Module for Post-Graduate Diploma in Education Programme

EPS761P:
RESEARCH METHODS IN EDUCATION

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UNIT 1: THE NATURE OF RESEARCH

Introduction:

Research is an essential and powerful tool in leading man towards progress. Without systematic research there would have been very little progress.

John W. Best has rightly said, “The secret of our cultural development has been research, pushing back the areas of ignorance by discovering new truths, which, in turn, lead to better ways of doing things and better products.”

Scientific research leads to progress in some field of life. New products, new facts, new concepts and new ways of doing things are being found due to ever-increasing significant research in the physical, the biological, the social and the psychological fields. Research today is no longer confined to the science laboratory.

Meaning of Research:

Word ‘Research’ is comprises of two words = Re+Search. It means to search again. So research means a systematic investigation or activity to gain new knowledge of the already existing facts. Research is an intellectual activity. It is responsible for bringing to light new knowledge. It is also responsible for correcting the present mistakes, removing existing misconceptions and adding new learning to the existing fund of knowledge. Researches are considered as a combination of those activities which are removed from day-to-day life.

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in intellect and sincere in pursuit of knowledge. But it is not correct to say that the research is restricted to such type of persons, however, it is correct to say that major contribution of

research comes from highly gifted and committed workers. Thus the research is not at all mysterious and is carried on by hundreds of thousands of average individuals.

Research is also considered as the application of scientific method in solving the problems. It is a systematic, formal and intensive process of carrying on the scientific method of analysis. There are many ways of obtaining knowledge. They are intuition, revelation, and authority, logical manipulation of basic assumptions, informed guesses, observation, and reasoning by analogy. One of the branches of research known as empirical research is highly goal-oriented technique.

Definitions of Research:

The following are the important definitions of research:

- "Research is an endeavor / attempt to discover, develop and verify knowledge. It is an intellectual process that has developed over hundreds of years ever changing in purpose and form and always researching to truth." J. Francis Rummel
- "Research is an honest, exhaustive, intelligent searching for facts and their meanings or implications with reference to a given problem. The product or findings of a given piece of research should be an authentic, verifiable contribution to knowledge in the field studied." P.M. Cook
- "Research may be defined as a method of studying problems whose solutions are to be derived partly or wholly from facts." W.S. Monroes
- "Research is considered to be the more formal, systematic intensive process of carrying on the scientific method of analysis. It involves a more systematic structure of investigation, usually resulting in some sort of formal record of procedures and a report of results or conclusion." John W. Best
- "Research comprises defining and redefining problems , formulating hypothesis or suggested solutions, collecting
- ,organizing and evaluating data, making deductions and reaching conclusions and at last careful testing the conclusions to determine whether they fit the formulated hypothesis." Clifford Woody
- "Research is a systematic effort to gain new knowledge." Redman & Mori

"Social research may be defined as a scientific undertaking which by means of logical and systematized techniques aims to discover new facts or verify and test old facts , analyse their sequences , interrelationships and casual explanation which were derived within an appropriate

theoretical frame of reference , develop new scientific tools , concepts and theories which would facilitate reliable and valid study of human behavior." P.V. Younge.

Purpose of Research:

The purpose of research is to discover answers to questions through the application of scientific procedure. The main aim of research is to find out the truth which is hidden and which has not been discovered as yet. Though each research study has its own specific purpose, some general objectives of research below:

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

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

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

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

Characteristics of Research:

Following are the characteristics of research;

(i)Research is directed toward the solution of a problem.

(ii)Research requires expertise.

(iii) Research emphasizes the development of generalizations, principles, or theories that will be helpful in predicting future occurrences.

(iv)Research is based upon observable experience or empirical evidences.

(v)Research demands accurate observation and description.

(vi)Research involves gathering new data from primary or first-hand sources or using existing data for a new purpose.

(vii)Research is characterized by carefully designed procedures that apply rigorous analysis.

(viii)Research involves the quest for answers to un-solved problems.

(ix)Research strives to be objective and logical, applying every possible test to validate the procedures employed the data collected and the conclusions reached.

(x)Research is characterized by patient and unhurried activity.

(xi)Research is carefully recorded and collected.

(xii)Research sometimes requires courage.

Characteristics of scientific research

- ✓ Purposiveness: The research must have a definite aim and purpose for achieving objectives.
- ✓ Rigor: The research must have a good theoretical base and sound methodology that enables collection of the right of information for data analysis.
- ✓ Testability: This means that hypothesis must be developed after a study of the problem.
- ✓ Replicability: The results of the research and hypothesis should be supported in subsequent studies conducted under similar circumstances for confidence in the research design.
- ✓ Precision and confidence: This refers to how close the findings based on a sample are to the reality. the closer the results are to the predicted phenomena, the higher the precision. Confidence refers to the probability that estimates are correct.
- ✓ Objectivity: Conclusions drawn through interpretation of results of data analysis should be objective and based on facts from actual data collected/
- ✓ Generalizability: This refers to the scope of applicability of the research findings. The wider the range of applicability of solutions by research, the more useful the research. It depends on the sampling design, instruments used for data collection and objectivity in the interpretation of data.
- ✓ Parsimony: This is the simplicity in explaining phenomena and challenges that occur in the application of solutions from research outcomes.
- ✓ Ethical-This is the most important characteristic in carrying out research.

Characteristics of good research

Good research generates reliable data and follows the standards of scientific methods, which include:

- ✓ Clear definition of purpose of the research and research problem. This should include its scope, limitations and definition of terms.
- ✓ The research process should be described in sufficient detail to permit other researchers to repeat the research.
- ✓ The research design should be carefully planned to yield objective results. The sample of a population should include evidence of the degree of representation of the sample.

- ✓ High ethical standards must be applied. A research design must include safeguards against mental or physical harm to participants, exploitation, invasion of privacy and loss of dignity.
- ✓ Limitations of the study that may arise from research design must be revealed in the research report.
- ✓ Data analysis should be sufficiently adequate for revealing the significance of the research. Data analysis should give rise to findings and conclusions.
- ✓ Findings must be presented in clear, precise assertions that are carefully drawn. Presentation of data should be comprehensive and easily understood. Findings should be presented unambiguously
- ✓ Conclusions must be justified by the data collected from the research, with detailed findings.
- ✓ The research report should contain information that gives the qualifications of the researcher for greater confidence in research reports.

TYPES OF RESEARCH:

There are varieties of ways through which we may classify it into different categories.

- **On the basis of nature of information:**

On the basis of nature of information we can classify the research into two types;

(i)Qualitative Research: When information is in the form of qualitative data.

(ii) Quantitative Research: When information is in the form of quantitative data.

- **On the basis of utility of content or nature of subject matter of research:**

On the basis of these criteria we can categorize the research into two categories.

(i)Basic/ Fundamental /pure or Theoretical Research: Its utility is universal.

(ii)Experimental or Applied Research: Its utility is limited.

- **On the basis of approach of research:** We may classify research into two different categories.

(i)Longitudinal Research: Examples of this category are historical, Case study and Genetic research.

(ii)Cross-Sectional Research: Examples of this category are Experimental and Survey Research.

- **On the basis of method of research :**

On the basis of research method we may classify a research into five different categories.

(i)Philosophical Research: It is purely qualitative in nature and we are focusing on the vision of others on the content of research.

(ii)Historical Research: It is both qualitative as well as quantitative in nature and deals with past events.

(iii)Survey Research: It deals with present events and is quantitative in nature. It may further be sub-divided into; discretional, correlational and exploratory type of research.

(iv)Experimental Research: This is purely quantitative in nature and deals with future events.

(v)Case-Study Research: It deals with unusual events. It may be qualitative as well as quantitative in nature depending upon the content.

Overview of research

Research process consists of series of actions or steps necessary to effectively carry out research. These actions or steps are;

i. Formulating the Research Problem
ii. Extensive Literature Survey
iii. Developing the Research Hypothesis
iv. Preparing the Research Design
v. Determining the Research Design
vi. Collecting the Research Data
vii. Execution of the Project
viii. Analysis of Data
ix. Hypothesis Testing
x. Generalization and Interpretation
xi. Preparing of the Report or Presentation of the Result.

- **Formulation of Research Problem:**

At the very outset, the researcher must decide the general area of interest or aspect of a subject matter that he would like to inquire into and then research problem should be formulated.

- **Extensive Literature Survey:**

Once the problem is formulated the researcher should undertake extensive literature survey connected with the problem. For this purpose, the abstracting and indexing journals and published or unpublished bibliographies are the first place to go to academic journals, conference

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

- **Development of Working Hypothesis:**

After extensive literature survey, researcher should state in clear terms the working hypothesis or hypotheses. Working hypothesis is tentative assumption made in order to draw out and test its logical or empirical consequences. It's very important or it provides the focal point for research.

- **Preparing the Research Design:**

After framing hypothesis we have to prepare a research design i.e. we have to state the conceptual structure within which research would be conducted. The preparation of such a design facilitates research to be as efficient as possible yielding maximal information. In other words, the function of research design is to provide for the collection of relevant evidence with optimum effort, time and expenditure. But how all these can be achieved depends mainly on the research purpose.

- **Determining Sample Design:**

A sample design is a definite plan determined before any data is actually collected for obtaining a sample from a given population.in census inquiry we involve a great deal of time, money and energy so it it not possible in practice under many circumstances. Sample designs can be either probability or non- probability. With probability samples each element has a known probability of being included in the sample but the non-probability samples do not allow the researchers to determine this probability.

- **Collecting the Data:**

There are several ways of collecting the appropriate data which differ considerably in context of cost, time and other resources at the disposal of the researcher. Primary data can be collected either through experiment or through survey. In case of survey, data can be collected by any one or more of the following ways; By observation, Through personal interview, Through telephonic interviews, By mailing of questionnaires or Through schedules.

- **Execution of the Project:**

Execution of project is a very important step in the research process. If the execution of the project proceeds on correct lines, the data to be collected would be adequate and dependable. A careful watch should be kept for unanticipated factors in order to keep the survey realistic as much as possible.

- **Analysis of Data:**

The analysis of data requires a number of closely related operations such as establishment of categories, the application of these categories to raw data through coding, tabulation and then drawing statistical inference. Analysis work after tabulation is generally based on the computation of various percentages; coefficients etc., by applying various well defined statistical formulae. In the process of analysis, relationships of differences supporting or conflicting with original or new hypothesis should be subjected to tests of significance to determine with what validity data can be said to indicate any conclusions.

- **Hypothesis Testing**:

After analyzing the data, the researcher is in a position to test the hypothesis, if any, he had formulated earlier. Do the facts support the hypothesis or they happen to be contrary? This is the usual question which is to be answered by applying various tests like 't' test, 'F' test etc. F test have been developed by statisticians for the purpose. Hypothesis testing will result in either accepting the hypothesis or in rejecting it. If the researcher had no hypothesis to start with, generalizations established on the basis of data may be stated.

- **Generalizations and Interpretation:**

If a hypothesis is tested and upheld several times, it may be possible for the researcher to arrive at generalization i.e. to build a theory. As a matter of fact, the real value of research lies in its ability to arrive at certain generalizations. If the researcher had no hypothesis to start with, he might seek to explain his findings on the basis of some theory. It is known as interpretation.

- **Preparation of the Report or the Thesis:**

Finally, the researcher has to prepare the report of what has been done by him. The layout of the report should be as follows; the preliminary pages, the main text and end matter. The preliminary pages carry title, acknowledgements and forward and then index. The main text of the report should have introduction, review of literature and methodology.

Criteria of Good Research:

One expects scientific research to satisfy the following criteria:

a. The purpose of the research should be clearly defined and common concepts be used.

b. The research procedure used should be described in sufficient detail to permit another researcher to repeat the researcher for further advancement, keeping the continuity of what has already been attained.

c. The procedural design of the research should be carefully planned to yield results that are as objective as possible.

d. The researcher should report with complete frankness, flaws in procedural design and estimate their effects upon the findings.

e. The analysis of data should be sufficiently adequate to reveal its significance and the methods of analysis used should be appropriate. The validity and reliability of the data should be checked carefully.

f. Conclusions should be confined to those justified by the data of the research and limited to those for which the data provide an adequate basis.

g. Greater confidence in research is warranted if the researcher is experienced, has a good reputation in research and is a person of integrity.

UNIT 2: RESEARCH PROBLEMS AND HYPOTHESES

In research process, the first and foremost step happens to be that of selecting and properly defining a research problem. A researcher must find the problem and formulate it so that it becomes susceptible to research. Like a medical doctor, a researcher must examine all the symptoms (presented to him or observed by him) concerning a problem before he can diagnose correctly. To define a problem correctly, a researcher must know: what a problem is?

What is a research problem?

A research problem, in general, refers to some difficulty which a researcher experiences in the context of either a theoretical or practical situation and wants to obtain a solution for the same. Usually, we say that a research problem does exist if the following conditions are met with: (i) There must be an individual (or a group or an organisation), let us call it 'I,' to whom the problem can be attributed. The individual or the organisation, as the case may be, occupies an environment, say 'N', which is defined by values of the uncontrolled variables, Yj . (ii) There must be at least two courses of action, say C1 and C2, to be pursued. A course of action is defined by one or more values of the controlled variables.

We can, thus, state the components1 of a research problem as under:

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

(ii) There must be some objective(s) to be attained at. If one wants nothing, one cannot have a problem.

(iii) There must be alternative means (or the courses of action) for obtaining the objective(s) one wishes to attain. This means that there must be at least two means available to a researcher for if he has no choice of means, he cannot have a problem.

(iv) There must remain some doubt in the mind of a researcher with regard to the selection of alternatives. This means that research must answer the question concerning the relative efficiency of the possible alternatives.

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

Thus, a research problem is one which requires a researcher to find out the best solution for the given problem, i.e., to find out by which course of action the objective can be attained optimally in the context of a given environment. There are several factors which may result in making the problem complicated. For instance, the environment may change affecting the efficiencies of the courses of action or the values of the outcomes; the number of alternative courses of action may

be very large; persons not involved in making the decision may be affected by it and react to it favourably or unfavourably, and similar other factors. All such elements (or at least the important ones) may be thought of in context of a research problem.

How does research begin?/research problem.

- Research usually begins with clarification of a topic in which one has some interest or about which increased knowledge is clearly needed.
- The term topic refers to subject issue or area under discussion. The topic is essential in success of research project. One's interest in topic is mandatory in order to sustain the research.
- Research problem refers to an area in any field where researcher would like to find an answer/solution.

Conditions to be met after identification of the problem.

- There must be an individual, group or organization to which the problem can be attributed(sample) eg teachers, farmers, doctors, engineer, workers, students etc
- There must be some environment in which the problem pertains (place/location i.e. Nairobi county).
- There must be some objectives to be attained.

Factors affecting the topic selection/points to observe when selecting a research problem

- Personal interest-Interest produces enthusiasm on what one is doing. It is the interest that makes the experience adequately rewarding.
- Topic one selects should be important-The topic selected should not be brought forward just because of personal interest but also because it will add to knowledge.
- Time-Due to time limitations, writers of academic research need to avoid complex topics as they may require large population samples. It is important to compare the time that topic will take against time available.
- Newness-It is always good to look at a new area so that, what one is doing is a little different from what others have done in past.
- Accessibility to material and respondents-A suitable topic is one which allows researcher to access the material. It is important to note that getting materials and respondents in some areas might not be an easy task.

Examples include

- Senior government officials.
- Vice chancellor of a university private or public.
- Health officials.
- National intelligence service.
- Ethical consideration-It is both unethical and illegal to conduct research that may slander or do physical or psychological damage to subjects involved hence a researcher needs to take care of a subject in a very humane manner.
- Subject /topic selected for research should be familiar.ie known to unknown or general to specific.
- Costs involved
- Selection of a problem must be pre-decided by a preliminary study.
- Avoid the following;
    - ✓ A subject that have been overdone
    - ✓ Too narrow/fake problem
    - ✓ Controversial subjects.

Steps in topic selection.

1. Identify areas that puzzles an interest to you-Many issues may interest or puzzle a researcher and this may be social, economic, political related issues, culture and religion.
2. Identify/select key words for the topic-Researcher should narrow down to the real aspects that are puzzling or interesting him/her and express the in specific key words. Example in human resource management, researcher may be interested on how mergers and acquisitions affect company loyalty.
3. Define the topic-Researcher analyses selected key words and tries to put them together meaningfully.
4. Formulate the topic-After problem identification and definition it is important that researcher comes up with a complete topic e.g. impact of mergers and acquisitions on company loyalty in a private sector.

Qualities of an effective research topic.

- ✓ Clear and an unambiguous.
- ✓ Supported by credible evidence.
- ✓ Should captivate or interest researcher.
- ✓ Should be researchable.

Where to get research topic from/sources of research problems.

1. Current issues(Newspaper)
2. Observation of environment behavior.
3. Personal Experience
4. Course; lecturers, discussion groups and literature.
5. Lifestyle
6. Previous research work i.e. impact of microfinances on SMEs
7. Natural calamities
8. Review of related literature-Review of published literature eg. textbooks, journals, magazines etc. Other sources in this categories include. Research bulletin, research projects, research thesis, journals of management research, dissertations and, internet.
9. Consultation with experts and research institutions.
10. Participation in professional discussions-forums, seminars, workshops, and conferences.
11. Social development –social changes and technological changes.
12. Media news like alcoholism, drug abuse, addiction, and immorality.

Selecting the Problem

The research problem undertaken for study must be carefully selected. The task is a difficult one, although it may not appear to be so. Help may be taken from a research guide in this connection. Nevertheless, every researcher must find out his own salvation for research problems cannot be borrowed. A problem must spring from the researcher's mind like a plant springing from its own seed. If our eyes need glasses, it is not the optician alone who decides about the number of the lens we require. We have to see ourselves and enable him to prescribe for us the right number by cooperating with him. Thus, a research guide can at the most only help a researcher choose a subject. However, the following points may be observed by a researcher in selecting a research problem or a subject for research:

(i)Subject which is overdone should not be normally chosen, for it will be a difficult task to throw any new light in such a case.

(ii)Controversial subject should not become the choice of an average researcher.

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

(iv) The subject selected for research should be familiar and feasible so that the related research material or sources of research are within one's reach. Even then it is quite difficult to supply definitive ideas concerning how a researcher should obtain ideas for his research. For this purpose, a researcher should contact an expert or a professor in the University who is already engaged in research. He may as well read articles published in current literature available on the subject and may think how the techniques and ideas discussed therein might be applied to the solution of other problems. He may discuss with others what he has in mind concerning a problem. In this way he should make all possible efforts in selecting a problem.

(v) The importance of the subject, the qualifications and the training of a researcher, the costs involved, the time factor are few other criteria that must also be considered in selecting a problem. In other words, before the final selection of a problem is done, a researcher must ask himself the following questions:

(a) Whether he is well equipped in terms of his background to carry out the research?

(b) Whether the study falls within the budget he can afford?

(c) Whether the necessary cooperation can be obtained from those who must participate in research as subjects? If the answers to all these questions are in the affirmative, one may become sure so far as the practicability of the study is concerned.

(vi) The selection of a problem must be preceded by a preliminary study. This may not be necessary when the problem requires the conduct of a research closely similar to one that has already been done. But when the field of inquiry is relatively new and does not have available a set of well-developed techniques, a brief feasibility study must always be undertaken. If the subject for research is selected properly by observing the above mentioned points, the research will not be a boring drudgery, rather it will be love's labour. In fact, zest for work is a must. The subject or the problem selected must involve the researcher and must have an upper most place in his mind so that he may undertake all pains needed for the study.

Necessity of defining the problem

Quite often we all hear that a problem clearly stated is a problem half solved. This statement signifies the need for defining a research problem. The problem to be investigated must be defined unambiguously for that will help to discriminate relevant data from the irrelevant ones. A proper definition of research problem will enable the researcher to be on the track whereas an ill-defined problem may create hurdles. Questions like: What data are to be collected? What characteristics of data are relevant and need to be studied? What relations are to be explored. What techniques are to be used for the purpose? and similar other questions crop up in the mind of the researcher

who can well plan his strategy and find answers to all such questions only when the research problem has been well defined. Thus, defining a research problem properly is a prerequisite for any study and is a step of the highest importance. In fact, formulation of a problem is often more essential than its solution. It is only on careful detailing the research problem that we can work out the research design and can smoothly carry on all the consequential steps involved while doing research.

Technique involved in defining a problem

Let us start with the question: What does one mean when he/she wants to define a research problem? The answer may be that one wants to state the problem along with the bounds within which it is to be studied. In other words, defining a problem involves the task of laying down boundaries within which a researcher shall study the problem with a pre-determined objective in view. How to define a research problem is undoubtedly a herculean task. However, it is a task that must be tackled intelligently to avoid the perplexity encountered in a research operation. The usual approach is that the researcher should himself pose a question (or in case someone else wants the researcher to carry on research, the concerned individual, organisation or an authority should pose the question to the researcher) and set-up techniques and procedures for throwing light on the question concerned for formulating or defining the research problem. But such an approach generally does not produce definitive results because the question phrased in such a fashion is usually in broad general terms and as such may not be in a form suitable for testing.

Defining a research problem properly and clearly is a crucial part of a research study and must in no case be accomplished hurriedly. However, in practice this a frequently overlooked which causes a lot of problems later on. Hence, the research problem should be defined in a systematic manner, giving due weightage to all relating points.

The technique for the purpose involves the undertaking of the following steps generally one after the other:

(i) statement of the problem in a general way;

(ii) understanding the nature of the problem;

(iii) surveying the available literature

(iv) developing the ideas through discussions; and

(v) rephrasing the research problem into a working proposition.

A brief description of all these points will be helpful.

(i) Statement of the problem in a general way: First of all the problem should be stated in a broad general way, keeping in view either some practical concern or some scientific or intellectual interest. For this purpose, the researcher must immerse himself thoroughly in the subject matter concerning which he wishes to pose a problem. In case of social research, it is considered advisable

to do some field observation and as such the researcher may undertake some sort of preliminary survey or what is often called pilot survey. Then the researcher can himself state the problem or he can seek the guidance of the guide or the subject expert in accomplishing this task. Often, the guide puts forth the problem in general terms, and it is then up to the researcher to narrow it down and phrase the problem in operational terms. In case there is some directive from an organisational authority, the problem then can be stated accordingly.

The problem stated in a broad general way may contain various ambiguities which must be resolved by cool thinking and rethinking over the problem. At the same time the feasibility of a particular solution has to be considered and the same should be kept in view while stating the problem.

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

(iii) Surveying the available literature: All available literature concerning the problem at hand must necessarily be surveyed and examined before a definition of the research problem is given. This means that the researcher must be well-conversant with relevant theories in the field, reports and records as also all other relevant literature. He must devote sufficient time in reviewing of research already undertaken on related problems. This is done to find out what data and other materials, if any, are available for operational purposes. "Knowing what data are available often serves to narrow the problem itself as well as the technique that might be used."2 . This would also help a researcher to know if there are certain gaps in the theories, or whether the existing theories applicable to the problem under study are inconsistent with each other, or whether the findings of the different studies do not follow a pattern consistent with the theoretical expectations and so on. All this will enable a researcher to take new strides in the field for furtherance of knowledge i.e., he can move up starting from the existing premise. Studies on related problems are useful for indicating the type of difficulties that may be encountered in the present study as also the possible analytical shortcomings. At times such studies may also suggest useful and even new lines of approach to the present problem.

(iv) Developing the ideas through discussions: Discussion concerning a problem often produces useful information. Various new ideas can be developed through such an exercise. Hence, a researcher must discuss his problem with his colleagues and others who have enough experience in the same area or in working on similar problems. This is quite often known as an experience

survey. People with rich experience are in a position to enlighten the researcher on different aspects of his proposed study and their advice and comments are usually invaluable to the researcher. They help him sharpen his focus of attention on specific aspects within the field. Discussions with such persons should not only be confined to the formulation of the specific problem at hand, but should also be concerned with the general approach to the given problem, techniques that might be used, possible solutions, etc. (v) Rephrasing the research problem: Finally, the researcher must sit to rephrase the research problem into a working proposition. Once the nature of the problem has been clearly understood, the environment (within which the problem has got to be studied) has been defined, discussions over the problem have taken place and the available literature has been surveyed and examined, rephrasing the problem into analytical or operational terms is not a difficult task. Through rephrasing, the researcher puts the research problem in as specific terms as possible so that it may become operationally viable and may help in the development of working hypotheses.

In addition to what has been stated above, the following points must also be observed while defining a research problem:

(a)Technical terms and words or phrases, with special meanings used in the statement of the problem, should be clearly defined.

(b) Basic assumptions or postulates (if any) relating to the research problem should be clearly stated.

(c) A straightforward statement of the value of the investigation (i.e., the criteria for the selection of the problem) should be provided.

(d) The suitability of the time-period and the sources of data available must also be considered by the researcher in defining the problem.

(e) The scope of the investigation or the limits within which the problem is to be studied must be mentioned explicitly in defining a research problem.

AN ILLUSTRATION

The technique of defining a problem outlined above can be illustrated for better understanding by taking an example as under: Let us suppose that a research problem in a broad general way is as follows: "Why is productivity in Japan so much higher than in India"? In this form the question has a number of ambiguities such as: What sort of productivity is being referred to? With what industries the same is related? With what period of time the productivity is being talked about? In view of all such ambiguities the given statement or the question is much too general to be amenable to analysis. Rethinking and discussions about the problem may result in narrowing down the question to: "What factors were responsible for the higher labour productivity of Japan's manufacturing industries during the decade 1971 to 1980 relative to India's manufacturing industries?" This latter version of the problem is definitely an improvement over its earlier version for the various ambiguities have been removed to the extent possible. Further rethinking and rephrasing might place the problem on a still better operational basis as shown below: "To what extent did labour productivity in 1971 to 1980 in Japan exceed that of India in respect of 15 selected

manufacturing industries? What factors were responsible for the productivity differentials between the two countries by industries?" With this sort of formulation, the various terms involved such as 'labour productivity', 'productivity differentials', etc. must be explained clearly. The researcher must also see that the necessary data are available. In case the data for one or more industries selected are not available for the concerning time-period, then the said industry or industries will have to be substituted by other industry or industries. The suitability of the time-period must also be examined. Thus, all relevant factors must be considered by a researcher before finally defining a research problem.

UNIT 3: RESEARCH DESIGN AND DATA COLLECTION

Introduction

With the completion of the initial phase of the research process, the researcher turns to designing a research design to formally identify the appropriate sources of data. This is done in order that any researcher who embarks on a research project should have a blueprint of how he is going to undertake scientifically the data collection process. The framework developed to control the collection of data is called research design.

Research design is an absolute essentiality in research irrespective of the type of research (e.g., exploratory or descriptive), as it ensures that the data collected is appropriate, economical and accurate. This also ensures that the research project conducted is effectively and efficiently done. A sufficiently formulated research design would ensure that the information gathered is consistent with the study objectives and that the data are collected by accurate procedures. Since, research designs germinate from the objectives, the accuracy and adequacy of a research design depends on the unambiguous framing of the objectives.

Types of research design

Two types of research design are established according to the nature of the research objectives or types of research. They are:

- Exploratory design; and Conclusive design. (Descriptive research and casual research)

Exploratory Research Design

It is appropriate when the research objective is to provide insights into (i) identifying the problems or opportunities (ii) defining the problem more precisely, (iii) gaining deeper insights into the variables operating in a situation (iv) identifying relevant courses of action

(i)establishing priorities regarding the potential significance of a problems or opportunities

(ii)gaining additional insights before an approach can be developed and (vii) gathering information on the problems associated with doing conclusive research. Much research has been of an exploratory nature; emphasising on finding practices or policies that needed changing and on developing possible alternatives.

On examination of the objectives of exploratory research, it is well understood that it could be used at the initial stages of the decision making process. It allows the marketer to gain a greater understanding of something that the researcher doesn‟t know enough about. This helps the decision maker and the researcher in situations when they have inadequate knowledge of the

problem situation and/or alternative courses of action. In short, exploratory research is used in the absence of tried models and definite concepts.

Exploratory research could also be used in conjunction with other research. As mentioned below, since it is used as a first step in the research process, defining the problem, other designs will be used later as steps to solve the problem. For instance, it could be used in situations when a firm finds the going gets tough in terms of sales volume, the researcher may develop use exploratory research to develop probable explanations. Analysis of data generated using exploratory research is essentially abstraction and generalization. Abstraction refers to translation of the empirical observations, measurements etc. into concepts; generalization means arranging the material so that it focuses on those structures that are common to all or most of the cases.

The exploratory research design is best characterised by its flexibility and versatility. This is so, because of the absence of the non-imperativeness of a structure in its design. It predominantly involves imagination, creativity, and ingenuity of the researcher. Examples of exploratory research are: survey of experts to validate an instrument; pilot studies conducted to perform reliability check on a questionnaire; use of secondary data in order to analyse it in a qualitative way; qualitative research.

Conclusive Research Design

It involves providing information on evaluation of alternative courses of action and selecting one from among a number available to the researcher. As portrayed in the figure 4.1, conclusive research is again classified as:

(i)Descriptive research

(ii)Causal research.

(i)**Descriptive Research**: It is simple to understand as the name itself suggests that it involves describing something, for example:

(a)market conditions;

(b)characteristics or functions;

(c)estimate the percentage of customers in a particular group exhibiting the same purchase behaviour;

(d)perceptions of product characteristics; and

(e)to predict the pattern of behaviour of characteristic versus the other

The majority of research studies are descriptive studies. As research studies involve investigating the customers/consumers, collection of data includes interrogating the respondents in the market and data available from secondary data sources. However, it cannot be concluded that descriptive studies should be simply fact-gathering process. Descriptive study deals with the respondents in

the market and hence, extreme caution has to be exercised in developing this study. Much planning should be done, objectives should be clear than exploratory studies.

In descriptive research, the data is collected for a specific and definite purpose and involves analysis and interpretation by the researcher. The major difference between exploratory and descriptive research is that descriptive research is characterised by the formulation of specific objectives. The success of descriptive studies depends on the degree to which a specific hypothesis acts as a guide.

Descriptive studies restrict flexibility and versatility as compared to exploratory research. It involves a higher degree of formal design specifying the methods for selecting the sources of information and for collecting data from those sources. Formal design is required in order to ensure that the description covers all phases desired.

It is also required to restrain collection of unnecessary data. Descriptive studies require a clear specification of the who, when, where, what, why and how.

While designing a descriptive research, the researcher should also have sufficient knowledge on the nature and type of statistical techniques he/she is going to use. This will greatly help to have the right design in place. Mostly descriptive studies are conducted using questionnaire, structured interviews and observations. The results of description studies are directly used for marketing decisions.

Descriptive studies are again classified into two types:

(a)Longitudinal (b)Cross sectional

- Longitudinal research relies on panel data and panel methods. It involves fixing a panel consisting of fixed

sample of subjects that are measured repeatedly. The panel members are those who have agreed to provide information at specific intervals over an extended period. For example, data obtained from panels formed to provide information on market shares are based on an extended period of time, but also allow the researcher to examine changes in market share over time. New members may be included in the panel when there is a dropout of the existing members or to maintain representativeness.

Panel data is analytical and possess advantages with respect to the information collected in the study. They are also considered to be more accurate than cross sectional data because panel data better handle the problem associated with the errors that arise in reporting past behaviour and the errors that arise because of the necessary interaction between interviewer and respondent.

- Cross-sectional research is the most predominantly and frequently used descriptive research design in marketing. It involves a sample of elements from the population of interest. The sample elements are measured on a number of characteristics. There are two types of cross-sectional studies:

(c)Field studies and Surveys

It may appear that field studies and surveys are no different but the same. However, for practical reasons, they are classified into two categories cross-sectional research. The fundamental difference lies in the depth of what these research cover. While survey has a larger scope, field study has greater depth. Survey attempts to be representative of some known universe and filed study is less concerned with the generation of large representative samples and is more concerned with the in-depth study of a few typical situations.

The cross-sectional design may be either single or multiple cross-sectional design depending on the number of samples drawn from a population. In single cross-sectional design, only one sample respondents is drawn whereas in multiple cross-sectional designs, there are two or more samples of respondents. A type of multiple cross-sectional design of special interest is Cohort analysis.

Cohort analysis consists of a series of surveys conducted at appropriate time intervals, where the cohort serves as the basic unit of analysis. A cohort is a group of respondents who experience the same event within the same time interval.

(a) Case Study: This study involves intensive study of a relatively small number of cases. In this method, much emphasis is on obtaining a complete description and understanding of factors in each case, regardless of the number involved. It could be used significantly, particularly when one is seeking help on a problem in which interrelationships of number of factors are involved, and in which it is difficult to understand the individual factors without considering them in their relationships with each other. As in the case of exploratory research, case method is also used in conjunction with exploratory research as first step in a research process. It is of

prime value when the researcher is seeking help on a market problem in which the interrelationships of a number of factors are involved, and in which it is difficult to understand the individual factors without considering them in their relationships with each other.

(ii)Causal research: It is used to obtain evidence of cause-and-effect relationships with is otherwise known as the independent-dependent relationship or the predictive relationships. This is an important type of research useful for marketers as this allows marketers to base their decision on assumed causal relationships. Causal research is done in the following situations:

(a)To identify which variables are the cause and which are the effect. In statistical terms, causal variables are called independent variables and effectual variables are called dependent variables.

(b)To determine the nature of the relationship between the causal variables and the effect to be predicted.

Causal research requires a strong degree of planning on the design as its success depends on the structure of the design.

DATA COLLECTION

Introduction

The next step in the research process after identifying the type of research the researcher intends to do is the deciding on the selection of the data collection techniques. The data collection technique is different for different types of research design. There are predominantly two types of data: (i) primary data and (ii) the secondary data.

- Primary data is one a researcher collects for a specific purpose of investigating the research problem at hand. Secondary data are ones that have not been collected for the immediate study at hand but for purposes other than the problem at hand. Both types of data offer specific advantages and disadvantages.

- Secondary data offer cost and time economies to the researcher as they already exist in various forms in the company or in the market. It is feasible for a firm to collect. Since they are collected for some other purposes, it may sometimes not fit perfectly into the problem defined. The objectives, nature and methods used to collect the secondary data may not be appropriate to the present situation.

Mostly secondary data helps to:

- ✓ Identify the problem. Better define the problem.
- ✓ Develop an approach to the problem.
- ✓ Formulate an appropriate research design by identifying the key variables. Answer certain research questions and formulate hypotheses.
- ✓ Interpret the primary data more in-depth.

Secondary data

Secondary data are the data that are in actual existence in accessible records, having been already collected and treated statistically by the persons maintaining the records. In other words, secondary data are the data that have been already collected, presented tabulated, treated with necessary statistical techniques and conclusions have been drawn. Therefore, collecting secondary data doesn't mean doing some original enumeration but it merely means obtaining data that have already been collected by some agencies, reliable persons, government departments, research workers, dependable organisations etc. Secondary data are easily obtainable from reliable records, books, government publications and journals.

When once primary data have been originally collected, moulded by statisticians or statistical machinery, then it becomes secondary in the hands of all other persons who may be desirous of handling it for their own purpose or studies. It follows, therefore, that primary and secondary data

are demarcated separately and that the distinction between them is of degree only. It a person 'X' collects some data originally, then the data is primary data to 'X' whereas the same data when used by another person 'Y' becomes secondary data to 'Y'.

Sources of secondary data

The following are some of the sources of secondary data:

1. Central and State government publications.
2. Publications brought out by international organisation like the UNO, UNESCO, etc.
3. Foreign government publications.
4. Official publications as well as reports of municipalities, district parishads, etc.
5. Reports and publications of commissions - like U.G.C. education commission, tariff commission, chambers of commerce, co-operative societies, trade associations, banks, stock exchanges, business houses etc.
6. Well-know newspapers and journals like the Economic Times, The Financial Express, Indian Journal of Economics, Commerce, Capital, Economical Eastern Economist, etc. Further Year Books such as Times of India Year Book, Statesman's Year Book also provide valuable data.
7. Publications brought out by research institutions, universities as well as those published by research workers give considerable secondary data.
8. Through the Internet/website sources.
9. Though the given list of secondary data cannot be said to be thorough or complete, yet it can be pointed out that it fairly indicates the chief sources of secondary data. Also, besides the above mentioned data there are a number of other important sources, such as records of governments in various departments, unpublished manuscripts of eminent scholars, research workers, statisticians, economists, private organisations, labour bureaus and records of business firms.

Types of secondary data

Secondary data are of two types. Data that are originated from within the company are called as internal data. If they are collected for some other purpose, they are internal secondary data. This poses a significant advantage as they are readily available in the company at low cost. The most convenient example of internal secondary data is the figures relating to sales of the company. Important internal source of secondary data is database marketing, Database marketing involves the use of computers to capture and track customer profiles and purchase details. The information about customer profile would serve as the foundation for marketing programmes or as an internal source of information related to the preference of customer’s preference for a particular product.

Published external secondary data refers to the data available without the company. There is such a pool of published data available in the market that it is sometimes easy to underestimate what is available and thereby bypass relevant information. Several sources of external data are available. They are:

- ✓ **General Educational Data**
    - Guides or small booklets containing information about a particular school or institution.
    - Directories are helpful for identifying individuals or organisations that collect specific data. Indexes used to locate information on a particular topic in several different publications by using an index.
    - Non-governmental statistical data refers to published statistical data of great interest to researchers. Graphic and statistical analyses can be performed on these data to draw meaning inference.
    - Government Sources

Census data is a report published by the Government containing information about the population of the country. Other Government publications may be pertaining to availability of train tickets just before it leaves.

- ✓ **Computerised Databases**
    - Online databases are databases consisting of data pertaining to a particular sector (e.g., banks) that is accessed with a computer through a telecommunication network
    - Internet databases are available in internet portals that can be accessed, searched, and analysed on the internet.
    - Offline databases are databases available in the form of diskettes and CD-ROM disks.
    - Bibliographic databases comprises of citations in articles published in journals, magazines, newspapers etc. Numeric databases contain numerical and statistical information. For example, time series data about stock markets. Directory databases provide information on individuals, organisations and service. E.g. Getit Yellow pages.
    - Special-purpose databases are databases developed online for a special purpose.
- ✓ **External Data-syndicated**
    - In response to the growing need for data pertaining to markets, consumer etc., companies have started collecting and selling standardised data designed to serve the information needs of the shared by a number of organisations.

Syndicated data sources can be further classified as (a) consumer data (b) retail data (c) wholesale data (d) industrial data (e) advertising evaluation data and (f) media and audience data.

- Consumer data relates to data about consumers purchases and the circumstances surrounding the purchase.
- Retail data rely on retailing establishments for their data. The data collected focus on the products or services sold through the outlets and / or the characteristics of the outlets themselves.
- Wholesale data refers to data on warehouse shipment data to estimate sales at retail.
- Industrial data refers to substantially more syndicated data services available to consumer goods manufacturers than to industrial goods suppliers.

Verification of secondary data

Before accepting secondary data it is always necessary to scrutinize it properly in regard to its accuracy and reliability. It may perhaps happen that the authorities collecting a particular type of data may unknowingly carry out investigations using procedures wrongly. Hence it is always necessary to carry out the verification of the secondary data in the following manner:

(i)Whether the organization that has collected the data is reliable.

(ii)Whether the appropriate statistical methods were used by the primary data enumerators and investigators.

(iii)Whether the data was collected at the proper time.

Collection of Primary data

By primary data we mean the data that have been collected originally for the first time. In other words, primary data may be the outcome of an original statistical enquiry, measurement of facts or a count that is undertaken for the first time. For instance data of population census is primary. Primary data being fresh from the fields of investigation is very often referred to as raw data. In the collection of primary data, a good deal of time, money and energy are required.

QUESTIONNAIRE

A questionnaire is defined as a formalised schedule for collecting data from respondents. It may be called as a schedule, interview form or measuring instrument.

Measurement error is a serious problem in questionnaire construction. The broad objective of a questionnaire includes one without measurement errors. Specifically, the objectives of a questionnaire are as follows:

a)It must translate the information needed into a set of specific questions that the respondents can and will answer.

b) The questions should measure what they are supposed to measure.

It must stimulate the respondents to participate in the data collection process. The respondents should be adequately motivated by the virtual construct of the questionnaire.

c)It should not carry ambiguous statements that confuse the respondents.

Questionnaire Components

A questionnaire consists typically of five sections. They are:

- **a.** Identification data
- **b.** Request for cooperation
- **c.** Instruction
- **d.** Information sought
- **e.** Classification of data

    a) Identification data occupation is the first section of a questionnaire where the researcher intends to collect data pertaining to the respondent's name, address, and phone number.

    b) Request for cooperation refers to gaining the respondents' cooperation regarding the data collection process.

    c) Instruction refers to the comments of the respondent regarding how to use the questionnaire.

    d) The information sought from the major portion of the questionnaire. This refers to the items relating to the actual area of the study.

    e) Classification data are concerned with the characteristics of the respondent.

OBSERVATION METHODS

This is another type of method used when the researcher feels that survey type of methods may not be so relevant in data collection. In subjective issues, respondents need to be observed rather than asked lest biases and prejudices happen in their response. Observation method may be either structured or unstructured. Structured observation method involves having a set of items to be observed and how the measurements are to be recorded. In unstructured observation, the observer monitors all aspects of the phenomena that seem relevant to the problem at hand. In this context, the observer may have an open mind to study the persons or object.

UNIT 4: THE MEASUREMENT PROCESS

Measurement is defined as the assignment of numbers to characteristics of objects or events according to rules. The definition of measurement clearly states that the researcher should know that the measurement scale measures the characteristics of the objects or event and not the objects or events.

Further, to make the measurement process effective, the relationships existing among the objects or events in the empirical system should directly correspond to the rules of the number system. If this correspondence is misrepresented, measurement error has occurred. The term number indicates the application of numbers to various aspects measured in the measurement process. Data analysis is a statistical process done on the data generated using scales. Hence, all measures should be converted into quantitative terms by applying numbers. However, the definition of measurement imposes certain restrictions on the type of numerical manipulations admissible.

The numerical application on all measurements and the analysis of numbers using mathematical or statistics involve one or more of the four characteristics of number system. Measurement of any property could be fitted into any of these characteristics.

Levels of Measurement

Researchers normally use four level of measurement scales. They are:

a) Nominal scale

b) Ordinal scale

c) Interval scale

d) Ratio scale

Nominal Scale

Nominal scale are categorical scales used to identify, label or categorise objects or persons or events. A familiar example is the use of alternative numbering system by our Physical Education Teacher in our school days to engage us in a game. The teacher as a result would form two groups one labelled 1 and the other 2. The numbers 1 and 2 are assigned to two groups and the members belonging to group 1 would exclusively be a part of group 1 and the members belonging to group 2 would exclusively be a part of group 2. However, assigning the numbers does not indicate any order or position to the group it represents. Interchanging the numbers otherwise would also result in the same effect in that, the order or position would not change.

Nominal scales are the lowest form of measurement. The simple rule to be followed while developing a nominal scale: Do not assign the same numerals to different objects or events or

different numbers to the same object or event. In marketing nominal scales are used substantially in many occasions. For example, nominal scale is used to identify and classify brands, sales regions, awareness of brands, working status of women etc., On data generated using nominal scale, the type of statistical analysis appropriate are mode, percentages, and the chi-square test. Mode alone could be used as a measure of central tendency. Mean and median could be employed on nominal data since they involve higher level properties of the number system. Researchers should be careful enough to identify the type of scales before they apply any statistical technique. The researcher may not be able to make any meaning inference from the mean or median value obtained from nominal data.

Ordinal Scale

Ordinal scale is a ranking scale that indicates ordered relationship among the objects or events. It involves assigning numbers to objects to indicate the relative extent to which the objects possess some characteristic. It measure whether an object or event has the same characteristic than some other object or event. It is an improvement over nominal scale in that it indicates an order. However, this scale does not indicate on how much more or less of the characteristic various objects or events possess. The term how much refers to ranks that it do not indicate if the second rank is a close second or a poor second to the first rank.

Data generated using ordinal scale appears as ranks where the object which has ranked first has more of the characteristic as compared to those objects ranked second or third. Hence, the important feature of ordinal scale over nominal scale is that it indicates relative position, not the magnitude of the difference between the objects. In research, ordinal scales are used to measure relative attitudes, opinions, perceptions etc., Most data collected by the process of interrogating people have ordinal properties. To illustrate, a marketer may be interested in knowing the preference of the customers across various brands. The customers may be requested to rank the products in terms of their preference for the products.

The numbers assigned to a particular object or event can never be changed in ordinal scales. Any violation of this principle would result in confounding results by the researcher. Mean is not an appropriate statistic for ordinal scale.

Interval Scale

Interval scale is otherwise called as rating scale. It involves the use of numbers to rate objects or events. It interval scales, numerically equal distances on the scale represent equal values in the characteristic being measured. Interval scale is an advancement over the ordinal scale that it has all the properties of an ordinal scale plus it allows the researcher to compare the differences between objects. It also possesses the property of equality of difference between each levels of measurement. The feature of this scale is that the difference between any two scale values is identical to the difference between any other two adjacent values of an interval scale. Examples of interval scales are the Fahrenheit and Celsius scales.

Interval scales also place restriction on the assignment of values to the scale points. The zero that could be assignment is a arbitrary zero rather than a natural zero. Arbitration involves freedom to place the zero value on any point. There is a constant or equal interval between scale values.

In research, most of the research on attitudes, opinions and perceptions are done using scales treated as interval scales. All statistical techniques that are employed on nominal and ordinal scales could also be employed on data generated using interval scales.

Ratio Scales

Ratio scales differ from interval scales in that it has a natural/absolute zero. It possesses all the properties of the normal, ordinal and interval scales. Data generated using ratio scales may be identified, classified into categories, ranked and compared with others properties. It could also be expressed in terms of relativity in that one can be expressed in terms of a division of the other. Hence, it may be called as relative scales.

Ratio scales have great many number of application in research. They include sales, market share, costs, ages, and number of customers. In all these cases, natural zero exists. All statistical techniques can be applied on ratio data.

Sampling design

Research does not exist without sampling. Every research study requires the selection of some kind of sample. It is the life blood of research.

Any research study aims to obtain information about the characteristics or parameters of a population. A population is the aggregate of all the elements that share some common set of characteristics and that comprise the universe for the purpose of the research problem. In other words, population is defined as the totality of all cases that conform to some designated specifications. The specification helps the researcher to define the elements that ought to be included and to be excluded. Sometimes, groups that are of, interest to the researcher may be significantly smaller allowing the researcher to collect data from all the elements of population. Collection of data from the entire population is referred to as census study. A census involves a complete enumeration of the elements of a population.

Collecting data from the aggregate of all the elements (population) in case of, the number of elements being larger, would sometimes render the researcher incur huge costs and time. It may sometimes be a remote possibility. An alternative way would be to collect information from a portion of the population, by taking a sample of elements from the population and the on the basis of information collected from the sample elements, the characteristics of the population is inferred. Hence, Sampling is the process of selecting units (e.g., people, organizations) from a population of interest so that by studying the sample we may fairly generalize our results back to the population from which they were chosen.

While deciding on the sampling, the researcher should clearly define the target population without allowing any kind of ambiguity and inconsistency on the boundary of the aggregate set of respondents. To do so, the researcher may have to use his wisdom, logic and judgment to define the boundary of the population keeping with the objectives of the study.

Types of sampling plans

Sampling techniques are classified into two broad categories of probability samples or non-probability samples.

Probability Sampling Techniques

Probability samples are characterised by the fact that, the sampling units are selected by chance. In such case, each member of the population has a known, non-zero probability of being selected. However, it may not be true that all sample would have the same probability of selection, but it is possible to say the probability of selecting any particular sample of a given size. It is possible that one can calculate the probability that any given population element would be included in the sample. This requires a precise definition of the target population as well as the sampling frame.

Probability sampling techniques differ in terms of sampling efficiency which is a concept that refers to trade off between sampling cost and precision. Precision refers to the level of uncertainty about the characteristics being measured. Precision is inversely related to sampling errors but directly related to cost. The greater the precision, the greater the cost and there should be a tradeoff between sampling cost and precision. The researcher is required to design the most efficient sampling design in order to increase the efficiency of the sampling.

Probability sampling techniques are broadly classified as simple random sampling, systematic sampling, and stratified sampling.

Simple Random Sampling

This is the most important and widely used probability sampling technique. They gain much significance because of their characteristic of being used to frame the concepts and arguments in statistics. Another important feature is that it allows each element in the population to have a known and equal probability of selection. This means that every element is selected independently of every other element. This method resembles lottery method where a in a system names are placed in a box, the box is shuffled, and the names of the winners are then drawn out in an unbiased manner.

Simple random sampling has a definite process, though not, so rigid. It involves compilation of a sampling frame in which each element is assigned a unique identification number. Random numbers are generated either using random number table or a computer to determine which elements to include in the sample. For example, a researcher is interested in investigating the behavioural pattern of customers while making a decision on purchasing a computer. Accordingly,

the researcher is interested in taking 5 samples from a sampling frame containing 100 elements. The required sample may be chosen using simple random sampling technique by arranging the 100 elements in an order and starting with row 1 and column 1 of random table, and going down the column until 5 numbers between 1 and 100 are selected. Numbers outside this range are ignored. Random number tables are found in every statistics book. It consists of a randomly generated series of digits from 0 – 9. To enhance the readability of the numbers, a space between every 4th digit and between every 10th row is given. The researcher may begin reading from anywhere in the random number table, however, once started the researcher should continue to read across the row or down a column. The most important feature of simple random sampling is that it facilitates representation of the population by the sample ensuring that the statistical conclusions are valid.

Systematic Sampling

This is also another widely used type of sampling technique. This is used because of its ease and convenience. As in the case of simple random sampling, it is conducted choosing a random starting point and then picking every element in succession from the sampling frame. The sample interval, i, is determined by dividing the population size N by the sample size n and rounding to the nearest integer.

Consider a situation where the researcher intends to choose 10 elements from a population of 100. In order to choose these 10 elements, number the elements from one to 100. Within 20 population elements and a sample of size 10, the number is 10/100 = 1/10, meaning that one element in 10 will be selected. The sample interval will, therefore, be 10. This means that after a random start from any point in the random table, the researcher has to choose every 10th element. Systematic sampling is almost similar to simple random sampling in that each population element has a known and equal probability of selection. However, the difference lies in that simple random sampling allows only the permissible samples of size n drawn have a known and equal probability of selection. The remaining samples of size n have a zero probability of being selected.

Stratified Sampling

Stratified sampling is a two-way process. It is distinguished from simple random sampling and systematic sampling, in that:

a) It requires the division of the parent population into mutually exclusive and exhaustive subsets

b) A simple random sample of elements is chosen independently from each group or subset. Therefore, it characterises that, every population element should be assigned to one and only stratum and no population elements should be omitted. Next, elements are selected from each stratum by simple random sampling technique. Stratified sampling differs from quota sampling in that the sample elements are selected probabilistically rather than based on convenience or on judgemental basis.

Strata are created by a divider called the stratification variable. This variable divides the population into strata based on homogeneity, heterogeneity, relatedness, or cost. Sometimes, more than one variable is used for stratification purposes. This type of sampling is done in order to get homogenous elements within each strata and, the elements between each strata should have a higher degree of heterogeneity. The number of strata to be formed for the research is left to the discretion of the researcher, though, researchers agree that the optimum number of strata may be 6.

The reasons for using stratified sampling are as follows:

a) it ensures representation of all important sub-populations in the sample;

b) the cost per observation in the survey may be reduced;

c)it combines the use of simple random sampling with potential gains in precision;

d)estimates of the population parameters may be wanted for each sub-population and;

e) increased accuracy at given cost.

Non-probability Sampling Methods

Non-probability sampling does not involve random selection. It involves personal the judgement of the researcher rather than chance to select sample elements. Sometimes this judgement is imposed by the researcher, while in other cases the selection of population elements to be includes is left to the individual field workers. The decision maker may also contribute to including a particular individual in the sampling frame. Evidently, non-probability sampling does not include elements selected probabilistically and hence, leaves a degree of sampling error‟ associated with the sample.

Sampling error is the degree to which a sample might differ from the population. Therefore, while inferring to the population, results could not be reported plus or minus the sampling error. In non-probability sampling, the degree to which the sample differs from the population remains unknown However, we cannot come to a conclusion that sampling error is an inherent of non probability sample.

Non-probability samples also yield good estimates of the population characteristics. Since, inclusion of the elements in the sample are not determined in a probabilistic way, the estimates obtained are not statistically projectable to the population. The most commonly used non-probability sampling methods are convenience sampling, judgment sampling, quota sampling, and snowball sampling.

Convenience Sampling

Convenience samples are sometimes called accidental samples because the elements included in the sample enter by „accident". It is a sampling technique where samples are obtained from convenient elements. This refers to happening of the element at the right place at the right time, that is, where and when the information for the study is being collected. The selection of the respondents is left to the discretion of the interviewer. The popular examples of convenience sampling include (a) respondents who gather in a church (b) students in a class room (c) mall intercept interviews without qualifying the respondents for the study (d) tear-out questionnaire included in magazines and (e) people on the street. In the above examples, the people may not be qualified respondents, however, form part of the sample by virtue of assembling in the place where the researcher is conveniently placed.

Convenience sampling is the least expensive and least time consuming of all sampling techniques. The disadvantage with convenience sampling is that the researcher would have no way of knowing if the sample chosen is representative of the target population.

Judgement Sampling

This is a form of convenience sampling otherwise called as purposive sampling because the sample elements are chosen since it is expected that they can serve the research purpose. The sample elements are chosen based on the judgement that prevails in the researcher's mind about the prospective individual. The researcher may use his wisdom to conclude that a particular individual may be a representative of the population in which one is interested.

The distinguishing feature of judgment sampling is that the population elements are purposively selected. Again, the selection is not based on that they are representative, but rather because they can offer the contributions sought. In judgement sampling, the researcher may be well aware of the characteristics of the prospective respondents, in order that, he includes the individual in the sample. It may be possible that the researcher has ideas and insights about the respondent's requisite experience and knowledge to offer some perspective on the research question.

Quota Sampling

Quota sampling is another non-probability sampling. It attempts to ensure that the sample chosen by the researcher is a representative by selecting elements in such a way that the proportion of the sample elements possessing a certain characteristic is approximately the same as the proportion of the elements with the characteristic in the population.

Quota sampling is viewed as two-staged restricted judgemental sampling technique. The first stage consists of developing control categories, or quotas, of population elements. Control characteristics involve age, sex, and race identified on the basis of judgement. Then the distribution of these characteristics in the target population is determined. For example, the researcher may use control categories in that, he/she intends to study 40% of men and 60% of women in a population. Sex is the control group and the percentages fixed are the quotas.

In the second stage, sample elements are selected based on convenience or judgement. Once the quotas have been determined, there is considerable freedom to select the elements to be included in the sample. For example, the researcher may not choose more than 40% of men and 60% of women in the study. Even if the researcher comes across qualified men after reaching the 40% mark, he/she would still restrict entry of men into the sample and keep searching for women till the quota is fulfilled.

Snowball Sampling

This is another popular non-probability technique widely used, especially in academic research. In this technique, an initial group of respondents is selected, usually at random. After being interviewed, these respondents are asked to identify others who belong to the target population of interest. Subsequent respondents are selected based on the information provided by the selected group members. The group members may provide information based on their understanding about the qualification of the other prospective respondents. This method involves probability and non-probability methods. The initial respondents are chosen by a random method and the subsequent respondents are chosen by non-probability methods.

DATA ANALYSIS AND INTERPRETATION

A researcher's important function is the appropriate interpretation of different types of statistical data with the help of his tools. The preliminary statistical work consists of collection, classification, tabulation, presentation and analysis of data. The most important part of the statistical work consists in the proper use of the statistical tools in the interpretation of data.

The most commonly used tools are 'Mean, Median, Mode; Geometric Mean, Measures of Dispersion such as Range; Mean Deviation, Standard Deviation and also other measures such as Coefficient of Correlation, Index Numbers etc. It is necessary to note that technical interpretation of data has to be combined with a high degree of sound judgement, statistical experience, skill and accuracy. After all figures do not lie, they are innocent. But figures obtained haphazardly, compiled unscientifically and analyzed incompetently would lead to general distrust in statistics by the citizens. It should be understood that "statistical methods are the most dangerous tools in the hands of an expert".

DATA EDITING AND CODING

Authenticity and relevance of a research investigation is based on the assurance of error-free qualitative reliability of the collected data. Data processing has to be carried out in an appropriate manner. Processing comprises the task of editing, coding classification and tabulation. In spite of a careful collection by a researcher, there may be a possibility for errors of omission and commission arising and it is for this purpose that the process of editing becomes necessary.

The editor, while examining certain responses of the respondents, may find some mistakes in the form of incomplete, vague or irrelevant answers. Such inconsistent answers have to be eliminated or suitably and reasonably modified. Further, there should be no room for fictitious data to creep in. Hence the editor has to take care to see that the authenticity of the data is in a perfect shape.

For the purpose of classification of the data into meaningful and useful classes, the procedure of coding has to be used. This procedure would be advantageous in dealing with the data having a number of characteristics. Also, a large volume of data can be processed accurately.

Manual processing and analysis can be carried out by using measures of central tendency, dispersion, correlation regression and other statistical methods if the volume of data is not very large.

In case a researcher is confronted with a very large volume of data then it is imperative to use 'computer processing'. For this purpose necessary statistical packages such as SPSS etc. may be used. Computer technology can prove to be a boon because a huge volume of complex data can be processed speedily with greater accuracy.

UNIT 5: REPORT DESIGN AND WRITING IN RESEARCH

Introduction

Much has been dealt in detail in the previous lesson about the processes involved in research. The researcher may be glued into the technicalities in doing a research, however, the research effort goes in vain, if it is reported in a systematic manner to concerned decision makers. The report should be presented in a way what the decision maker needs and wishes to know. The decision maker is interested only in the results rather than complicated tables and he/she should be convinced of the usefulness of the findings. He / she must have sufficient appreciation of the method to realize its strengths and weaknesses. Research report is the only one which communicates with the decision maker.

Research reports are the only tangible products of a research project and only

documentary evidence on which the decision maker can make decisions. Management decisions on the problem concerned are guided by the report and presentation. Moreover, the report should be meticulously presented as this would form part of a secondary data at a later stage. Any reference to this report should convey information in an unambiguous manner with clarity.

CRITERIA FOR REPORT WRITING

The research report should be made as per the requirement of the decision maker meaning that it should purely and simply tailor made for the decision maker with due regard for their technical sophistication, interest in the subject area, circumstances under which they will read the report, and use they will make of it. The report should be made keeping in mind the technical sophistication of the decision maker. A decision maker with little technical sophistication may sometimes distort the inference that could be made from the result. Sometimes use of sophisticated technical jargons may result in the decision maker looking at the researcher with suspicion that he / she has used his high flair knowledge to prove his supremacy in the area of research.

The researcher may be confronted with a situation where the report he or she makes is meant for several others in the organization. In such a case, preparing a report that would satisfy everyone in the organization would be a tough task. In this regard, the researcher should have an understanding of the technical capacity and level of interest in the report by everyone concerned.

It may be appropriate if the researcher discusses the major findings, conclusions and recommendations with the decision makers before sitting down to prepare. Discussions before submission may prevent major discord among the targets to whom the research report is concerned. This would also result in the researcher knowing the needs of the concerned decision makers and ensures that the report meets the client‟s needs and finally the report is ultimately accepted. The discussion on the results should confirm specific dates for the delivery of the written report and other data.

REPORT FORMAT

Research formats may vary from researcher to researcher as well depending on the need of the decision maker. However, any researcher could not violate the fundamental contents a report should have. They should include the following:

i. Title page includes the title of the report, name, address and telephone number of the researcher or organization conducting the research, the name of the client for whom the report was prepared and the date of release.

ii. Letter of transmittal refers to a summary of the researcher's overall experience with the research, without mentioning the findings.

iii. Letter of authorization contains the authorization given by the decision maker to the researcher to do the project.

iv. Table of contents include the list of topics covered and appropriate page number.

v. Executive summary is important in a research report as this presents the report in a shortened form. Sometimes, the decision maker would read only this portion of the report when constrained by time. This should describe the problem, approach, and research design that was adopted. A small portion of the summary section should be devoted to the major results, conclusions and recommendations.

vi. Problem definition shows the background to the problem, highlights the discussion with the decision makers and industry experts and discusses the secondary data analysis, the qualitative research that was conducted, and the factors that were considered.

vii. Approach to the problem discusses the broad approach that was adopted in addressing the problem. This should contain a description of the theoretical foundations that guided the research, any analytical models formulated, research questions, hypothesis and the factors that influenced the research design.

viii. Research design shows the details of the nature of the research design adopted, information needed, data collection from secondary and primary sources, scaling techniques, questionnaire development and pretesting, sampling techniques, and field work.

ix. Data analysis describes the plan of the data analysis conducted on the data. It justifies the choice of the technique for a particular objective and hypothesis.

x. Results comprise of the results presented not only at the aggregate level but also at the subgroup level. The results, as mentioned earlier, should be presented in the most simpler way, enabling the decision maker to understand in the right sense.

xi. Limitations and Caveats contain the limitations caused by the research design, cost, time and other organizational constraints. However, a research should not contain many limitations. The researcher should have controlled many of the limitations during the research process.

xii. Conclusions and recommendations involve interpretation of the results in light of the problem being addressed to arrive at major conclusions. The decision maker makes decision based on the conclusion and recommendations of the researcher.

GUIDELINES FOR TABLES

Data analysed should be presented in the research report in a tabular form. The guidelines for tables are as follows:

i. Title and number should be given for every table such as 1a. The title should be very brief just explaining the description of the information provided in the table.

ii. Arrangement of data items indicate that the data should be arranged in some order either pertaining to time or data etc.

iii. Leaders, ruling and spaces should be made in such a way that they lead the eye horizontally, impart uniformity, and improve readability.

iv. Explanations and comments: explanations and comments clarifying the table may be provided in the form of captions, stubs and footnotes. Designations placed on the vertical columns are headings; those placed in the left-hand are called stubs. Information that cannot be incorporated in the table should be explained by footnotes.

v. Sources of the data refer to citing the source of secondary data used in the research.

GUIDELINES FOR GRAPHS

The researcher may have used graphical interpretation of the results. Use of graphs complements the text and the table adding clarity of communication and impact. The researcher may use any type of graphssuch as pie or round charts, line charts, pictographs, histograms and bar charts. While presenting the graphs, the researcher should ensure that each section or line or bar of the charts should be represented in different colours or shades.

WAYS IN WHICH INFORMATION TECHNOLOGY CAN IMPROVE RESEARCH.

- **Globalization**

Information technology has not only brought the world closer together but it has allowed the world's economy to become a single interdependent system. This means that a researcher cannot only share information quickly and efficiently but can also bring down barriers of linguistic and geographic boundaries (Kothari, 2010). Of great importance is the issue that the world has developed into a global village due to the help of information technology allowing researchers not only separated by distance but also by language to share information with each other in the language one understands.

- **Innovation**

There has been growing interest in research networks and its implications on the creation of new knowledge. The rapidly increased use of the web, internet, intranets, extranets, e-business, e-commerce and mobile computing changes the manner in which research is done and even application in business transactions. Of special importance is the emergence of the second generation e-commerce applications such as m-commerce, c-commerce, e-learning and e-government where research can be carried out effectively. It enables researchers to stimulate, visualize, model and experiment with complex, real-world problems, promoting exploratory and inquiry- based models of researching. Further in research, information technology enables and fosters development of critical thinking skills, visualization, conceptualization, integration of disparate data and resolution of patterns within data.

- **Online interviewing and focus groups**

The internet is used to communicate with research subjects and in addition to quantitative surveys, online approaches to qualitative research have been tried. Online interviewing and focus groups can be an effective means to collect qualitative data. Careful planning and attention to rapport building is useful to elicit the kind of accounts that researchers hope for. People can take part from home and this be able to fit in the interview even though they would travel to a face to face meeting. They may feel more comfortable discussing sensitive subjects online such as fertility problems. According to Slavin (2007), where people are comfortable with the idea of communicating online, it can be possible to use email to collect rich qualitative data. People being interviewed feel that the online interaction puts them more in charge than they would be face-to-face, allowing them to think carefully and reflect on their answers and also respond only when they feel able to cope with the interaction. Data collected online can therefore be useful to researchers and can sometimes provide insights that face to face methods do not.

- **Fieldwork on online settings**

There is a large quantity of naturally occurring data on the internet that allows a researcher to observe what people do under less controlled circumstances. The internet is a filed site for ethnographic research in which the researcher uses some familiar techniques from more conventional ethnography to explore the culture in the online setting. Ethnography research involves a combination of techniques. When carried out online, it includes observation through reading messages or being present in interactions together with online interviews. Sometimes face to face interviews may be carried out particularly when participants themselves have face to face meetings in the normal course of events (www.researchnavigator.com)

- **Publications**

To publish is to bring specific information to the public domain through written documents or by posting such information in a website. Publications refer to published documents including books, periodicals, scholarly journals, magazines among others. Publishing also includes the distribution

of copies of the written work to the general public with the consent of the author. The document may be distributed free on sold. Researchers are encouraged to publish their findings in journals books or other forms of publication. This facilitates wider sharing of research findings among researchers, professionals and policy makers. Publishing research findings and regularly reading journals papers published by other researchers improve ones research skills. Published articles thoroughly describe the research methodology that the author has followed in conducting the study. Experience has shown that prolific writers of research materials also tend to be exemplary researchers. What such people share with the research community helps to shape the way research is conducted by setting certain standards. Subjecting journal papers to referees, ensures that high standards are maintained in research

- **Bridging the cultural gap**

Information technology has helped to bridge the cultural gap by helping people from different cultures to communicate with one another and allow for the exchange of views and ideas thus creating awareness and reducing prejudice. Further, a researcher is facilitated by information technology in connections across disciplinary, institutional, geographical, and cultural boundaries (Slavin 2007).

- **Saving time**

Internet is open for twenty-four hours daily all over the globe. This means that research can be undertaken all the time in a twenty four hour basis. This is unlike the library or research sample which has restricted time. This includes printing the literature one may find fit for benchmarking or aiding his research study. Information technology to researchers aids and illustrates the workings of complex methods by exploring cause-effect relationships and hypothetical scenarios. It aids research by encouraging collaboration with other individuals, teams or institutions while exposing researchers to different ideas and perspectives within a limited time frame.

- **Calculations/ tabulation of data**

Computers perform calculations almost at the end speed of light. They are ideally suited for data analysis concerning large research projects. Researchers are essentially concerned with huge storage of data, their faster retrieval when required and processing of data with the aid of various techniques (Baikie, 2003). Researchers in economics and other social sciences have found electronic computers to constitute an indispensable part of their research equipment. Computers can perform many statistical calculations easily and quickly. Software packages are readily available for the various simple and complicated analytical and quantitative and complicated analytical and qualitative techniques of which researchers generally make use of. To the researcher, the use of computer to analyze complex, data has made complicated research designs practical. Electronic computers have by now become an indispensable part of research students in the physical and behavioral sciences as well as in the humanities. The research student, in this age

of computer technology, must be exposed to the methods and use of computers. A basic understanding of the manner in which a computer works helps a person to appreciate the utility of this powerful tool. Researchers using computers can carry on the task at faster speed and with great reliability. The developments now taking place in computer technology will further enhance and facilitate the use of computers for researchers. Programming knowledge would no longer remain an obstacle in the use of a computer (Kothari, 2010)

WAYS IN WHICH INFORMATION TECHNOLOGY HAS BEEN MISUSED IN RESEARCH

- **Plagiarism**

Plagiarism is the unauthorized use of close imitation of the language and thoughts of another and representation of them as their one's original work or simply copying of another's written work. This is the biggest challenge in research work. It is no secret that plagiarism is the biggest trouble that a writer can get into. A thousand of free information provided by the internet has allowed dishonest writers who steal other peoples work and present it as their own. Most research scholars have misused Information Technology by just copying what others have already researched on and posted their results in the website, this contributes to lack of originality because the work is only but a duplication of other's work. Some times because the work in the website may have been produced a long time ago, the information at the time of duplication is not up to date especially when the information relies on data or numerical values because time has passed since the data that is in the website was produced hence the duplicated work is not a true reflection of the current time (data is not up to date)

- **Over reliance to information may lead to getting irrelevant information**

Technology has rocked the research with quite a chunk of literature. This information may be very relevant to one title or topic but equally the literature may be quite large that for one to go through and sieve this requirement is quite a task, this is further made worse by the fact that one in the process may carry out unnecessary information which does not add up properly and this contributes to irrelevant information being gathered. More so today the tools used in research are so complicated that if not correctly and rightly controlled will give out wrong perception including researcher's conclusion and recommendation which may be disastrous if implemented. This implies that some of these techniques of research like sampling and gathering information must be practically done and results analyzed rather than using the Information Technology to generate them.

- **Lack of originality**

Since the introduction of Information Technology on research, it has come to notice that most of the researchers especially the scholars do not produce their own original work from the field since they may be undertaking a similar project that is already posted in websites. Since the work could be accessible to anybody this could lead to duplicating work that has already been done without even getting data from the actual field but simply doing exactly what others have already done, this contributes to lack of originality and creativity and this may make the whole research lose its meaning because no much personal effort has been made but only relying on others efforts.

- **Lack of privacy or confidentiality (impact on confidentiality)**

Confidentiality is one of the ethical issues in research work. A research project should guarantee confidentiality when the researcher can identify a given person's responses but essentially promises not to do so in publicly. In an interview survey for example the researcher could make public the income reported by a given respondent, but the respondent is assured this will not be done. When a research project is confidential, it is like researchers responsibility to make that fact clear to the respondent. This is not always an easy task to follow. Once the researcher does not keep this confidentiality and the information spreads to the public either through the media or the website, it spreads to a large number of populations and this creates much harm to the feelings of the respondent, because information that is in the internet can be accessed to everyone hence compromising privacy or confidentiality. J. Steven (1996a, 1996b) points out that a certificate of confidentiality to protect confidentiality of research subject data against disclosure can act as an important protection through both filed reports and data in the websites.

- **Hacking of research information**

Researchers may use computer to steal research data and information stored from other computers through hacking. Computer hacking is the practice of modifying computer hardware and software to accomplish a goal outside of the original purpose. People who engage in computer hacking are called hackers. This involves manipulating other person's security details (password) and accessing his/her information in the computer software without his/her consent. This is a crime, in some cases, computer hackers or thieves often take advantage of one's effort to access their information has already been exposed to the public with or without her knowledge. It is true that internet has made research work easier but it is also reflecting an uglier side to its existence through a number of problems to its users. Internet theft and misuse of information has been a great challenge. Cases of people using someone's information and research and using it as if it were their own have been reported through this practice of hacking. Since at times protection in the computer software may not be effective to keep off hackers, researchers find it difficult to do their work and at times are forced to do it manually.

- **Production of poor results**

Hokanson and Hooper (2000) report that technology use in Education research has generated poor results .He argues out that technology has been used only to automate existing educational processes and thus has short changed its potential. The computer technology be realized leading to improved Educational quality and productivity. In cases where one relies on only what others have already done is a topic related to what one may under take leads to production of results that are not a true reflection.

- **Encouragement of cheating through impersonification through the websites**

Impersonification in the act of using another person's identity and details to perform a certain task for him/her. Today people do not do their own work anymore. More and more students and researchers rely on the web to do their work for them. This can range from copy and pasting to paying a website to write a paper for them. This encourages cheating in one's paper in research because the work has been done by another person.

- **Use of dominance culture that may be irrelevant to our situation**

While information technology may have made the world a global village, it has also contributed to one culture dominating another. In all aspects of life including scholarly work, business among others, for example it is now argued that the US researchers influence others all over the world on how to perform their research and if one does not conform with their standards no matter how relevant the results are, it may be nullified. Languages too have become overshadowed with English becoming the primary mode of communication for research everywhere, bearing in mind that not all countries or nations speak or communicate in English.

- **Loosing of data through over reliance**

Since most researchers store their information in computer storage devices which includes flash disks, CDS and tapes, without proper backup the information may be lost. It is no longer important to file one's work in written records because they type their work in computers, store the data in the computers, when these devices get destroyed the information is lost. This issue is brought about by over reliance on technology.

REFERENCING

Academic conventions and copyright law require that you acknowledge when you use the ideas of others. In most cases, this means stating which book or journal article is the source of an idea or quotation. Referencing is a standardized method of formatting the information sources used in assignments or written work and serves the purpose of acknowledging the source and allowing the reader to trace the source. The American Psychological Association (APA) Referencing guide.

The APA style consists of rules and conventions for formatting term papers, journal articles, books e.t.c in the behavioral and social sciences.

Reference lists and bibliography

A reference list is a list of all the sources that have been used as in-text references in the research report. A bibliography is a wider list of reading that includes both in-text references and other sources which may have informed thinking on the topic, but may not have been placed as an in-text reference in the research writing. One of the main reasons why referencing is important is to avoid plagiarism. Plagiarism is taking, using and submitting the thoughts, writings etc. of another person as one's own.

APA CITATION SPECIFICATIONS – IN TEXT

- One Author: If a book has just one author, the author's last name followed by the publication date is usually provided. For example: Freud (1900) found out……Or …as Jones (2001) described…
- Direct Quotation: If a direct quotation is used, the APA citing should always include the page number where the source can be found.
- No Author: Some sources lack information on authorship. In-text citations should use a short article title enclosed in parentheses and the date. When article titles are long, simply use the first word or two of the title.
- For example: The study revealed a strong positive correlation between the two variables ("Learn APA," 2006).

Referencing materials without dates : According to the official APA style website, the correct way to do this is to include the notation "n.d." for no date. For example, you would cite an article from a website as follows:

- Cherry, K. (n.d.). How to become a psychologist. About.com. Retrieved from http://psychology.about.com/od/careersinpsychology/ss/become-a-psychologist.htm
- Two Authors: When a source lists two authors, in-text citations should provide the last names of both authors and the publication date. For example: …later studies demonstrated a similar effect (Ross & Hudson, 2004). Or Ross and Hudson (2004) found a similar effect in later studies.
- Three to Seven Authors: Proper APA format for sources with three to seven authors requires listing the last names of all authors the first time they are cited as well as the publication date.For example: …results indicated a strong positive correlation between the two variables (Robsen, Hutchkins, Ru, & Selanis, 1989)., Or Robsen, Hutchkins, Ru, & Selanis (1989) found a strong positive correlation between the two variables.

- Subsequent citations should list only the last name of the first author along with the publication date. For example: Robsen (1989) demonstrated the affects of…Or …in a study demonstrating these effects (Robsen, et al., 1989).

- Seven or More Authors: To cite sources with more than seven authors a listing of the last name of the first author as well as the publication date should suffice. For example: …students demonstrated competence after reading about APA format (Smith et al., 2005). Or Smith et al., (2005) found that…

Organizations as Authors: The full name of the organization is always included the first time the source is cited in-text. The citation should also include the acronym of the organization if one is available. Subsequent citations can simply list the acronym and the publication date.For example: The American Psychological Association (2000) reported that… Or …found that students responded positively (American Psychological Association [APA], 2000). and subsequent citations (APA, 2000).

APA Citing for Electronic Sources

- The exact format used for APA citing of electronic media depends upon the type of source that is used. In many cases, the format will be very similar to that of books or journal articles, but one should also include the URL of the source and the date it was accessed in the reference section.

Online Documents: The basic structure for referencing online documents is very similar to other references, but with the addition of a retrieval date and source. Date of accessing the document online should be given and the exact URL where the document can be found.

- For example: Cherry, K. (2006). Guide to APA format. About Psychology. Retrieved from http://psychology.about.com/od/apastyle/guide

Online Journal Article: Online journal articles should be cited much like print articles, but they should include additional information about the source location. The basic structure is as follows:

- Author, A. B., Author, C. D., & Author, E. F. (2000). Title of article. Title of Periodical, Volume number, page numbers. Retrieved from source

- For example: Jenet, B. L. (2006) A meta-analysis on online social behavior. Journal of Internet Psychology, 4. Retrieved from http://www. journalofinternetpsychology.com/archives/volume4/ 3924.html

Article Retrieved from a Database: Articles that are retrieved from online databases are formatted like a print reference. For example: Henriques, J. B., & Davidson, R. J. (1991) Left frontal hypoactivation in depression. *Journal of Abnormal Psychology*, 100, 535-545.

Online Newspaper Article: When citing an online newspaper article, you should provide the URL of the newspaper's home page. For example: Parker-Pope, T. (2011, November 16). Practicing on patients. The New York Times. Retrieved from http://www.nytimes.com

Electronic Version of a Print Book: One should only include electronic book references if the book is only available online or is very difficult to find in print. The reference will be very similar to a regular print book reference, except the electronic retrieval information takes the place of the publisher location and name.

- For example: Freud, S. (1922). Totem und Tabu: Einige Übereinstimmungen im Seelenleben der Wilden und der Neurotiker [Kindle version]. Retrieved from http://www.gutenberg.org/ebooks/37065.kindle.images

Online Forums, Discussion Lists, or Newsgroups: Messages posted by users on forums, discussion lists, and newsgroups should follow the basic structure for citing an online document. When possible, the posters real name starting with the last name is used and followed by a first initial. If this is not possible, the author's online screen name is used. The exact date that the message was posted should also be included.

- For example: Leptkin, J. L. (2006, November 16). Study tips for psychology students [Online forum comment]. Retrieved from http://groups.psychelp.com/forums/messages/48382.html
- (Visited 10,171 times, 1 visits today)
- **REFER to current APA format**