under similar conditions.

Critical: The procedures adopted and the process followed must be free from bias and should be able to withstand critical scrutiny. Conclusions should not be made quickly and easily without putting the variables into rigorous procedures.

Empirical: This means the evidence collected to explain a phenomena should be based on observable facts that must be intelligible to our senses in the real life experiences and should not be speculative.

Objective: It means things as it is rather than as you see it. Research must try to look at evidences and experiences not from one's own point of view but from the point of the phenomenon itself. In daily life, we spend lot of time evaluating others people's findings and experiences to see the weaknesses and strengths, the same yardstick should be applied to look at our findings and conclusions.

1.2 ELEMENTS OF RESEARCH

Hypothesis: It is a generalization presented in tentative and conjectural terms. It is an assertion about preexisting conditions that are subject to verification and proof. It is also simply put as a declarative statement. Conjectural statement predicting specified type of relationship between two or more classes of communication behaviour, under explicitly defined conditions.

Variable: Any class of communication behaviours that can take on different values. Variable is a measurable phenomenon or event that can be measured or manipulated. Logical groupings of attributes.

Intervening variables : They refer to abstract processes that are not directly observable but that link the independent and dependent variables. e.g. In language learning and teaching, they are usually inside the subjects' heads, including various language learning processes which the researcher cannot observe.

Extraneous variables are those factors in the research environment which may have an effect on the dependent variable(s).

Attribute: Characteristics or qualities that describe an object. e.g. if sex is a variable, male and female are attributes.

Independent variable: A variable that is presumed to cause or determine a dependent variable.

Dependent variable: A variable that is assumed to depend on or is caused by another variable.

Induction: Logical model in which general principles are developed from specific observations.

Deduction: Logical model in which specific expectations of hypotheses are developed on the basis of general principles.

Research question: an interrogative statement that asks what kind of relationship or whether a specified relationship exists between two or more communication variables.

Data: It is collection of information either in quantitative or qualitative forms that help us to explain or make conclusions about any phenomenon.

1.3 TYPES OF RESEARCH DESIGN

Research design is the plan of how to go about carrying out different stages of research. It is like having the blueprint of the house before commencement of construction of a house. The research design puts in all the details and decisions about what, when, where, and how means of an inquiry. In other words it answers questions related to; What is the study about, why the study is being made, what type of data is required, where can the required data found, what periods of time the study include, what will be the sample design, what techniques of data collection used, how will you analyse the data, and in what style the report be prepared. Therefore research design is essential before plunging into any inquiry. It is a comprehensive data collection plan whose purpose is to answer research questions and test hypothesis. We may define “Research Design as the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure”.

Research design in communication and media research broadly is based on approaches available and different methods, tools and techniques appropriate to the subject matter. We shall look at some of the approaches and methods followed in social science researches, which are also appropriate to communication field.

- **Applied Research**

Applied research, also called Action research are undertaken to address some immediate concerns or to provide logistic support to societal endeavours. Most of media and communications research are related to applied research. Some of the common researches such as readership surveys, communication campaigns, evaluation studies, ex-post-facto studies, policy research, and market research are applied research.

- **Fundamental Research**

Fundamental research is also called Pure research are those researches that are interested in expanding the understanding and knowledge of any phenomenon.

Unlike applied research the immediate reason for undertaking a research is not to provide any solution to some problems, although in the long run, their findings help shape the framework for further researches including applied research. The end product of pure research consists of theories and explanations of concepts, practices, systems, process, and so on. The communication models like Newcomb's Gate keeping model or theories like Spiral of Silence or Dependency theories are outcome of primarily of fundamental research.

- Quantitative Research

Quantitative research in simple terms attempts to measure different aspects of human behaviour including those related to communication and media by assigning numerical values. In our day-to-day life we see lots of numerical descriptions to understand and interpret human society, for example the population figures, family income, age, physical features like height and weight, sex ratio, percentage of people using particular media and many more. Thus quantitative understanding is unavoidable in any scientific explanations of things and people, however, the qualitative approach differs not by avoiding numerical values but by differing in emphasis on quantification.

Quantitative research is crucial also to test hypotheses, find correlations, and critical differences and classifications.

- Qualitative Research

Qualitative research may on the one hand stand opposite to quantitative methods, on the other hand, both methods complement each other in eliciting better understanding of any phenomena. The primary difference, therefore is the philosophy of treating human beings, not merely as figures and facts but as human agents capable of independently thinking and acting. The emphasis of qualitative methods therefore is on meanings of signs and symbols used in social interactions in specific socio-political cultural and historical contexts.

- Exploratory research

As the term exploratory implies, this type of researches are to unearth unknown phenomena and not-thought-about relationships between different variables. Communication between animals, plants, inanimate objects and others are still being explored. The research design therefore, would contain lot of flexibility but at the same time leave enough footprints for future analysis and repeatability of procedures.

- Explanatory research

The primary purpose of explanatory research is to explain how certain responses occur in given conditions. This method can be also called as Analytical research. They also try to discover cause and effect relationship between number of explained socio-cultural practices. This approach begins with simple description of any phenomenon and from there it proceeds to find connections between one variable or other. The development communication scholars like Daniel Lerner and Everett Rogers tried to explain the causes for backwardness of some societies and tried to introduce those variables that would act as catalyse of change and modernisation.

- Experimental research

Experimental research may sound like scientific testing and laboratory experiments, however, many of human behaviours too can be studies applying similar techniques. The experimental research design works by dividing two groups; one as controlled group and the other as experimental group. The experimental group is exposed to variables which needs to be tested while the controlled group is kept away from the specified variables and at the end the effects are observed to see whether there is any significant difference between two groups. Many studies on children are conducted using experimental method, including the effect of viewing violent television shows and many such issues.

The above mentioned types of research designs are by no means an exhaustive list. They are broadly the methods and approaches adopted so as to create the suitable research

design following the basic principles of methods and approaches that suit the research questions and objectives of respective inquiries.

1.4 COMMUNICATION RESEARCH

The meaning of ‘communication’ is complex and varies from context to context. Any attempt to understand a phenomena, in our case the phenomena of communication must begin with defining what it is. In simple terms, communication is the act of imparting information. This act of imparting may be voluntary or involuntary, conscious or unconscious process.

The earliest models of communication emphasized the technological part of human communication, for example, the telegraph. Telegraph functions by using signals, codes, transmitters, messages, wires, and also two people as sender and receiver. A person (sender) presses Morse button (transmitter), to send a signal (a medium) along a wire (channel) to another person (receiver), the Morse codes are set of symbols to refer to agreed upon meanings.

There are many variations to this model which have changed over time. More elements like channel noise, feedback and so others were added to the models. A researcher who wants to study communication may take up any aspect of the process.

The media is an intermediary that enables communication across time and space. The medium is used even during communication between two people like telephone, letter, email, and text message. However, we think of mass media as those technologies which provide a link between many people like radio, television, newspapers, films and the internet. These media operate as institutions with well organizational structures. Research can be undertaken to study the contents, media institutions, the individuals who are part of it, or the audience who consume the media content.

The academic institutions which study the process of communication and media are called communication studies, media studies and so on. Communication is a diverse discipline. Though old as a traditional studies, but young as a science, the discipline of communication can be organized on sociological, psychological, anthropological, literature, linguistic and cultural studies grounds. It begins with smallest sociological unit interpersonal communication and moving to the larger settings of organizational

communication through journalism and mass communication and intercultural communication (Anderson 1987).

Communication can also be organized by the elements in the process of communication. They are content, medium, and settings of presentation, outcomes, and the process itself. Researchers can examine the content, its nature, or modes of production, or some may emphasize on the cultural, economic, or sociological institutions of the modes of production. Some others may be interested in the communicants, the speakers, audience, listeners, actors, and their intentions, motives, purposes and levels of satisfaction. We can also focus on the effect of the communication process on individuals or groups, the audience, the economic or political systems, and societies (Anderson 1987). In taking up inquiry on any of these aspects one may apply different approaches and methods available in social sciences as we mentioned earlier like sociology, psychology, linguistics, and others.

SAMPLE QUESTIONS

- Define research and explain how research has contributed to newer understandings
- What is research? Give various definitions given over the period of time.
- Distinguish scientific knowledge from other knowledge sources and give the characteristics of research based knowledge.
- Describe different types and research and how can they be used in media and communication studies?
- Mention what is communication research? State the its importance in today's world.

SUGGESTED READINGS

- Kothari, C.R (1990) *Research Methodology: Methods and Techniques*, Second edition, New Delhi: Wishwa Prakashan.
- Anderson, A. James (1987) *Communication Research: Issues and Methods*, New Delhi: McGraw-Hill Book Company.

UNIT 2 RESEARCH PROCESS

UNIT STRUCTURE

- 2.1. Learning goals
- 2.2. Introduction
- 2.3 Formulation of research problem
- 2.4 Writing a Research Proposal
- 2.5 Hypothesis formulation
- 2.6 Tools for Data Collection
- 2.7 Let us sum up
- 2.8 Probable questions
- 2.9 Further Readings

2.1 LEARNING GOALS

At the end of this unit you should be able to:

- Understand what is research process
- Know how to formulate a research problem
- Know what is hypothesis and how to formulate it
- Understand how tools for data collection

2.2 INTRODUCTION

We shall discuss about research process in this unit. Let us recall what you already have learnt about research in your earlier units. Research is the systematic process of collecting and analyzing information to increase our understanding of a problem or a phenomenon. It is a process of investigation and examination of a subject from different perspective. It is a search for knowledge.

Besides, research could also be understood as an attempt to create new knowledge in a creative way so as to generate new concepts, methodologies and understandings of an issue or a phenomenon. One could analyze research work which has already been

conducted earlier or even further a particular work with newer insights to the extent that it leads to new and creative outcome. The main purpose of research is to describe, predict and determine the causes and explain about a particular phenomenon. You should know the purpose of research and why it is necessary to conduct research.

CHECK YOUR PROGRESS- A

- 1) What is the importance of research?

2.3 FORMULATION OF RESEARCH PROBLEM

In this section we shall learn what a research problem is. These are questions which indicate gaps or some curiosity which exist in our understanding of external environment. Research questions point either to a phenomenon, observed events that are puzzling in terms of the way how we look at certain issues or take positions that are challenged by certain presumptions. In fact this is of utmost importance and we need to learn how to formulate a research problem and the factors that should be taken into consideration in research.

We should keep in our mind that identification of a research problem is the first step in scientific inquiry and research as we have understood is a systematic investigation of any phenomenon.

Research problem helps the researcher in understanding an issue which could be researched upon. The problem defines the goal of the researcher in clear terms. We should know that without a problem, research cannot proceed because we will not know what has to be researched upon. In social sciences, many researchers face this problem, i.e., the problem of not being able to identify a problem.

Now let us understand how researchers come up with the idea of a research problem?

- Our day to day experience of life in our social setting gives us new insights on what could be researched upon
- Our engagement with the society helps us to generate ideas based on the things which are happening around us
- Another source for research ideas is the existing body of knowledge in a particular field
- Researchers could get ideas by thinking of ways to extend or refine research which has earlier been conducted
- Some researchers also might think of conducting a research which has not been explored much or not explored at all.

What is the most important phase of a research? Selection of a suitable research problem is one of the most difficult phases of any research. This is difficult because finalizing a research problem itself is very problematic at times. One might take a long time in making his or her choice on a particular research problem. Selecting a suitable research problem is very important because feasibility of the research area has to be taken into consideration. Therefore, one should not make quick decision rather sufficient time has to be given while selecting a research problem. One should think of doing a research in an area which interests him/her. Every problem, which comes to his or her mind, may not be a suitable research problem. We can say that in a way the identification of a research problem should be considered a discovery in itself.

Now let us understand the criteria of a research problem. The following are some of the questions that should be borne in our mind before selecting a research problem.

- Is the topic important enough to be researched?
- Is there any novelty in the research?
- Is the topic interesting to be researched upon?
- Would I get sufficient literature on the topic?
- Is there any practical application of my research?
- Is the topic feasible enough?

- Will I be able to complete the research work in the stipulated time frame?

Once we have identified the research problem we now need to formulate and state the problem in precise terms. This is important because it will give us a sense of direction as we proceed in our investigation.

CHECK YOUR PROGRESS- B

- 2) What is a research problem?

2.4 WRITING A RESEARCH PROPOSAL

In this section we shall learn how to write a research proposal. Before conducting any research activity a research proposal has to be prepared indicating the details of the research. This needs to be approved by the supervisor. The procedures of research proposal are well defined by the field of study, so a guideline for research proposals has to be written in a systematic manner.

Let us learn the basic and the most important features in a research proposal.

- Research proposals contain extensive literature reviews
- Must offer convincing support of need for the research study being proposed.
- There has to be a rationale for the proposed research
- Could have a theoretical framework
- Limitations and Constraints of the problem being studied
- Proposal must describe a detailed methodology for conducting the research, a methodology consistent with requirements of the professional or academic field.

We shall learn more about writing a research proposal as we proceed.

The purpose of the proposal is to help you to focus and define your research plans. These plans are not binding, in that they may well change substantially as you progress in the research.

The research proposal is expected to:

- Show that you are working on something worthwhile
- Establish link with other research work
- Link your research with theories relating to the topic
- Establish methodological approach
- Show that you have thought about the ethical issues

Now let us understand the structure of a proposal. The following outline covers the primary components of a research proposal.

1. Statement of research problem: Indicate what you intend to study. You should also mention the rationale of your study and scope of the study which you have undertaken. Limitations and constraints of the research should be indicated in this section
2. Review of Literature: In this section you should extensively review the existing body of knowledge pertaining to your research problem
3. Theoretical framework: Theoretical framework will make your research very substantial. You should try to link up your research problem to certain theories
4. Objectives and Methodology: You need to specify the objectives of your research. This will give a sense of direction to your research. You should think of the feasibility of your topic

Research method: The researcher has to specify the research method that would be adopted for conducting the research. For example it could be a survey method or a case study method. Research methods would vary from topic to topic

Sample size: The sample size has to indicate. For example the sample size of your research is 400 respondents. This again would depend on the kind of research problem you have considered for your research.

Sampling technique: There are different types of sampling technique such as random sampling technique, quota sampling technique etc. You shall be learning about sampling technique in other units of this course. Sampling technique will enable you to select the respondents in a systematic manner.

Data collection: Data primarily is of two types viz, primary data and secondary data. For instance for collecting primary data you can conduct interviews or use questionnaires to collect data. Similarly you can collect secondary data from books, journals, reports, articles etc.

Data analysis: You need to specify how you will analyze the data you have collected. Will the data be manually analyzed or it would be analyzed through some computer software.

Schedule of Activities: The researcher should specify how he/she would schedule for the different phases of the research. For example when and for how long would the researcher require for distributing the questionnaire to the respondents if questionnaire is being used as one of the tool for data collection.

References: Finally the researcher has to indicate the references he/she has made for writing the research proposal.

Moreover, we need to have an estimated budget that would be required for conducting the research.

CHECK YOUR PROGRESS- C

- 3) Write a research proposal to conduct a research on role of media in society

2.5 HYPOTHESIS FORMULATION

We shall discuss about hypothesis in this section. A hypothesis is a possible answer to a research question. It is a presumption on which a particular study is conducted. Hypothesis helps in formulating research problem. A valid and reasonable research can be conducted without any hypothesis. Hypothesis can be one and it can be as many as possible.

Let us now understand the importance of a hypothesis.

- Provides direction to the research
- Defines what is relevant and what is irrelevant
- Helps us understand the situations relating to the research problem
- Guide researchers in the thinking process

We should keep in our mind that without hypothesis, research would be like a random and aimless endeavour. It places clear and specific goals before us. These clear and specific goals provide the investigator with a basis for selecting samples and research procedures to meet these goals.

CHECK YOUR PROGRESS- D

- 4) What is a hypothesis?

2.6 TOOLS FOR DATA COLLECTION

We have discussed primary and secondary data in our earlier section. In this section we shall learn how we can be more systematic in data collection. Data in research parlance means the information that you will be gathering for the research. Data can be collected in a variety of ways and from a variety of sources.

The process of data collection so that we know exactly how the data that is required for the research has to be collected in a more systematic manner. Now what are data collection tools? These are instruments used to collect information required for conducting the research. The data collection tools have to be appropriately designed so that it enhances the findings of the research. Besides, this would make the research substantial.

We have learnt the characteristics of data earlier and we know what kind of information we need to look for. Therefore we have to use different tools for collecting data. As we know the nature of the information to be collected we use different tools for collecting data. It could be gathered from official sources such as government reports; through surveys or interviews, through interactions with the respondents etc.

We should keep in our mind that certain techniques are used while collecting data. This would make our research findings reliable and valid. For instance we use techniques such as simple random sampling technique, quota sampling, cluster sampling, convenience or purposive sampling etc. Details of these techniques must have been discussed in other units.

Data collection techniques allow us to systematically collect information required for the research. In the collection of data we have to be systematic. If data are collected haphazardly, it will be difficult to answer our research questions in a conclusive way.

The following are the different data collection techniques that could be used while conducting research.

- Questionnaires
- Using available information
- Telephonic interactions
- Internet
- Observations
- Interviews
- Administering questionnaires
- Focus group discussion

CHECK YOUR PROGRESS- E

5) What is primary and secondary data?

2.7 SUMMING UP

In this unit you have come to know about research process. You have also learnt about how to formulate a research problem. Further, you have also learnt about hypothesis and its importance in research. Primary and secondary data have been discussed in detail. The tools used in data collection have also been discussed. As you have come to know about them it will help you in understanding research process and how to write a research proposal. You will be able to apply these concepts while conducting research.

2.8 PROBABLE QUESTIONS

1. What is a research problem?
2. What is a primary and secondary data?
3. Discuss the different stages of a research proposal
4. What is hypothesis and what its significance in research?

2.9 SUGGESTED READING

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UNIT 3: SAMPLING DESIGN

UNIT STRUCTURE

- 3.1 The meaning of sampling
- 3. 2 Sampling Concepts
 - 3.2.1 Population
 - 3.2.2 Sampling Unit or Element
 - 3.2.3 Sampling Frame
 - 3.2.4 Sample
 - 3.2. 5 Sampling Statistics and Population Parameters
 - 3.2.6 Sampling Error
- 3.3 Probability Sampling Techniques
 - 3.3.1 Simple Random Sampling
 - 3.3.2 Systematic Sampling
 - 3.3.3 Stratified Sampling
 - 3.3.4 Multistage Cluster Sampling
- 3.4 Nonprobability Sampling Techniques
 - 3.4.1 Purposive Sampling
 - 3.4.2 Convenience Sampling
 - 3.4.3 Quota Sampling
 - 3.4.4 Snowball Sampling
- 3.5 Sample Size
- 3.6 Sampling in Quantitative method
- 3.7 Sampling in Qualitative method

OBJECTIVES

- To understand the meaning and importance of sampling in research
- To understand different sampling techniques used in social science research
- To gain ability to construct sampling frame and generate samples
- To distinguish different sampling techniques with different types of data collection

3.1 THE MEANING OF SAMPLING

This Unit discusses the meaning of sampling in research and how to apply sampling techniques for collecting data for different studies. Sample is a group selected from a larger population and it represents the population from which it came.

When the researcher wants to find the average income of an families living in a town. One has to go to every family and add up their incomes and divide by number of household to get the average income. There is another way of doing it, select few families

from different parts of the town and add them and divide that by number families selected. One still gets near to average income. The first method is extremely time consuming and not feasible for individuals, in addition the chances of committing errors are high. Therefore, it is advantages, economical, fast and more reliable to take a sample and find out any factor about the population.

Sampling, therefore, is the process of selecting a few (sample) from the bigger group (the sampling population) to become the basis for estimating or predicting a fact, situation or outcome regarding the bigger group. A sample is the subgroup of the population one is interested in (reference).

Studying a sample instead of the whole population may result in both merits and demerits. The merits are that it will save time, more economical, less human resources are needed and easy and reliable to process the data. The demerits are that one cannot find out about the characteristics related to the entire population and only will be able to approximate the facts of the characteristics.

Broadly, there are two approaches to select a sample for study: probability sampling and non-probability sampling. Probability sampling is considered scientific and valid method, where as non-probability method is considered unscientific as it do not ensure representative sample. Let us begin with looking at some of the basic concepts in sampling.

3.2 SAMPLING CONCEPTS

Any understanding of sampling must be accompanied by understanding its related concepts such as: population, sampling unit, sampling frame, sample, sampling error and statistical parameters.

3.2.1 POPULATION

Population is the total number of group about which one wants to draw conclusions. This may vary large,- all TV serial viewers' or much smaller, - 'all TV serial viewers in Tezpur'. Any population is a well defined group of elements taken up for research study. Population may be all animated programmes in Television, or all readers of a particular newspapers, or viewers of a televised programme, or collection of newspaper articles on

children, etc. A population is therefore a universal set consisting of all individual elements. A population must be distinct enough to be generalized with the findings of the sample.

3.2.2 SAMPLING UNIT OR ELEMENT

Sampling unit or element is the basic unit about which information is collected. For example, each student, of family, or media content that becomes the basis of the sample for study.

3.2.3 SAMPLING FRAME

Sampling frame is a list consisting of all sampling units, from which the sample is selected, for example a list of all voters from a constituency, or list of all residents in an area. Sampling frame is the concrete identifiable sampling units. The sampling frame should be accurate and complete. If there is any discrepancy in the sampling frame that will subsequently lead to sampling error and unreliability of the data.

3.2.4 SAMPLE

A sample is a subset of the population. Sample must be representative of the population. When the population is homogeneous the small sample would reflect the characteristics of the entire population. However, if the population is heterogeneous, the sample size needs to be bigger and also must reflect proportional heterogeneity.

3.2.5 STATISTICS AND PARAMETERS

A statistic is the numerical character of the sample, while the parameter is numerical feature of the population. For example, statistic is average income of the sample, if we measure the entire population and calculate the average income that would be the parameter. But, generally, it is not possible to study the entire population and come out with exact values of parameter. Therefore, we infer the parameters by studying the values from the sample. The accuracy of measurement depends on how much the sample drawn is truly representative.

3.2.6 SAMPLING ERROR

Sampling error is the extent to which population parameters deviate from sample statistics. In spite of attempt to carefully select a representative sample and listing out the

sampling frame, the sample values are only approximate population parameters and never accurate. That is why, the probability theory helps us to estimate, how much the sample statistics may vary from the population parameters, using confidence level and confidence interval.

Confidence level specifies how much of our statistics are reliable estimates of the population parameters, while confidence interval mentions, how far one can expect the sample statistics vary from population values.

3.3 PROBABILITY SAMPLING TECHNIQUES

Probability sampling is considered scientific since the choice of specific sampling unit is not chosen willfully by the researcher, secondly, the concept of probability implies that every sampling unit has equal amount of probability of being selected as the sample. In media and communication researches four types of sampling techniques are generally applied, they are: simple random sampling, systematic sampling, stratified sampling, and multistage cluster sampling.

Probability theory is based on random principle that assumes that each random sample from a specified parent population provides an assessment of the population parameters. Secondly, the probability theory assumes that multiple samples drawn from the parent population will yield similar statistics if from the same parent population.

3.3.1 SIMPLE RANDOM SAMPLING

Simple random sampling is one of the basic methods of drawing representative sample, provided the population is homogeneous. For example, in order to test one blood profile, requiring perhaps five milliliter of blood can be drawn from any part of the body. When the sample units are discrete, that is, when each unit is independent, simple random sampling is carried out by assigning numbers to each unit and preparing a sampling frame and followed by selecting desired sample size randomly by lots methods.

To explain in detail the process can be carried out by following the steps given below:

- Assign serial numbers to each of the sampling units in the population and prepare the sampling frame. For example, if there are thousand units in a population, begin assigning number 1 and continue up to 1000.

- Determine the sample size: If the researcher wants 100 units from the sampling frame of 1000, then the researcher may either draw out 100 numerical figures through drawing lots. Otherwise, the researcher can use the standard random number table provided in statistical textbooks and accordingly select the first 100 sample units.

3.3.2 SYSTEMATIC SAMPLING WITH A RANDOM START

Systematic sampling with a random start is carried out by selecting every n^{th} unit. For example, every fifth or 10^{th} or 20^{th} unit is picked up as the case may be. This technique is applied to generate well spread out samples, since the general tendency in any population is that the nearer the units the similar the characteristics. Thus, if the researcher intends to select 100 sample size from the population of 100, the systematic sampling may be every 10^{th} unit. If the random start beings say number 16, the selection would be 16, 36, 46 and so on until it reaches the last selection number 6.

In this technique, two associated concepts are sampling ratio and sampling interval. Sampling ratio is the ratio between population and desired sample size. In case our sample size is 100 and population is 1000 the sampling ratio is 1 : 10, or if the sample size is 100 in the population of 4000, then the sampling ratio is 1: 40. The sampling interval means the constant interval between every unit selected as sample. In the first example when the population is 1000 and sample size is to be 100, the sample interval would be 10.

3.3.3 STRATIFIED SAMPLING

Stratified Sampling is not an exclusive method from the previous two, instead it combines and modifies to make it suitable for more heterogeneous population. The stratified sampling method starts by organizing homogeneous subsets within the larger population and selects proportional sample from each of the subsets, applying either simple random sampling or systematic sampling techniques. Human samples unlike inanimate objects are complex characters and differ in number of ways even in what is known to be the most homogeneous of human groups. It is because of this reason, whenever measuring human behavior is undertaken applying stratification sampling is advocated.

To generate stratified sample, the researcher first of all must specify clearly distinguishable subgroups with specified demarcations. In case the researcher wants to study a village, the subgroups may be based on male, female, or education, income and social status. After specifying different variable, the researcher must prepare the sampling frame for each subgroup. Then the next step involves applying either simple random method or systematic sampling with random start method to select the representative sample proportionate to their respective subgroups population.

Stratified sampling in a village

	Education	Income	Social status
Male	Subgroup 1	Subgroup 3	Subgroup 5
Female	Subgroup 2	Subgroup 4	Subgroup 6

As seen in the table above if a village is the population for study, the subgroups in the village are based on gender, education, income and social status. The researcher then will take representative sample from each of the subgroups according to their proportionate size in the overall population.

3.3. 4 MULTISTAGE CLUSTER SAMPLING

In the event of the researcher taking a very population for study, for example, the entire population of Assam, it would be very difficult to prepare a sampling frame for such huge population. In this situation, multistage cluster sampling is applied. Multistage cluster sampling begins by applying simple random sampling or systematic sampling of subgroups or technically called clusters within the larger population, in our case, it may be districts or blocks in Assam, followed by second stage of clusters of villages or towns within the blocks as subgroups and finally sampling frame is prepared from the smaller subgroups and final sample is selected for any study. The number of stages may would vary for different population types. Based on samples selected at different stages, the

samples selected at the first stage is called primary sampling units, at the second stage the samples selected are called, secondary sampling units and final sampling units selected at the end are called final sampling units.

3.4 NONPROBABILITY SAMPLING METHODS

Nonprobability sampling methods employ nonrandom selection methods and therefore cannot ensure a representative sample. In the case of Probability sampling representativeness and likelihood of each sampling units having a probability of being selected for the sample made it scientific and subsequently the findings of the sample can be generalized to the entire population. In the case of Nonprobability sampling generalizing the findings to the population becomes problematic. This approach does not need to prepare sampling frame of the parent population to generate representative sample. Therefore, the usage of Nonprobability sampling is recommended only in certain types of research where the need to generalize is less or the possibility of preparing sampling frame is dismal. The research objectives do not require randomness and instead intentionally picks up a particular group or sample for the study.

Some the common sampling techniques used under Nonprobability sampling methods are: purposive sampling, convenience sampling and quota sampling.

3.4.1 PURPOSIVE OR JUDGMENTAL SAMPLING

In purposive sampling it is the judgment of the researcher as to who can provide the best information to achieve the objectives of the study. Whenever the researcher applies a case study method or wants to selectively study specific target groups, he or she directly selects a group by excluding similar groups. The researcher only goes to those people who in his/her opinion are likely to have the required information and willing to share it. In such cases the researcher does not wish to generalize the findings beyond the target group. To illustrate this method, in case the researcher wants to study the effectiveness of communication strategies on de-addiction campaigns, he or she may purposively select some of the cases where the campaign is undertaken.

3.4.2 CONVENIENCE SAMPLING

Convenience sampling is also carried out without enumerating the population into sampling frame, instead the researcher selects nonrandomly those readily available as the time and location chosen by the researcher. Convenience sampling cannot be considered representative and do not reflect the characteristics of the entire population, this method is considered unscientific and cannot be generalized.

This sampling is used only when the researcher want to find some phenomenon within the selected sample and not the population or the universe. News reporters standing in the street corners and speaking to the passersby on some issue to find out immediate reaction of the public is one common example of convenience sampling.

3.4.3 QUOTA SAMPLING

Quota sampling is similar to stratified sampling but would not have the sampling frame and the exhaustive list of all target units. However, unlike purposive and convenience sampling it does not leave out the option of representative sample and attempts to generate representative sample with certain limitation in comparison to probability sampling methods. In the quota sampling the researcher develops quota table of different subgroups within the larger target population. The researcher will stratify the population into gender, educational level, income, age, and ethnic origin, geographical region or such variables. The subgroups also must reflect the proportionate size within the population. Based on the proportionate size of the subgroup the researcher selects sample size according to the subgroup table. The sample units from the subgroups are not listed in the sampling frame and randomly selected, but selected based on the convenience of accessibility of the sample units and complete sample size as per the sampling quota assigned to each subgroup.

3.4.4 SNOWBALL SAMPLING

Snowball sampling is the process of selecting a sample using a network. It begins with few individuals are groups or organizations from whom the information is gathered. These people are then requested to refer to other people from the same information is gathered. The second group are then requested to refer to more people and thus goes the

chain of samples resulting into snowball type of more and more sample until the researcher has reached the predetermined sample size.

This technique is especially useful when the researcher has little contact with the group he/she wants to study. The researcher only needs to make contact with very few initially who then direct him/her to more people. There is a possibility of bias in this method, if the individuals or groups refer to only with certain kind of predisposition or viewpoints.

3.5 SAMPLE SIZE

There are no fixed rule on sample size, depending on the purpose sometime large sample is advisable, but in some cases even a single sample if it is information rich is sufficient. What is the criteria to work out the right sample size? How many cases one needs to take to study a problem without making sampling error? The decision on sample size begins with these questions. Any decision on exact sample size depends on factors like the type of research question, and what kind of data are required and finally what they want to do with the findings. Some of guiding factors on sample size depends following principles of sampling:

- In most cases where sampling is done there will be difference between the sample statistics and the population parameters, which is attributable to the selection of sample units.
- The greater the sample size, the more accurate will be the estimate of the true population parameters.
- The greater the difference in the variable under study in a population, for a given sample size, the greater will be the difference between the sample statistics and the true population parameters.

As per the principles of sample the main concern is understanding the characteristics of the population. In order to infer the characteristics it is important the accuracy level at every stage, reduction of bias and increase in the confidence level of inference is needed. To offset any sampling error it is advisable to increase the sampling size which can avoid most the concerns raised in the principles. The findings based on larger sample size have

more certainty than those based on smaller ones. As a rule, the larger the sample size, the more accurate will be the findings.

The greater the variation in the sample the greater will be the variation in the population, therefore, it is essential to have sufficiently large size of sample to include all the heterogeneous groups in the selection.

3.6 SAMPLING IN QUANTITATIVE METHOD

Quantitative methods essentially generalize the finding therefore the sample must be representative and probability sampling methods, whereas qualitative methods do not intend to generalize the findings and thus the need for representative sampling is minimal. Quantitative data gathering starts with counting of units or measurement of quantities, for example, if you collect information on the viewers of a specific television show in your town, one would get figures like 315 or so on. The figure does not reveal much, what is needed is the demographic data like the age breakup, the gender, ethnic origin, economic class etc. These data can be collected in numerical figures. But not all of them will have values. To illustrate further, the data on age may have values like 18, 20, 23, 30, 21, 40 etc, the number reflects the younger and older ages, whereas the data on gender may take numerical value like all females are enlisted as numerical 1 and all males may be entered as numerical 2. Here either 1 or 2 do not have values.

All numerical figures in data collection therefore take the following values; Nominal numbers, ordinal numbers, interval and ratio. As mentioned in the example above assigning number to gender is only for purpose identifying but not to have values. Ordinal numbers have values attached to them, for example, a person liking a particular television programme may strongly like to almost disliking it the numerical assignment of answers therefore will have values.

Thus while choosing the sampling method for quantitative data collection the following points must be kept in mind:

- The research wants to generalize to the population and therefore the sample must be necessarily representative and need to use one of the probability sampling methods, for example find out the most popular candidate for chief

minister or prime minister through online survey will be mistake, as it would only represent people who can afford internet connection and leaves out majority of the voters.

- Random sampling methods are predictable. When a research such as opinion poll to predict the number of seats a political party may win must be based on random selection of samples. Similarly, most marketing research is intended to predict the quantum of sale. They should be based on random sample and not convenience or purposive sample which will mislead the prediction.
- Random sampling methods are repeatable and verifiable, which means the results of the actual outcome can be compared to the research results to match the figures for self correction of repetition of the same measurement tools in some other areas.
- Probability sampling is the best approach for quantitative methods. Quantitative methods uses complex statistical tools for interpretation and inferences, such as standard deviation, correlation coefficient, and chi square tests to prove or disprove hypotheses or measurement of significance of relation between dependent and independent variables.

3.7 SAMPLING IN QUALITATIVE METHOD

The concerns of the qualitative methods are different from quantitative methods. The understanding of the phenomena from the subjective and respondent's perspective in itself is given more importance than to predictability or generalisability. The kind of data collected is about human behavior, attitude, opinion, and meanings people attach to objects and people around them. The emphasis is on qualitative data like gender sensitivity of a television programmes rather than viewership. The qualitative data collected help us to understand the social, political, cultural and economic context indepth of a phenomenon. The qualitative approach is interested in the process itself rather than the outcome, for example how social change occurs, or how behavior change occur by the intervention of communication. The research design constructed provided lot of flexibility and provisions of change at the field. Therefore, Nonprobability sampling methods are commonly used in qualitative researches.

The qualitative approach adapts the following principles while selecting its field of inquiry:

- Human beings are complex social agents and are not predictable like objects.
- Randomized events are irrelevant in social life, therefore the issue for study are intentionally chosen to look at the dynamics of complex socio-cultural dimensions.
- Probability sampling techniques are time consuming and also financially more costly, and above all the findings may have limited or no value for different socio-cultural groups.
- Nonprobability sampling is the best approach, as the researcher can intentionally select information-rich samples in the field rather than following sampling frame methods.

SAMPLE QUESTIONS

- What is a sample? Explain various concepts related to sampling.
- What is the difference between selecting a scientific and non-scientific basis of sampling?
- Briefly state Probability sampling techniques and the procedure to generate a sample
- Describe various Nonprobability sampling techniques and the process of generating sample using those techniques.
- What are the advantages and disadvantages of studying a phenomena using a sample instead of the population?
- Explain the process of using simple random sampling methods in communication research.

SUGGESTED READINGS

Neuman, W. Lawrence (2007), Basics of Social Research: Qualitative and Quantitative Approaches, Second Edition, Boston: Allyn and Bacon.

Smith, Mary John (1988) *Contemporary Communication Research Methods*, Belmont:
Wadsworth.

UNIT 4: DATA ANALYSIS AND INTERPRETATION

4.1 Objectives

4.2 Introduction

4.3 Primary & secondary data

4.4 Qualitative and Quantitative data analysis

- Coding and Tabulation
- Validity and Reliability
- Further Readings
- Probable Questions

• OBJECTIVES

After reading this unit, you will be able to –

- explain the basic concepts on data and its sources
- discuss the qualitative and quantitative data analysis
- enumerate the coding and tabulation of research data
- discuss the concept of validity and reliability

• INTRODUCTION

In this age of challenge and competition, research has assumed much importance greater for all fields, be it the business world or the corporate world or the communication world. Research has now become an integral part of all the areas of the human activities. It has however occupied the realm of human understanding in some form or other from times in memorial. The thirst for new areas of knowledge and the human urge for solutions to the problems have developed a faculty for search and research.

In this unit, we will discuss about the basic concepts on data and its sources or types- primary and secondary data. We will also enumerate about the qualitative and quantitative data analysis. Here we will introduce you to the concept of coding and tabulation of research data. We hope that after going through this unit, you will have the basic understanding of the concepts of research data, quantitative and qualitative data, coding and tabulation and finally validity and reliability.

4.3 PRIMARY & SECONDARY DATA

In a research process data is the most important element without which we cannot pursue a research. Say, for instance, in a communication process a sender sends information to a receiver. The sender encodes the information in the form of signals and on the other end the receiver decodes the message and sends it to the destination. Here, message or information represents data. Data is required to make a decision in any situation. The researcher is faced with one of the most difficult problems of obtaining suitable, accurate and adequate data.

Data can be defined as facts relating to people like places, events or things which can be represented by alphabets or numbers. Any kind of factual information like statistics or measurements that are used for reasoning or calculation is known as data. In research, there are mainly five types of data. They are numeric data/ non-numeric data or both. It means data in numerical or non-numerical or combination of both. The second type of data is in form of text. It means data in words like paragraph of a book, journal etc. Another type of data is picture or image. For instance a photograph, map of a country, fingerprints etc. The fourth type of data is audio data. It includes speeches, songs, telephone conversations and many more. The fifth type of data is audio visual or video data. It can be a moving picture or dubbing of a particular movie. Data can be read by using various input devices.

Special care must be exercised while collecting data because the quality of the research results depends upon the reliability and authenticity of the data. For example, suppose, you are a reporter of a vernacular news daily. The managing director of the news paper has asked you to find out why the circulation of the paper

has decreased since last six month in your district. The director asked you to present a report which includes the facts and figure along with your journalistic tasks.

Now, what will you do? You have to collect the relevant information to make an analysis for the above mentioned problem. Therefore, the information which is collected from various sources and which can be expressed in quantitative form for a specific purpose is called data. To find out a solution of a research problem or for in the policy making or decision making process the input must be appropriate. This depends on the appropriateness of the method chosen for data collection. So, data is the heart and soul of a research.

The data may be classified as *primary* and *secondary* data. The primary data are the first hand data which are collected for the first time for a specific purpose. Such data are published by authorities who themselves are responsible for their collection. Primary data is the original data. Primary data serves as the foundation of a research analysis. It is original in character and more adequate and accurate. It can be collected by using various methods like personal interviews, indirect oral interviews, correspondents, questionnaire method and schedules through enumerators. Primary data helps to analyse new research question which was otherwise not dealt with. It provides fresh and updated information thus providing new impetus to a research. However primary data in one hand becomes secondary in the hands of others.

The secondary data on the other hand are data already available that is data already collected and analysed by someone else. It may either be published or unpublished. It depends on the researcher whether the secondary data can be utilized or not depending on the credibility of the sources from which it was collected. Secondary data in published forms can be books, journals, newsletters, government records etc. while the unpublished forms can be diaries, letters or some biographies in unpublished format. Since secondary data is already available due to some prior research activity, it is cost effective as well as time and energy saver. A researcher has to keep certain vigilance while using the secondary data as the data collected by somebody else may be collected from appropriate sources. He/ She has to look into reliability, accuracy and suitability of the data before using secondary data. But if the

data is suitable and collected from authentic sources, a researcher should use secondary data as it is readily available and it saves a lot of time and energy.

4.4 QUALITATIVE AND QUANTITATIVE DATA ANALYSIS

Qualitative research is in-depth research on a particular subject. It asks broad questions and collects word data from participants. Qualitative data analysis is the analysis of such descriptive data collected from the primary sources. It is useful in generating important variables, relationships, causes, reasons or possible suggestions. It is non numeric data which allows the respondent to interpret freely with the researcher and provides scope for detailed analysis of a certain research question. This kind of data analysis helps in extensive studies, to study the behavior of the population or reaction of the government and non government organizations during certain situations like crisis. It helps the researcher to understand the culture, or ideas, views and opinions of the common people in their own words. Structured questionnaires limit the scope of illustrative analysis of a certain issue. Open ended questions are used in qualitative research which allows the respondent to respond in a detailed way. The data collected in this method are generally in form of notes, documents, audio or video recordings. Interpretation and analysis of this kind of data requires studying, observing and reviewing the data. It can be summarized, reduced to codes or presented in tables.

Quantitative data is any data that is in numerical form such as statistics, percentages, etc. In layman's terms, this means that the quantitative researcher asks a specific, narrow question and collects a sample of numerical data from participants to answer the question. It is objective, in numbers or measurable and can be presented in tables, diagrams etc. It implies structured as well as close ended questions. The researcher analyzes the data with the help of statistics. The researcher hopes the numbers will yield an unbiased result that can be generalized to some larger population. Quantitative data can be procured from various sources and methods like sample surveys, administrative records, transactions, records of production, census etc. The

nature of the data and methods of analysis makes a research qualitative or quantitative. Quantitative data is collected in numeric forms which is analysed using tools like statistics, graphical presentations, tables etc. It is however formulated after the end of data collection or field surveys unlike qualitative data which can be formulated simultaneously with the collection of data from the interviewees.

4.5 CODING AND TABULATION

Coding and tabulation are two of the important steps of data processing the other three being editing of data, classification of data and data diagrams. Coding generally refers to translating of answers into numerical values or assigning numbers to the various categories of a variable to be used in data analysis. In fact it is the process by which data/responses are organized into classes/categories and numerical or other symbols are given to each item according to the class in which it falls. The numerical score or symbol is called a code, and serves as a rule for interpreting, classifying, and recording data. Two basic operations are involved in the coding process – (i) deciding the categories to be used and (ii) allocating individual answers to them. However, these categories must be formulated keeping in mind the research problem and must also be exhaustive of the data, mutually exclusive and uni-directional. Coding is usually done with the help of 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. Coding helps to perform the data analysis function in a much better and efficient manner provided utmost care is taken to keep it error free or errors reduced to the minimum level while assigning the codes.

It is expected that coding decisions should generally be taken at the stage when the questionnaires are being designed. This is basically because at that stage it is possible to pre-code the questionnaire choices. This in turn is helpful for computer tabulation as one can easily punch from the original questionnaires. However, in case of hand coding, some form of standard method is followed where one such method is to code in the margin with a coloured pencil. In another method, the data is transcribed from the questionnaire to a coding sheet.

When raw data is summarized and displayed in compact form for further analysis, it is known as tabulation. Thus preparation of tables is a very important step of data analysis under research. Tabulation of data can be accomplished manually, mechanical or by way of electronic method. However, choice is largely made on the basis of the size and type of study, alternative costs, time pressures and the availability of computers and computers programmes. If number of questionnaires to be assessed is quite few in number, then hand tabulation yields satisfactory results.

Tabulation of data has basically carried out keeping in views the following objectives-

(i) to carry out investigation (ii) to do comparison; (iii) to locate omissions and errors in the data; (iv) to use space economically; (v) to study the trend; (vi) to simplify data; (vii) to use it future reference.

A typical research table consist of the following parts – (1) Table number (2) Title of the table (3) Caption (4) Stub (row heading) (5) Body (6) Head note (7) Foot note

A table number is given at the top of the table which distinguishes it from other tables. Then a well designated title is provided for the table identifying the contents. The columns and rows must be given clear captions and stubs. The body of the table mainly consists of the numerical data. Numerical should be expressed to a consistent number of decimal places that is determined by the precision of measurement. Table head notes contain general information concerning the table title or the table itself that should be read before the rest of the table is observed. Similarly to the table head notes, there are also table footnotes which should be aligned to the left side of the column and written in 10 pts. Table footnotes refer to specific items within the tables.

Generally the following steps are followed in the process leading to data tabulation-

- Categorization : The appropriate categories for coding the information that have been collected have to be defined.
- Coding : Assigning codes to the answers provided by the respondents is another step towards tabulation of data
- Creation of data file : The third stage calls for creation of the data file whereby data is entered into the computer
- Checking of errors : In order to minimise the risk of errors in the data file, one has to perform a simple tabulation analysis in coding or data entry. Once the errors have been identified, data may be recoded to collapse categories or combine or delete responses.
- Generation of new variables : Computation of new variables can be done by data manipulations by way of multiplication, summation or by other methods.
- Data Subclasses are weighted : Weights are often used to adjust the representation of sample subgroups so that they match the proportions found in the population.
- Tabulation : Finally, the responses to each variable that have been included in the analysis will be summarized.

Tabulation may thus be defined as the systematic presentation of numerical data in rows or/and columns according to certain characteristics. It expresses the data in concise and attractive form which can be easily understood and used to compare numerical figures.

4.6 VALIDITY AND RELIABILITY

Sound measurements must meet the tests of validity, reliability and practicability. Reliability is the degree to which an assessment tool produces stable and consistent results. When we call someone or something reliable, we mean that they are consistent and dependable. It refers to the consistency of a measure. A test is considered reliable if we get the same result repeatedly. For a test to be reliable, it

needs to be valid. Just because a test has reliability does not mean that it has validity. Validity refers to whether or not a test really measures what it claims to measure. In some cases, a test might be reliable, but not valid. It is vital for a test to be valid in order for the results to be accurately applied and interpreted. Validity is the extent to which differences found with a measuring instrument reflect true differences among those being tested.

There are three types of validity:

- Content validity,
- Criterion-related validity and
- Construct validity.

Content validity is the extent to which a measuring instrument provides adequate coverage of the topic under study. If the instrument contains a representative sample of the universe, the content validity is good. Criterion-related validity relates to the ability to predict some outcome or estimate the existence of some current condition. Construct validity is the most complex and abstract. A measure is said to possess construct validity to the degree that it confirms to predicted correlations with other theoretical propositions.

A measuring instrument is reliable if it provides consistent results. Reliable measuring instrument does contribute to validity, but a reliable instrument need not be a valid instrument. For example, a scale that consistently overweighs objects by 5 kilograms is a reliable scale, but it does not give a valid measure of weight. A valid instrument is not always reliable. Accordingly, reliability is not as valuable as validity, but it is easier to assess reliability in comparison to validity. There are two aspects of reliability, namely, stability and equivalence. The stability aspect is concerned with securing consistent results with repeated measurements of the same person and with the same instrument. The degree of stability is determined by comparing the results of repeated measurements. The equivalence aspect considers

how much error may get introduced by different investigators or different samples of the items being studied.

Validity and reliability are two factors that any researcher should be concerned about while designing a study, analysing results and judging the quality of the study.

4.7 SUGGESTED READINGS

Textbook(s)

- Kaul, Lokesh. *Methodology of Educational Research* (Bikash, 2001).
- Patnaik, Asit Kr. *Research Methodology in Social Sciences* (Commonwealth, 2001).

Reference book(s)

- Sharma, S.R. *Research in Mass Media* (Radha Publishers, 1996).

4.8 PROBABLE QUESTIONS

- Define data. What are the various types of data. Discuss the sources of data.
- What are the differences between Qualitative and Quantitative data.
- Discuss the process of Coding and Tabulation of research data.
- Discuss the importance of Validity and Reliability

UNIT 5: REPORT WRITING

5.1 OBJECTIVES

After going through this unit you will be able to

- Comprehend the meaning of citation and style guides
- Explain the use of APA and MLA style guides
- Discuss on how to prepare a research report
- Enumerate the ethical issues in research

5.2 INTRODUCTION

In the previous unit we have discussed on the concept of data, primary and secondary sources of data, qualitative data analysis and quantitative data analysis. In the unit we have also mentioned the provisions of various data analysis, coding and tabulation. The concept of validity and reliability has also been explained in the unit.

In this unit we are going to discuss on how to write a research report. The unit deals with the preparation to write a report and use of the citation styles. In this unit we are discussing mainly the style guides of American Psychological Association and Modern Language Association. We will get an idea on the ethical issues of research in the end of this unit.

5.3 STYLE GUIDES

Citation is one of the important elements in a research. Acknowledging the sources is always crucial in doing honest academic work. In a book, published by The University of Chicago Press, Charles Lipson has mentioned three basic reasons to cite the materials a researcher is using. These are as follows-

- To give credit to others' work and ideas, whether you agree with them or not. When you use their words, you must give them credit by using both quotation marks and citations.
- To show readers and materials on which you base your analysis, your narrative, or your conclusions.
- To guide readers to the materials you have used so that they can examine it for themselves. Their interest might be to confirm your work, to challenge it, or simplify to explore it further.

Citation helps to increase the credibility to a particular research. Citations fully disclose the sources of a researcher. Citations in the text of a research paper point to the alphabetical works cited list that appears at the end of the paper. Together, these references identify and credit the sources used in the paper and allow others to access and retrieve these materials. To cite a secondary data a researcher can adopt different style guide or citation styles. The major citation styles are –

- Chicago (or Turabian), used in many fields
- MLA, it is basically used for the humanities
- APA, it is one of the most popular citation styles now-a-day. It is used in social sciences, education, engineering and business.

Several sciences has also developed their own distinctive styles

- CSE, for the biological sciences
- AMA, for the biomedical sciences, medicine and nursing
- ACS, For chemistry
- AIP, for physics, it is also used in the disciplines of astrophysics and astronomy
- AMS, for mathematics and computer sciences

As you are a student of Journalism and Mass Communication you have to use mainly the APA style of citation. Earlier the researchers of the social sciences primarily used the Chicago manual. It is still one of the popular style guides among the researchers. For the research work of the humanities researchers prefer MLA citation style. Let us discuss the APA and MLA citation styles the following subsections.

5.3.1 APA

APA citation is one of the most popular citation styles in the humanities and the social sciences discipline. APA stands for American Psychological Association. According to the 6th edition of publication manual of the American Psychological Association the information may be cited within the text and in a reference list at the end of the paper.

To cite a book, the order may be as under-

- Name of the author, surname first
- Year of publication in bracket
- Title of the book in Italics
- Place and publisher of the book

For example-

Dutta, A., & Ray, A. (2011). *Science communication in Assam*. Guwahati, DVS Publisher.

General rules

- **Formatting:** The preferred APA font is a serif typeface such as Times New Roman with 12-point size. Double-space between all lines of text, including the reference list. Have uniform margins of at least 1 inch (2.54 cm) on all sides.

- Arrange reference list entries in **alphabetical order** by the surname of the first author or by title if there is no author. Use only the initial(s) of the author's given name, not the full name, with a space between the initials.
- **Capitalize** only the first letter of the first word in the article or book title. Proper nouns are also capitalized as well as the word following a colon (subtitle). Journal titles should have every major word capitalized.
- References cited in the text must appear in the reference list and vice versa. The only exceptions to this rule are personal communications and secondary sources, which are cited in the text only and are not included in the reference list.

LET US KNOW IN DETAIL

The Trexler Library has given a comprehensive guideline to use the APA style of citation. The following are the guidelines to use this citation style-

Citations in the text

APA uses the author-date method of citation. The last name of the author and the date of publication are inserted in the text in the appropriate place. When referencing or summarizing a source, provide the author and year. When quoting or summarizing a particular passage, include the specific page or paragraph number, as well. When quoting in your paper, if a direct quote is less than 40 words, incorporate it into your text and use quotation marks. If a direct quote is more than 40 words, make the quotation a free-standing indented block of text and DO NOT use quotation marks.

One work by one author:

- In one developmental study (Smith, 1990), children learned... OR
- In the study by Smith (1990), primary school children... OR
- In 1990, Smith's study of primary school children...

Works by multiple authors:

When a work has 2 authors cite both names every time you reference the work in the text. When a work has three to five authors cite all the author names the first time the reference occurs and then subsequently include only the first author followed by et al. For example:

First citation: Masserton, Slonowski, and Slowinski (1989) state that...

Subsequent citations: Masserton et al. (1989) state that...

For 6 or more authors, cite only the name of the first author followed by et al. and the year.

- ***Works by no identified author:***

When a resource has no named author, cite the first few words of the reference entry (usually the title). Use double quotation marks around the title of an article, chapter, or Web page. Italicize the title of a periodical, book, brochure, or report. For example:

The site seemed to indicate support for homeopathic drugs ("Medical Miracles," 2009).

The brochure argues for homeschooling (*Education Reform*, 2007).

Treat reference to legal materials such as court cases, statutes, and legislation like works with no author.

- ***Two or more works in the same parenthetical citation:***

Citations of two or more works in the same parentheses should be listed in the order they appear in the reference list (i.e., alphabetically, then chronologically).

Several studies (Jones & Powell, 1993; Peterson, 1995, 1998; Smith, 1990) suggest that...

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- **Specific parts of a source**

Always give the page number for quotations or to indicate information from a specific table, chart, chapter, graph, or page. The word page is abbreviated but not chapter. For example:

The painting was assumed to be by Matisse (Powell, 1989, Chapter 6), but later analysis showed it to be a forgery (Murphy, 1999, p. 85).

If, as in the instance of online material, the source has neither visible paragraph nor page numbers, cite the heading and the number of the paragraph following it. This allows the reader to locate the text in the source. For example:

The patient wrote that she was unimpressed by the doctor's bedside manner (Smith, 2006, Hospital Experiences section, para. 2).

Example:

Lindahl, Frederick. "Activity-Based Costing Implementation and Adaptation." *Human Resource Planning* 20.2 (June 1997): n. pag. *LexisNexis Academic*. Web. 28 Feb. 2009.

CITATIONS IN A REFERENCE LIST:

In general, references should contain the author name, publication date, title, and publication information. Include the issue number if the journal is paginated by issue.

For information obtained electronically or online include the DOI:

DOI - a unique alphanumeric string assigned to identify content and provide a persistent link to its location on the internet. The **DOI** is typically located on the first page of the electronic journal article near the copyright notice. When a DOI is used in your citation, no other retrieval information is needed. Use this format for the DOI in references:

doi:xxxxxxx

If no DOI has been assigned to the content, provide the home page URL of the journal or of the book or report publisher. Do not insert a hyphen if you need to break a URL across lines; do not add a period after a URL, to prevent the impression that the period is part of the URL.

In general, it is not necessary to include database information. Do not include retrieval dates unless the source material has changed over time.

Book:

•

Strunk, W., Jr., & White, E. B. (1979). *The guide to everything and then some more stuff*.

New York, NY: Macmillan.

Gregory, G., & Parry, T. (2006). *Designing brain-compatible learning* (3rd ed.). Thousand

Oaks, CA: Corwin.

• ***Chapter of a Book:***

Bergquist, J. M. (1992). German Americans. In J. D. Buenker & L. A. Ratner (Eds.),

Multiculturalism in the United States: A comparative guide to acculturation and

ethnicity (pp. 53-76). New York, NY: Greenwood.

- ***Journal Article with DOI:***

Paivio, A. (1975). Perceptual comparisons through the mind's eye.
Memory & Cognition, 3, 635-647. doi:10.1037/0278-6133.24.2.225

Journal Article without DOI (when DOI is not available):

Becker, L. J., & Seligman, C. (1981). Welcome to the energy crisis.
Journal of Social Issues, 37(2), 1-7.

Hamfi, A. G. (1981). The funny nature of dogs. *E-journal of Applied Psychology*, 2(2), 38-48. Retrieved from <http://ojs.lib.swin.edu.au/index.php/fdo>

Online Newspaper Articles:

Becker, E. (2001, August 27). Prairie farmers reap conservation's rewards.
The New York Times. Retrieved from <http://www.nytimes.com>

- ***Encyclopaedia Articles:***

Brislin, R. W. (1984). Cross-cultural psychology. In R. J. Corsini (Ed.),
Encyclopedia of psychology (Vol. 1, pp. 319-327). New York, NY: Wiley.

Developmental genetics. (2005). In *Cambridge encyclopedia of child development*. Retrieved from http://0-www.credoreference.com.library.muhlenberg.edu:80/entry/cupchilddev/developmental_genetics

- ***Technical and Research Reports (often with corporate authors)***

Hershey Foods Corporation. (2001, March 15). *2001 Annual Report*.
Retrieved from
<http://www.hersheysannualreport.com/2000/index.htm>

•

- ***Book Reviews:***

Dent-Read, C., & Zukow-Goldring, P. (2001). Is modeling knowing?
[Review of the book
Models of cognitive development, by K. Richardson]. *American Journal of Psychology*, 114, 126-133.
NOTE: For articles that have a DOI, see Journal Article with DOI example.

- ***Data Sets:***

Simmons Market Research Bureau. (2000). *Simmons national consumer survey* [Data file].
New York, NY: Author.

- ***Blog post:***

Lincoln, D. S. (2009, January 23). The likeness and sameness of the ones
in the middle. [Web log post]. Retrieved from
<http://www.blogspot.com/lincolnworld/2009/1/23.php>

Website with no author or date of publication:

Census data revisited. (n.d.). Retrieved March 9, 2009, from Harvard,
Psychology of
Population website, <http://harvard.edu/data/index.php>

Do not include retrieval dates unless the source material may change over time.

If no DOI has been assigned to the content, provide the homepage URL.

5.3.2 MLA

Like APA, MLA is also one of several styles of academic writing. MLA is the Abbreviation of Modern Language Association. MLA establishes values for acknowledging sources used in a research paper. MLA citation style uses a simple to part, parenthetical documentation systems for citing sources.

To cite a book, the order may be as under-

- Name of the author/s, surname first then full first name
- Title of the book in Italics
- Place and publisher of the book
- Year of publication
- Medium of publication

For example-

Dutta, Ankuran, and Ray, Anamika. *Science communication in Assam*.
Guwahati : DVS Publisher, 2011. Print.

General rule

- In MLA style, authors place references to sources in the paper to briefly identify them and enable readers to find them in the works cited list.
- The information needed to identify a source may only be given. Usually the author's last name and a page reference suffice.
- Information in the parenthesis should be complement the information given in the text but should not be repeated. If the researcher and author's name is included in a sentence, he does not need to repeat in the parenthetical treatment.

- Electronic and online sources are cited just like print resources in parenthetical references. If an online source lacks page numbers, omit numbers from the parenthetical references. If an online source includes fixed page number, page numbers or section numbering, such as numbering of paragraphs, cite the relevant numbers.

LET US KNOW IN DETAIL

The Trexler Library has given a comprehensive guideline to use the MLA style of citation. The following are the guidelines to use this citation style-

In-Text Parenthetical Documentation

Parenthetical documentation, used in place of footnotes in the MLA style, typically includes the author's last name, if known, or the first keyword of the title of the work, followed by a page number, if known. Parenthetical references should be brief and few, just enough to for clarity and accuracy.

Examples:

(Smith 10)

(Smith)

("Weather" 10)

Works Cited:

Book with One Author:

Frye, Northrop. *Anatomy of Criticism: Four Essays*. Princeton: Princeton UP, 1957. Print.

Book with Multiple Authors:

Bondanella, Peter, and Julia Conway, eds. *Dictionary of Italian Literature*. Westport: Greenwood, 1979. Print.

Chapter/Work from a Book or Anthology:

Thurschwell, Pamela. ““That Imperial Stomach Is No Seat for Ladies’: Henry James, the First World War and the Politics of Identification.” *Modern Sexualities*. Ed. Hugh Stevens. Manchester: Manchester UP, 2000. 167-83. Print.

Journal Article with Volume Number Only:

Spear, Karen. “Building Cognitive Skills in Basic Writers.” *Teaching English in the Two Year College* 9 (1983): 91-98. Print.

Journal Article with Volume and Issue Number:

Monk, Patricia. “Frankenstein’s Daughters: The Problems of the Feminine Image in Science Fiction.” *Mosaic* 13.3-4 (1980): 15-27. Print.

Article from a Newspaper:

McKay, Peter A. “Stocks Feel the Dollar’s Weight.” *Wall Street Journal* 4 Dec. 2006: C1+. Print.

Article from a Popular Magazine:

Helem, Lisa. “Child’s Play? No Way!” *Newsweek* 19 July 2004: 9. Print.
Encyclopedia Entry or Article in a Reference Book:

Signed:

Robinson, David J. "Lima." *World Book Encyclopedia*. Vol. 12. Chicago: World Book, 2001. Print.

Unsigned:

"Graham, Martha. *Who's Who of American Women*. 13th ed. 1983-84. Print.

Book Review:

Schneller, Robert J., Jr. Rev. of *A History of the Confederate Navy*, by Raimondo Luraghi. *American Historical Review* 102 (Oct 1997): 1232. Print.

Article Reprinted in a Collection:

Miller, Jeanne-Marie A. "Odets, Miller, and Communism." *CLA Journal* 29.4 (1976): 484-93. Rpt. in *Contemporary Literary Criticism*. Ed. Deborah Stanley. Vol. 98. Detroit: Gale, 1997. Print.

Video:

The Golden Bowl. Dir. James Cellan Jones. Perf. Cyril Cusack, Barry Morse, Jill Townsend, Daniel Massey, and Kathleen Byron. Acorn Media, 1999. Film.

Personal Interview:

Pei, I. M. Personal interview. 22 July 1993.

Government Document:

United States. Cong. Joint Committee on the Investigation of the Pearl Harbor Attack. *Investigation of the Pearl Harbor Attack*. 79th Cong., 2nd sess. Washington: GPO, 1946. Print.

Website:

Form:

Authors or editors (if known). "Title of section (if using a section of a larger site)." *Title of overall site*. Version or edition (if known). Publisher or sponsor of site (if not available use "N.p."), Date of publication (if not available use "n.d."). Medium of publication (Web). Date of access.

Example:

Landow, George, ed. *Contemporary Postcolonial and Postimperial Literature in English*. Brown University, 2002. Web. 25 June 2009.

Website with Print Publication Data Available

Form:

Authors or editors (if known). "Title of chapter or section (if available)." *Title of publication*. Place of publication: Publisher, date. *Title of overall site*. Medium of publication (Web). Date of access.

Example:

Heim, Michael Henry, and Andrzej W. Tymowski. *Guidelines for the Translation of Social Science Texts*. New York: ACLS, 2006. *American Council of Learned Societies*. Web. 15 May 2008.

Web-Based Journal Article (appearing on the journal's own website)

Form:

Author. "Article title." *Journal Title* Volume.Issue, if available (Date): pagination (if not, use "n.pag."). Medium of publication (Web). Date of Access.

Example:

Nater, Miguel. "El beso de la Esfinge: La poética de lo sublime en *La amada inmóvil* de Amado Nervo y en los *Nocturnos* de José Asunción Silva." *Romanitas* 1.1 (2006): n. pag. Web. 5 June 2009.

Article from a Subscription Database:

Form:

Author. "Article title." *Journal Title* Volume.Issue (Date): original pagination if known (if not, use "n. pag."). *Database name*. Medium of publication (Web). Date of Access.

Example:

Arias, Judith H. "The Devil at Heaven's Door." *Hispanic Review* 61.1 (Winter 1993): n. pag. *Academic Search Premier*. Web. 28 Feb. 2009.

Comparison of the both Citation styles:

	APA	MLA
Purpose	Focuses on current research and researcher	Focuses on author and pinpoint citations
Subject areas	Education, Communication. Psychology	Language and literature
Header	Running head with title & page number	Last name, with page number
Distinguishing factor	Year of publication is very important here (within 10 years is considered current)	Page numbers for all used material- quotes or paraphrases
Block quotes	Block quot for 40 or more words	Block quote for more than four typed lines

Positives	Research based, simplified numbers	Streamlined; familiar
Reference page title	References	Works cited

5.4 PREPARATION OF RESEARCH REPORTS

In this unit, we have already discussed the important citation styles which are used in academic work. Report preparation is the most important step of a research work. After connecting and analyzing data the researchers has to accomplish the task of drawing inferences followed by report writing. Each research has a purpose and the report could be prepared and read by different public. In the report the researcher has to interpret the data collected in the previous period. Interpretation is essential because of its usefulness and utility of research findings which lies in proper interpretation. It is being considered a basic component of a research process.

C.R Kothari has written in his book Research Methodology that research reports considered a major component of the research study. As the research task remains incomplete till the report has been presented and/or written. Professor Ram Ahuja says in his book that there are five basic ingredients of a research report. These are-

- A clear topic: The topic of the research should be specific. It should not be vague and unspecified.
- A review of literature: A research report should contain a good review of literature. The studies made by others on the relevant topic should be mentioned in the review of literature.

- A research design: Without a research design, researcher cannot complete a research work. It helps to clarify and explain the precise model of the research.
- Analysed data: A good analysis is the fuel for a research. The data collected in the time of research must be analysed and incorporated in the report.
- Conclusions and finding: The finding of the study may be given in the report. It should be accompanied with the suggestions or the recommendations of the researchers.

In the research report, the researcher has to give a logical analysis of the subject matter. After that he has to draw the outlines of the research work. Elliott and Francesco mentioned that outlines are the framework, upon which long written works are constructed. They are an aid to the logical organisation of the material and a reminder of the points to be stretched in the report. After the logical analysis and drawing the final outlines the researcher needs to prepare a rough draft. Then he has to rewrite and polish the rough draft. This step happens to be the most difficult part of all formal writing. Having being completed this important task, the researcher has to prepare the references and final bibliography.

Baker has pointed out six types of research reports. These are:

1. Dissemination in a book form
2. Commissioned research reports
3. Publication in professional journals
4. Presentation before a professional audience
5. Research papers for courses, and
6. Papers prepared for mass media.

Layout is another important element for a good research report. A comprehensive layout of a research report should comprise preliminary pages, the main text or

body and the end matter. In the preliminary pages the researcher has to include the title of the research, the name of the researcher, funding agency or name of the educational institution, acknowledgement, preface, foreword etc. In the preliminary pages the researcher has to incorporate the table of contents followed by a list of tables and illustration. So that anybody interested in reading the report can easily locate the required information in the report.

The main text provides a comprehensive analysis on topic. It is a complete outline of the research report. The main text should have a good introduction, statement of findings, recommendations, results, implications drawn from the results and a summary. At the end of the report few important annexure may be added like bibliography, questionnaires, sample information, mathematical derivations etc. may be annexed in the end part of the report.

- **Ethnical issues in research**

Copyright: Copyright is ethical right exclusive to the provisions of Act, to authorize someone in respect of a work or any part of it, in case of any literary, dramatic, cinematograph, translation or musical work. One has to seek permission from the author in order to use figures, statistics etc. from the published works.

The first Copyright Act was legalized in England in 8 Anne c.19-. Copying or reproducing any material requires authorization from the original author. Authorization can be in the form of a statute or attaining direct permission by issuing a kind of license or any contract. For the purposes of this Act which is exclusive right and subject to the provisions of the Act.

a) In case of any literary, dramatic or musical work, to authorize and doing any of the following Acts in respect of a work or a part thereof. Pushpalata Srivastava has mentioned in her book ‘Copyright in Academic Libraries in Digital Environment’ as follows-

- i) to reproduce the work in any form including storing it by electronic means
- ii) to publish the material
- iii) to issue copies of the work in public
- iv) to produce, translate or publish the work or any part of it
- v) to make any cinematographic film or recording in respect to the work
- vi) to make any adaptation of the work
- vii) to perform the work in public by communicating with loudspeaker or any other instrument to broadcast

b) In case of an Artistic work,

- i) to reproduce the work in any material form including depiction of two dimensional work in three dimensions or vice versa.
- ii) to publish the work
- iii) to include the work in cinematograph film
- iv) to make any adaptation of the work
- v) to communicate the work or issue copies to the public

c) In case of cinematography of a film,

- i) to make a copy of the film or any of its part
- ii) to utilize the sound track associated with the film or make any record of any part of it
- iii) to communicate the film to the public

d) In case of any sound recording,

- i) to make any other sound recording symbolizing it

ii) to sell or provide on hire the copy of the sound regardless if such copies were sold or provided on hire.

iii) to broadcast the sound in public

Infringement of the copyright has been made a criminal offence under Copyright Act, which is punishable with imprisonment for six months which can extend upto three years with a fine ranging from Rs 50,000 to Rs two lacs.

Plagiarism: Plagiarism is using other's work without providing proper attribution or acknowledging his or her work. It had its roots in the Western Civilisation and Greco-Roman Era when authors used to borrow writings and thinking from others. Though this kind of theft did not confront any monetary compensation but reputation was at stake.

According to Judy Anderson, Plagiarism was prevalent not only in Britain and Europe but was a pastime in Americas. In the present scenario, this practice is rampant in many sectors like literary works, journalism, cinema etc. For copyright, piracy and plagiarism; many nations have subscribed to decisions by Berne Convention for the Protection of Literary and Artistic Works of 1886 which was revised in the year 1971. According to this Act, the nations agree to provide protection to foreign works like their own citizens. This agreement includes both moral and financial rights.

SUGGESTED READINGS

Textbook(s)

- Kaul, Lokesh. *Methodology of Educational Research* (Bikash, 2001).
- Patnaik, Asit Kr. *Research Methodology in Social Sciences* (Commonwealth, 2001).

Reference book(s)

- Sharma, S.R. *Research in Mass Media* (Radha Publishers, 1996).

PROBABLE QUESTIONS

- Write a note on academic writing. What are the various types of citation styles?
- What are the differences between APA and MLA style of citation?
- Discuss the process of preparing a report.
- Discuss the importance of ethics in research.