

**YMCA COLLEGE OF PHYSICAL EDUCATION , NANDANAM  
CHENNAI- 6000 35**

**MASTER OF PHYSICAL EDUCATION**



**M.P.Ed- II YEAR**

**MCC-101 RESEARCH PROCESS IN PHYSICAL EDUCATION AND SPORTS SCIENCES**

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## **UNIT I – Introduction**

Meaning and Definition of Research – Need, Nature and Scope of research in Physical Education. Classification of Research, Location of Research Problem, Criteria for selection of a problem, Qualities of a good researcher.

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### **SCOPE OF RESEARCH IN PHYSICAL EDUCATION**

Scope is the extent of the area or subject matter that something deals with or to which it is relevant. It is room or opportunity for free outlook or aim; space for action; amplitude of opportunity; free course or vent; liberty; range of view, intent, or action.

1. Physical education as an academic discipline
2. Physical education and professional preparation
3. Physical education and other sciences
4. Research committee and councils
5. Human Efficiency and performance
6. Research laboratory and Doctoral studies
7. Role of Physical education, natural and social sciences
8. Research Publications
9. Consultant and reconditioning causalities
10. Dimensions on conferences and seminars
11. Research assistance and fellowship

#### 1. Physical education as an academic discipline :

Previously physical education was treated as an extra curricular activity. Now the scope of physical education is treated on par with the other disciplines as botany, chemistry, physics, chemistry etc.. The prime aspect behind it is research development on physical education and sports. Now physical education range of view is widened to an examination subject as B.Sc Physical education, M.Sc physical education, B.P.Ed., M.P.Ed., M.Phil., Ph.d., programmes. These programmes enrich the field of physical education to an academic discipline and as a faculty.

#### 2. Physical education and professional preparation:

Previously , there was no full pledge physical education courses available. Day after day the extra curricular activity ( phy.edn) was converted into full pledged subject course as compared with other sciences. Now the experts in physical education and sports so called sports scientists are trying to develop our curriculum in such a way so that we are getting B.P.Ed., M.P.Ed., M.P.Es., B.P.Es., B.Sc physical education. These are all latest trends and developments in the field of teaching and coaching through research. In addition Physical

education and sports are preparing the individuals as professionalists every year, the products are coming out with success to withstand the profession to the larger extent.

3. Physical Education and other sciences:

Most important areas are still unexplored. Upcoming sports sciences like exercises physiology , sports psychology, sports sociology , sports medicine etc., which contribute substantially to make physical education a unique subject ; have yet to answer certain vital question concerning human behaviour in the context of athletic settings. Secrets of elite performance are being revealed every day yet generalization has not been possible. Much is known , much more remains to be unknown.

4. Research committee and councils:

Since 1961, a number of research committees have been set up and physical education scientists like Dr. Edward Hitch cock, Dr. Dudley A. Sargent, Dr. Williams G. Anderson and Dr. James H. Mc. Crudy were the members and they have conducted many researchers in the field of physical education and sports. A research council with 150 physical education researchers are supporting the research Quarterly since 1942. They have published research papers, articles and brief studies through research quarterly. They are also publishing the international scientific monograph series in physical education.

5. Human Efficiency and performance :

The role of physical educational research has wider connotations than any other fields like industry and agriculture. In sports human is involved as a whole in its utility. A physiologist is concerned with the efficient functioning of the different systems of the body. A psychologists with the internal and external aspects of mental processes as they relate to behaviour. Whereas physical educationist needs to study the whole man. This makes research in physical and sports more amenable to strict controls and elaborate procedures.

6. Research laboratory and Doctoral studies:

Now physical education and sports are well established and comprehensive research laboratories have been set up throughout the world. Well prepared and experienced professors with national and international reputations are working in this field as scientist. At present , colleges and universities have their own separate research laboratories which are attached to the department.

7. Role of Physical education, natural and social sciences:

Human behavior is influenced by social and natural sciences. Research strategies in physical education nd sports derive their strength to cope with problems of diversified nature such as health, fitness, performances, recreation, learning, teaching, management, curricula formation, ethical standards, values etc.

8. Research Publications:

Previously there was no reference books , reviews related literature in our field to find out evidence for present studies. We have now research quarterly readily available.. The physical education scientist have published articles in many journals other than particular field like sports medicine, rehabilitation , physiology, psychology, sports psychology, sports journalism, sports commentary, child's growth and development.

9. Consultant and reconditioning causalities:

Physically educated persons have worked as consultant in factories and industries. They were also engaged by the armed forces , medical services in the physical reconditioning. They also serve as corrective therapist. Physical educators have been associated with psychiatric and hospitals to treat patients.

10. Dimensions on conferences and seminars:

Throughout the world there are number of conferences, seminars, workshops, clinics and symposium to develop the profession and quest for the further research. Physical educators from India have also started participants in national and international conferences on physical fitness, yoga, sports psychology , sports physiology, sports biomechanics, sports sociology and research seminars.

11. Research assistance and fellowship:

Physical education researchers are also getting funds, assistance and fellowships on par with other disciplines. It shows the awareness and need to every citizen that physical education research is a must in the universe. At present JRF (Junior Research Fellowship) SRF (Senior Research Fellowship) are common to physical education and sports. A number of physical education scientists receives grants and aid to do projects and research works from India and abroad

## **CLASSIFICATION OF RESEARCH**

Educational research may be classified under three categories: (1) Basic research (2) Applied research (3) Action research

(1) Basic research:

It is also called as “ pure research” aiming at the discovery of basic truth or principles. It emphasis control and precision and gives less attention to direct application of the results in field situation. It seeks to increase man's understanding of his own environment. Physical activity is a biological necessity and participation in physical activities would improve and maintain physical fitness among individuals – is the principle or generalization which has come out of basic research.

Basic research seeks to obtain information about some inknown factors. It seeks to broden the base of knowledge common to all skills or technique , rather than being specific to one skill or technique. Q213r2vr±Fundamental research can take shape in two different

ways. (i) it may be an entirely new discovery , knowledge of which has not existed so far ( researcher's own idea or imagination) (ii) It may be the development of existing theory by interpreting by developing a new theory with the existing one as the basis .

Example: Techniques in long jump or high jump are generalized truth which cannot be changed

### (2) Applied research:

Applied research called as “ field research” is concerned primarily with establishing relationships and testing theories in the field and applying to other samples of the population from which the research subjects are taken. Example: The bio chemist may discover a medicine for a particular disease as a result of fundamental research. The medical practioners of the hospitals may try out this medicine on several patients under difficult conditions and find out the type of patients whom it affects positively and conditions under which it works well. Hence the doctor is conducting a research which may be called as applied research.

In schools when teaching a skill or technique in any sport or games the coach may face several problems to make the students to understand and perform the skill effectively , He needs to conduct research to solve the problem that affect his instructional process and the ability of the students to learn the skill.

### (3) Action Research:

Incase of action research the person faces problem and tries to find out its solution by searching in a scientific way, to guide, correct and evaluate through different lines of action.( i) he thinks about the nature of the problem (2) ways and means to solve it . Action research is is very necessary for every teacher to improve his class room practices. A teacher has not to wait for months to see the results of his approach, where the results may bee seen immediatly while teaching a lesson or after a brief period of time. Action research is a continuous process which includes the trying out of an approach like recording the results , changing the approach if the desired results are not achieved, adopting a new approach and so on.

Example : When teaching a flop technique in High Jump some students will be able to perform and few students may not be able to perform . The teacher then immediately changes his method of teaching, show some videos, demonstrate the technique more times and teach them to do the technique. Here the teacher is finding different methods of teaching to improve the learning process of the students. Thus a teacher finds out a solution to solve a problem is called as action research.

## **LOCATING OF RESEARCH PROBLEM**

A Research problem is a question that a researcher wants to answer or a problem that a researcher wants to solve. A research problem is an issues or a concern that an investigator / researcher presents and justifies in a research study.

## **LOCATION OF RESEARCH PROBLEM**

The common sources of research problem are as follows.

1. Systematically record unsolved problems
2. Analyze literature in an area or subject field
3. Study research already completed
4. Consult with the members of the faculty
5. Read all the reports and journals to get problems
6. Identification of research problem  
Identification of the research problem is the first step. . Generally a broad area is selected and then it is delimited or narrowed down to a specific one sentence statement of the problem.
7. Personal experience : Day to day experience of the researcher serves as a good source of ideas to formulate research problem.
8. Practical experience : Field experience provides physical education teachers ample opportunities for problem identification. This serves as a source for identifying research problems.
9. Critical appraisal of literature : When one looks at books, articles, summaries of clinical issues relating to the subject of our interest, pertinent questions may arise. These may strike the reader's mind by stimulating imagination and directly the additional research needed.
10. Previous research : A body of knowledge is developed on a sound research finding. . Usually at the end of the research problems are suggested based on the shortcoming of the previous research, these could be investigated.
11. Existing Theories : Research is a process of theory development and theory testing. If an existing theory is used in developing a researchable problem, a specific statement from theory must be isolated. Generally a part or parts of a theory are subjected to testing in a clinical situation. The testing of a theory is needed therefore they serve as a good source of research problem.
12. Social Issues : Sometimes issues of global contemporary or political issues of relevance are suggested. .A idea for a research may stem from a familiarity with social concerns or controversial social issues.
13. Brainstorming . Brainstorming sessions are good techniques to find new research questions. Brainstorming refers to intensified discussions among interested people of the profession in order to find more ideas to formulate a good research problem.

14. Intuition : Intuitions' are considered good sources of knowledge as well as sources to find new research problems. It is believed that reflective mind is a good source of ideas, which may be used to find out new and good research problems.
15. Folklores : Common beliefs could be right or wrong. E.g., Studying just before examination decrease the score. A researcher can conduct a study to test this.
16. Exposure to Field Situations : During field exposure researchers get a variety of experiences which may provide plenty of ideas to formulate research problems.
17. Consultations with Experts : Experts are believed to have sound experience of their respective field, which may suggest a significant problem to be studied. In addition experts may help in finding a current problem of discipline to be solved which may serve as a basis for formulation of research problem.

### **CRITERIA FOR SELECTION OF A RESEARCH PROBLEM**

Selection of a research problem depends on several factors such as researcher's knowledge, skills, interest, expertise, motivation & creativity with respect to the subject chosen. A good research studies needs a lots of time for selection of research problem.

A number of factors should be considered in deciding whether or not to proceed with a particular study. The following are to be answered

#### **1. Is the problem interest to you ?**

One should have the interest in the topic he has choosen. For example some may not be interested in animal studies especially if dissection is required. Some other individuals may find the library study required for historical research too boring . Repetitions of testing required for an experimental study may not be interested to some persons and too much of statistical analysis may be distasteful to others. Anyhow , if one cannot find suitable problem , even though it is not much interested in a problem , he becomes enthusiastic about his work once he is involved in it.

#### **2. Is it possible to obtain data appropriate to the problem ?**

A study on vital capacity requires a wet spirometer and on “ blood pressure “ requires Sphygmomanometer . If these are not available for the study taken , the study must be abandoned. If instruments required for the programme are not available in the institution it should be borrowed from the other institution or the reseacvher can take the subjects to that institution and conduct testing.

### **3. Is the research feasible ?**

The feasibility is connected with the problem of cost and time. Consideration should be given to the length of time to complete the study.

### **4. Does the researcher have adequate training and experience to interpret the results ?**

In experimental studies , laboratory skills are required for collecting the data . Certain skills require extensive training whereas others need only relatively little experience.

Ex: For recording the blood pressure , one should have the knowledge of using the sphygmomanometer for which he can be trained adequately by a medical officer. Adequate training is required in the subject of research and statistics for the interpretation of results.

### **5. Will the problem makes a significant contribution ?**

The research problem should contribute to the field of knowledge or to the profession. For example the effect of bull worker exercises improve he shotput performance , then the shot putters will try on doing exercises with bull workers . In the same way , the same study taken by a graduate student, may be taken up by a doctoral student with greater depth.

### **Personal Criteria**

1)Interest 2). Aptitude 3) Knowledge 4) Financial status 5) Competence and training  
6.)Intellectual Caliber 7.) Experience

### **Social Criteria**

1. Availability of subjects 2.) 2. Subjects 'willingness to cooperate in research 3. Consultancy with experts 4. Value of the society 5. Stimulate future research 6. Originality and uniqueness  
7. No personal Bias.

### **Research Criteria**

It lay down certain standards both technical and procedural such as

1) Involvement of principles 2.) Availability of data 3) Availability of precise instruments  
4)Techniques of measurements 5 ) Techniques of interpretation 6 ) Newness of the problem



## Qualities of a Good Researcher

### **1. An analytical mind**

“As a researcher he has to constantly analyze a variety of factors.

- Why does the researcher ultimately want to do this research?
- What is the appropriate methodology?
- When should this research take place?
- What are the appropriate questions to ask and how?
- Why did the respondent say that?
- What are the findings telling us?
- Why are they telling us that?
- How do I best communicate the findings? etc.

On a daily basis researchers must be able to take a step back and analyse the situation presented to them. The obvious answer is not necessarily the right one” . “Researcher should be able to see the bigger picture as well as the detail. People often find it easier to do one or the other- it is a skilled researcher that can do both simultaneously” A researcher would be different from other people of the society. On the basis of this quality he may observe the situation very well. Then he should be able to solve the problems easily.

### **2. A people person**

“This is important for respondents of research would rather work with professional and friendly consultants. Also for respondents – to get the best out of interview / focus group participants” . A good researcher must have the quality to become friendly with respondents. It should have to talk to them in the same language in which the responding are answering and make happy made.

### **3. Least Discouragement & the ability to stay calm**

“It can be really stressful as a researcher sometimes, especially when he has pressing deadlines or are experiencing problems with a data set, for example. When these situations occur, he should just have to keep focused and think logically – there will always be an end point, even if it does not feel like it!” If the people are not co-operate to give correct data, the researcher should not be discouraged and face the difficulties, it would be called a good researcher.

### **4. Intelligence ,Curiosity , Quick thinker & Commitment**

“Research requires critical analysis but most of all common sense” “Researcher may have the necessary intelligence but if he is are curious enough then he will not be passionate about delving deeper to unearth more insight” . To be a researcher he has to have an inherent interest in what other people think (potentially about absolutely anything!), and should have the the greater depth of information he can be extracted.

## **5. Excellent written and verbal communication skills**

“So different audiences can clearly understand the findings of the research and what it means for them” “Researcher have to have excellent written communications and be fluent in the language” The conversation of a good researcher should be sympathetic and not boring. He must have the skill and art to be liked by the people.

## **6. Sympathetic & Systematic**

“Having a sympathetic ear when listening to some respondents’ moans and groans is always a good skill to have!” . “Check, check and check again. This can be applied to all parts of the research process” “Attention to detail – the ability to ensure that data is accurately presented and reported is very much required for a researcher.

## **7. Free From Prejudice, Truthful & Equality and Justice.**

A researcher would be good if he has no prejudice or bias study about a problematic situation but he is capable of providing clear information’s. A researcher must have to be truthful. Its idea would be free from false reports and saying information. A good researcher should believe on equality and justice. As equal to all type of people he may collect better information’s from the respondents.

## **8. Capacity of Depth Information& Accuracy.**

A researcher should have the capacity to collect more and more information in little time. A researcher would be said to be good, if he is accurate in his views. His ideas must be accurate one.

## **9. Keen Observer & Careful in Listening**

It is the quality of a good researcher that he may have the ideas of keen and deep observation. A researcher would be more careful in listening. He would have the quality of listening very low information’s even whispering

## **10. Least time Consumer & Economical.**

Good researcher must have the capacity of least time consuming. It will have to do more work in a little time because of the shortage of time. Good researcher must have control over his economic resources. He has to keep his finances within limits and spend carefully.

## **11. Low Care of Disapprovals of Society.**

A good researcher have no care of the approvals or disapprovals but doing his work with zeal and patience to it.

## **12. Expert in Subject & Trained in Research Tools.**

Research is impossible without its techniques and tools. So, it should be better for a researcher to know about the use of these tools. A researcher would be a good one if he has full command over his subject. He makes the use of his theoretical study in field work easily.

## **13. Free From Hasty Statements & Having Clear Terminology**

It is not expected from a good researcher to make his study hasty and invalid with wrong statements. Its study must be based on reality & validity. A good researcher's terminology would be clear. It would be free from outwards to become difficult for the respondents to answer.

## **14. Dress and Behavior same to the area.**

The dress and the behavior of the researcher should be same as to the study area. it is must for him to convince the people easily and adopt their dress.

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## UNIT II – METHODS OF RESEARCH

Descriptive Methods of Research; Survey Study, Case study, Introduction of Historical Research, Steps in Historical Research, Sources of Historical Research: Primary Data and Secondary Data, Historical Criticism: Internal Criticism and External Criticism.

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### SURVEY STUDY

Surveys are based on the desire to collect information ( usually by questionnaire ) about a well defined issue or situation ( hypothesis) from a well defined population . Surveys are method of data collection in which information is gathered through oral or written questioning. It is a type of research to collect the data and facts about some certain situation or issue from the target population existing in surroundings having relevance to nature of study

### PURPOSE OF SURVEY

1. To provide someone with information ( to describe the situations)
2. To explain the situations ( analytical surveys )
3. Problem Identification & solving
4. To measure the change
5. To study attitudes , behaviour and habits
6. To examine cause – effect relationship
7. To study the characteristics
8. To formulate a hypothesis
9. To test a hypothesis
10. Decision Making

### Types of survey

#### 1. Descriptive survey

“A descriptive survey attempts to picture or document current conditions or attitudes that is, to describe what exists at the moment”

Examples: Audience survey to determine the program taste.

To study the changing values, life style by the effect of some special type of program.

#### 2. Analytical Surveys

“An analytical survey attempts to describe and explain WHY certain situations exist. Here we examine two or more variable to test our research hypothesis”

Examples: How life-style effects the t.v. viewing habits.

Impact of war games on teenagers.

3. Factual surveys. (respondents act as reporters)
4. Opinion surveys. (respondents express his view point opinion).
5. Interpretative surveys. (interpretation ) Example: Why do you read newspapers?

### Steps in the Process of Survey Research

Step 1:- Develop Hypotheses.

Decide on type of survey (mail, interview, telephone).

Write survey questions.

Decide on response categories.

Design layout.

Step 2:- Plan how to record data.

Pilot test survey instrument.

Revise the instrument.

Step 3:- Decide on target population.

Get sampling frame.

Decide on sampling size.

Select sample.

Step 4:-Locate respondents.

Conduct interviews.

Carefully record data.

Step 5 :- Enter data into computers.

Recheck all data.

Perform statistical analysis on data.

Step 6:-Describe methods and findings in research report.

Present findings to others for critique and evaluation.

### Methods of survey

1. Interview Method- Telephone interview.
2. Mail survey - Questionnaire Method

### Interview Method

#### I. Personal Interviews

Interviewing is a form of questioning characterized by the fact that it employs verbal questioning. Together with the questionnaire, interviews make up the survey method, which is one of the most popular techniques of data collection.

<b>Advantages</b>	<b>Disadvantages</b>
Flexibility in questioning	Higher cost.
Control over the interview situation.	Disadvantages.
High response rate	Interviewer bias
Collection of supplement data.	Respondent's hesitation on sensitive topics
-	Greater staff requirement.

### Telephone Interview

Telephone interview demonstrates the same structural characteristics as standard interviewing technique, except that it is conducted by telephone.

<b>Advantages</b>	<b>Disadvantages</b>
Moderate cost	Hesitation to discuss sensitive topics
Less time consumption	The "Broken-Off" interviews
Higher response rate	No supplement information
Quality .....(Supervision , Recording)	-

## II. Questionnaire Method

A questionnaire is a type of research instruments that are composed of successive questions for the sole purpose of gathering information and data from respective respondents. It is often used in surveys and other research purposes since it is cheap, less hassle and easier to derive.

A survey questionnaire is a set of questions used in a survey. The survey questionnaire is a type of data gathering method that is utilized to collect, analyze and interpret the different views of a group of people from a particular population. The survey questionnaire has been used in different fields such as research, marketing, politics views, psychology, etc. People use survey questionnaire to gather the information that is beneficial to a group of individuals. The survey questionnaire uses statistical analysis to collect data, and the result of it will be used in the development of an individual or to a community.

### The Mailed Questionnaire

It is one of the most important data collection survey method. Mail survey involves sending a cover letter and a questionnaire to a specific person.

- Mail survey involves sending a cover letter and a questionnaire to a specific person.
- The cover letter states the purpose sponsor instructions and time of return.
- The questionnaire is totally self explanatory, clear and simple.

<b>Advantages</b>	<b>Disadvantages</b>
Less expensive (no need of interviewers)	Many factors effect on response rate
Quick results	Low education
Less opportunity for bias and errors	Disliking to write
Wide coverage	Disliking to read
Respondents may use personal records	No interest in the topic
Collection of data about sensitive topics	No further explanations
Less time consumption	Lack of understanding of respondents
High response rate.	We receive minimum amount of in formations against open ended questions.
Accessibility	No probing and clarification
-	No identity of the respondent.(some one else can also fill)
-	No supervision
-	partial responses.

### **Structure of the Questionnaire**

There are three main elements:

- The cover letter.
- The instructions.
- The main body.

#### **The Cover Letter**

The cover letter must have the following details;

- The main objectives and social significance of the study;
- The research team and its sponsors;
- The reasons why the respondent should complete the questionnaire;
- Assurance of anonymity and confidentiality;
- Requirements for completion such as maximum time, conditions, etc;
- Issues related to ethics.

#### **The Instructions**

- How to fill the questionnaire?
- To remind the Ethics.
- To request the respondents not to please the researcher.

The Main Body : It includes questions.

Be careful with regard to;

- Content
- Structure
- Format.
- Wording
- Flow

### **Open-Ended and Close-Ended Questions**

#### **I. Close ended questions**

Close ended questions are defined as question types that ask respondents to choose from a distinct set of pre-defined responses, such as “yes/no” or among a set multiple choice questions. In a typical scenario, closed-ended questions are used to gather quantitative data from respondents.

### **Advantages of Close Ended Questions**

1. They are easy to understand hence the respondents don't need to spend much time on reading the questions time and again. Close ended questions are quick to respond to.
2. When the data is obtained and needs to be compared closed ended question provide better insight.
3. Since close ended questions are quantifiable, the statistical analysis of the same becomes much easier.
4. Since the response to the questions are straightforward it is much likely that the respondents will answer on sensitive or even personal questions.

### **Types of Closed Format Questions**

Closed-ended questions aimed at collecting accurate statistical data

It can be classified into 7 types:

1. Leading Questions
2. Importance Questions
3. Likert Questions
4. Dichotomous Questions
5. Bipolar Questions
6. Rating Scale Questions
7. Buying Propensity Questions



## **1. Leading Questions**

A question forcing the target audience to opt for a specific kind of answer is called a leading question. All answers for a leading question are almost similar. Leading questions are usually prepared to derive audience opinion within a set of limited words.

### **Example :**

What do you think about the status of sports in India?

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## **2. Importance Questions**

Questions which ask respondents to rate the importance of some specific matter on a rating scale of 1 to 5 are called importance questions. Such questions facilitate drawing what respondents consider significant - enabling vital business decision-making.

### **Example :**

How do you rate our services?

- 1- Extremely well ; 2- very helpful ; 3- Somewhat helpful; 4- Not very helpful; 5- Not at all helpful

## **3. Likert Questions**

The degree to which respondents agree to a specific statement can be ascertained using Likert questions. Customers' feelings about a topic, product or service can be easily gauged by asking them these questions.

### **Example :**

How often you visit library ?

- 1- Never ; 2- Rarely ; 3- Sometimes ; 4- Often ; 5 – Always

## **4. Dichotomous Questions**

Questions that make respondents answer with a simple "yes" or "no" are called dichotomous questions. These questions carry one disadvantage-there is no other way of analyzing the answer between a "yes" and "no". A middle perspective is not possible.

### **Example :**

Do you think that the infrastructure available in India is sufficient for high level performance ?

YES/ NO

## **5. Bipolar Questions**

Questions that have two answers with different levels of extremities, written at opposite ends of a scale, are called bipolar questions. Respondents have to mark their response anywhere between these two extremities, showing their opinion.

### **Example :**

What is your preference for the following?

I like Going walks ( ) ( ) ( ) ( ) ( ) I like watching

## **6. Rating Scale Questions**

Questions that ask respondents to provide a rating on a specific matter on a scale of 1 to 10 or on a scale of "poor" to "good" are called rating scale questions. Normally, these questions have an even number of choices, so as to prevent respondents to choose a middle way out.

### **Example**

How would you rate the physical education status in India?

1- Good ; 2- Fair; 3- Poor ; 4- Very poor

## **7. Buying Propensity Questions**

These are aimed at assessing customers' future intentions, determining their propensity toward buying a specific product or service. Buying propensity questions help marketers to understand the needs of customers and the probability of their buying a certain product or a service.

### **Example**

If our sports equipment supports guarantee for 5 years , would you think buying about it?

1- Definitely ; 2- Probably ; 3- Probably not ; 4- Not sure 5- Definitely not

## **II. Open ended questions**

Open-ended questions are questions that allow for various response options. Open-ended questions do not expect a particular answer. Rather, they allow the individual providing the response to answer however he chooses.

Examples:

- Where did you go today?
- What was your childhood like?
- How did you decide to enter this profession?
- When would you like to visit the stadium?

### **Advantages**

- No limits on the answers
- Medium for respondents to answer creatively
- Expect the unexpected
- Get answers to complicated situations

## **FRAME WORK OF A QUESTIONNAIRE**

Opening : 1. Show courtesy 2. Awaken the respondents interest on the topic

Early Questions : This should be simple, friendly, close ended, easy to respond & should convey the theme of the study

Middle Questions : Ask the target Questions

Late Questions : Ask optional questions like name ,age etc along with open end questions & should convey the theme of the study

Closing : Build relation, keep scope for future meetings, show gratitude for respondent for responding , leave on a positive note.

## **QUESTIONS TO AVOID IN A QUESTIONNAIRE**

- It is advisable to avoid certain types of questions while preparing a questionnaire, such as:
- **Hypothetical Questions:** Questions with misleading speculation and fantasy should be avoided
- **Embarrassing Questions:** Making respondents feel uncomfortable by asking details about personal or private issues which in turn can lead to losing trust
- **Extreme Positive / Negative Questions:** Care must be taken in designing a question to avoid hard positive or negative overtones

## **CASE STUDY**

### **DEFINITION**

To understand a situation, a sequence of activities, or a procedure to learn what happened, how it happened, and why it happened

A comprehensive, in-depth investigation of a situation, a sequence of activities, or a procedure within its natural setting

### **MATERIALS**

1. Notebook
2. Tape recorder and microphone
3. Pencil
4. Still camera
5. Interview guide
6. Video camera
7. Observation guide

## **STEPS IN DOING A CASE STUDY**

1. Identify topic or focus
2. Design the study
3. Prepare an observation guide
  4. Seek cooperation from people on site in advance
5. Gather information
6. Record the information
7. Validate the information
8. Analyse the information
9. Validate findings with the informants or other community members
10. Prepare a report 1
11. Give a copy of the case study to the community

## **STEPS IN DOING A CASE STUDY**

### **1. IDENTIFY TOPIC OR FOCUS**

- Set a timetable for gathering data
- Select where to do the study
- Decide how to observe and measure it
- Choose what you want to find out
- Decide to study a single case (1 person, group, institution, or process) or multiple case (2+ persons, groups, etc.)
- Select a unit of study: individual, group, institution, process, activity, or system

### **2. DESIGN THE STUDY**

Select a unit of study : individual, group, institution, process , activity or system

- Decide to study a single case ( one person, group, institution, or process) or multiple case ( 2 persons , groups etc )
- Choose what you want to find out
- Decide how to observe and measure it
- Select where to do the study
- Set a timetable for gathering data

### **3. PREPARE AN OBSERVATION AND INTERVIEW GUIDE**

- Observation guide = list of things to observe
- Interview guide = questions to ask

### **4. SEEK COOPERATION FROM LOCAL PEOPLE**

### **5. GATHER INFORMATION**

- Interview people
- Observe
- Secondary data

- Other methods (eg PRA)

## **PARTICIPATORY RURAL APPRAISAL (PRA):**

PRA is an innovative approach to data collection in participatory research. The philosophy is that the researcher is required to acknowledge and appreciate that the research participants have the necessary knowledge and skills to be partners in the whole research process

**PRA TECHNIQUE** : Is a set of approaches and methods to enable rural people to share , enhance and analyze their knowledge of life and conditions to plan and to act.

### **PRA TOOLS :**

- Social Mapping : Capture house location/caste distribution
- Resource Mapping : availability of resources
- Seasonality diagram : Information on the basis of seasons
- Venn diagrams : to identify various issues with relative importance

## **6.RECORD INFORMATION**

- In notebook, field diary or logbook
- Record daily or according to schedule
- Use audio recorder
- Take photos

## **7.VALIDATE INFORMATION**

- Cross-check with multiple sources
- Get information from several informants
- Check Findings with published documents or maps
- Measuring findings directly

## **8. ANALYSE THE INFORMATION**

- Identify themes, variables which are related
- Look for strong evidence
- Rule out competing explanations

## **9.VALIDATE FINDINGS**

- With informants or other community members

## **10.PREPARE REPORT**

- Ensure a narrative flow - easily understandable pattern or progression
- Eg, describe how things began, what led to what, and how events are linked

## **11. GIVE COPY OF FINISHED CASE STUDY TO LOCAL PEOPLE**

### **CASE STUDY PRESENTATION TECHNIQUE**

Case studies are flexible in that they can be presented in a number of ways – there is no specific format to follow. Here is a suggested report outline that could be used in presenting a case study

- I. Introduction and Justification
- II. Methodology
  - a. How was the process carried out? ( Describe the process of selecting the case and data collection sources , as well as how data was collected)
  - b. What assumptions are there ( if any) ?
  - c. Are there any limitations with this method?
  - d. What instruments were used to collect data? ( include in appendix)
  - e. What sample(s) is / are being used?
  - f. Over which period of time was this data collected?
- III. The Problem
- IV. The Steps taken to Address the problem
- V. The Results
- VI. The challenges and how they were met
- VII. Beyond results
- VIII. Lessons learnt
- IX. Conclusion
- X. Appendices

### **HISTORICAL RESEARCH**

The study of the past, particularly how it relates to humans. .It is an umbrella term that relates to past events as well as the memory, discovery, collection, organization, presentation, and interpretation of information about these events

Historical Research is Systematic collection and evaluation of data to describe, explain, and thereby understand actions or events that occurred sometime in the past. .No manipulation or control of variables and primarily focuses in the past.

#### **Purpose of Historical Research**

- To test hypothesis concerning relationships or trends and to assist in prediction.
- To make people aware of what has happened in the past so they may learn from past failures and successes.
- To learn from past successes and failures
- Learn how things were done in the past and apply them to current or future events
- To assist prediction
- Understand the present practices and policies by understanding the history surrounding them
- It throws light on present and future trends

- It enables understanding of and solutions to contemporary problems to be sought in the past
- It can illuminate the effects of key interactions within a culture or sub – culture
- It allows for the reevaluation of data in relation to selected hypotheses, theories and generalizations that are presently held about the past and the present

Examples:

1. How were students educated in the South during the Civil War? What was instruction like in a typical fourth-grade classroom 100 years ago? How have working conditions for teachers changed since 1900?
2. What were the major discipline problems in schools in 1940 as compared to today?

**Characteristics of Historical Research**

- It aim for critical search for truth.
- The aim of contemporary history is to conceptualise, contextualise and historicise – to explain –
- •There is no agreed definition of what time period constituted contemporary history has existed – or can exist.
- It is not a mere accumulation of facts and data or even a portrayal of past events
- It is a flowing, vibrant report of past events which involves an analysis and explanation of these occurrences with the objective of recapturing the nuances, personalities and ideas that influenced these events.
- Conducting historical research involves the process of collecting and reading the research material collected and writing the manuscript from the data collected.

**Steps/ Methods of Historical Research**

1. Defining the Problem
2. Gathering of Source Materials
3. Criticisms of Data
4. Presentation of facts

**1. Defining the Problem**

Historical Research is an elusive Subject-matter about the past, and the peculiarly difficult task of interpretation which this is elusive nature of then subject matter .It will describe clearly and accurately some aspect of the past as it related to education and/or schooling. It will take a look one by one at the important motives or reasons which caused you to doubt or to get interested about certain gaps in knowledge in relation to a past event or experience. It focus on individual institutions, curricula, facilities, textbooks ,projects or programs ,procedures ,events, concepts ,structures and processes, phenomena ideas. In defining the Problem you may limit your investigation in one era or epoch and one sequence of events in a local, provincial, regional,

or national setting. . It is comparison of events in different periods, different societies, or different civilizations.

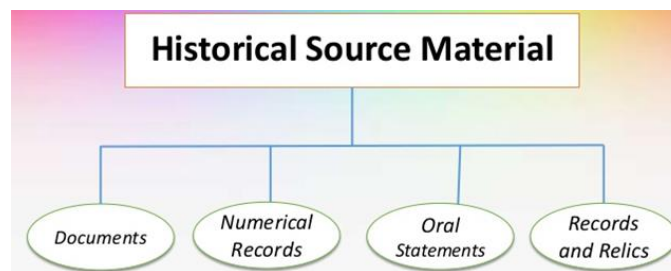


**Examples:**

- “The Schooling Process in First Grade: Two Samples a Decade Apart”
- “Origins of the Modern Social Studies”

**2.Gathering of Source Materials**

It is the varied evidences of the activities engaged in by people who lived in the past.Historical Source Materialare Documents, Numerical Records ,Oral Statements and Records and Relics.



**Documents :**

- Documents are written or printed materials that have been produced in some form or another .
- It may be published or unpublished
- It may be intended for private or public consumption
- It may be original works or copies.

Examples : artwork, bills, books, cartoons, circulars, court records, diaries, diplomas, legal records, newspapers, magazines, notebooks, school yearbooks, memos, tests, and so on.



## **Numerical Records**

- It is either as separate type of source in and of themselves or as subcategory of documents.
- Any type of numerical data in printed form Numerical Records

Examples : test scores, attendance figures, census reports, school budgets, and the like.  
Numerical Records

## **Oral Statements**

Forms of oral expression have been used by people through the ages to leave a record for future generation. Example :stories, myths, tales, legends, chants, songs Oral Statements

## **Records and Relics**

Any object whose physical or visual characteristics can provide some information. Examples: furniture, artwork, clothing, buildings, monuments, or equipment. Records and Relics

### **DIFFERENCES BETWEEN PRIMARY AND SECONDARY RESOURCES**

S.no	PRIMARY SOURCE	SECONDARY SOURCE
1.	Primary source is regarded as the source of the “best evidence”.  Ex. One prepared by an individual who a participant was in or a direct witness to the event being described.	Secondary source are information supplied by a person who was not a direct observer or participant of the event, object, or condition. Ex. A document prepared by an individual who was not a direct witness to an event but who obtained his or her description of the event from someone else.
2.	It is an original , first hand record or account or artifact that has survived from the past	It is an account of the pas greated after the event or created from primary sources
3.	It has direct involvement with the event being investigated	It has not direct involvement with the event being investigated
4.	For having direct physical relationship the possibility of error is very little	It is very possible that secondary sources contain errors due to passing of information from one source to another
5.	Primary sources has no dependency on secondary resources	Secondary sources are totally dependent upon primary sources
6.	Researchers are reliable on primary sources	Researchers do not rely on secondary sources

### **3.CRITICISMS OF DATA**

Criticism - Garraghan divides source criticism into six inquiries

- When was the source, written or unwritten, produced (date)?
- Where was it produced (localization)?
- By whom was it produced (authorship)?
- From what pre-existing material was it produced (analysis)?
- In what original form was it produced (integrity)?
- What is the evidential value of its contents (credibility)?

**EXTERNAL CRITICISM** Involves finding out if the source material is genuine and if it possesses textual integrity (Gay, et al., 1972)

- “Is it genuine?”
- Who was the author?
- What were his general qualifications as a reporter?
- What were his special qualifications and disqualifications as a reporter of the Matters treated here?
  
- Who wrote the document?
- For what purpose was the document written?
- When was the document written?
- Where was the document written?
- Under what conditions was the document written?
- Do different forms or versions of the document exist?
- How soon after the events was the document written?
- How was the document written?
- How is the document related to other documents?

### **INTERNAL CRITICISM**

- It is concerned with the accuracy and meaning of the data contained in the document. - Textual criticism
- It is the Literal meaning and real meaning of statements Ex: Words do not have the same meaning to all people .
- It reflects the competence of the Observer
- It elicits the Tests of Truthfulness and Honesty Ex: “What is the personal or vested interest of the author, if any?” To what race, nation, party, region, social level, economic group, or profession, which might introduce elements of bias does the observer belong?”

It answers to the questions such as

- What does it mean?
- What was the author attempting to say?
- What thought was the author trying to convey?
- What inferences or interpretation could be extracted from the words?
- What was meant by the author?

- How much credibility can be given to the author?
- What was the author trying to say?
- How could the authors word be interpreted?
- Does the document contain bias of any sort?

**5. Presentation of facts**

A well written history provides information of the condition of the past . The writing of history demands a careful avoidance of the following facts

Over signifying of the facts

Over generalization from insufficient evidence

Failure to establish difference between significant and trivial facts

Tendency to use secondary data

Personal bias

Failure to interpret words and expression in the light of their usage in earlier times

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## UNIT- III

### **Unit- III- Experimental Research**

Experimental Research – Meaning, Nature and Importance, Meaning of Variable, Types of Variables. Experimental Design - Single Group Design, Reverse Group Design, Repeated Measure Design, Static Group Comparison Design, Equated Group Design, Factorial Design

Meaning of variable: Variable is having the capacity of varying or changing; capable of alteration in any manner ; changeable Example: strength, speed, tension, motivation, height, weight, heart rate etc

Types of variables: (1) Independent variable (2) Dependent variable

Independent variable: The variable which is manipulated by the experimenter is called independent variable. It is often called the treatment, experimenter antecedent variable.

Dependent Variable: The dependent variable is the condition or characteristic that appears, disappears, or changes as the experimenter introduces, removes or changes independent variable. It is also called criterion or predicted variable . Ex: test scores, measuring speed, strength etc.

Experimenter: The person who conducts the experiment or manipulates the experimental conditions is called as the experimenter.

Subject: The living organism that is studied is called the subjects or the respondent.

Control group: The group that does not receive any experimental treatment is called as the control group.

Experimental group: The group that is given treatment (independent variable) is called as experimental group.

Pre- test: The test that is administered to the subjects before the independent variable is called the pre- test

Post- test: The test that is administered to the subjects after the independent variable is called the post test.

### **NATURE AND MEANING OF EXPERIMENTAL RESEARCH :**

Experiment means ‘test’ or ‘trial’ . In other words experiment means ‘ for testing hypothesis’ or ‘to demonstrate known fact’ or procedure adopted to chance of its succeeding’. Experiments deal with cause and effect . In an ideally designed experiment , the research concludes with an understanding not only of what happened but why it happened? .

Experimental research describes ‘ what will be when all relevant conditions are carefully controlled’. Experimental research provides a systematic and logic method of answering the question. Experiments are powerful tools when properly designed they represent the most systematic approach. It is a method of research where two groups are selected and compared. These comparisons may be relating to their behavior, feelings or emotions. Experimental research has two facets (1) Field experimentation (2) Laboratory experimentation.

The aim of experimental research is to gain new knowledge by collection of facts through observations under controlled conditions. The control may be applied in the laboratory setting up, where the variables are held constant by experimental procedures and it can be determined if the effect is the influence of a single variable or combination of variables.

The control variables may be allowed to operate in a natural and normal setting. In both instances, the ( 1) Identification of population ( 2) selection of subjects ( 3) duration of the experiment (4) and elimination of extraneous influences must be decided before experimentation begins.

Experimental method is designed ‘to determine influences , both qualitatively and quantitatively on a given phenomenon or to determine influences between or among variables. It is the only method which is objective, reliable, precise and accurate because its design demand ‘controlled observation’. Controls may be applied in a laboratory setting as well as in field settings.

Example: Effect of interval training on the performance of endurance among school athletes.

### **PLANNING FOR EXPERIMENTAL RESEARCH**

1. Identification and designing the problem.
2. The condition under which the experiment will be administered and the place.
3. The subjects to be used to measure the influence of variables.
4. The instruments to be used to measure the influence of variables
5. The variables to be included or excluded.
6. The pattern of experimental design to be used.
7. The time and duration of the experiment.
8. The statistical method which most effectively determines the result of the experiment.
9. The degree of precision needed to yield result worthy of generalization.
10. The nature and extent of pilot investigations before beginning the experiment
11. Planning includes the tester’s competency and forming hypothesis.

## **STEPS IN EXPERIMENTAL RESEARCH**

1. Selecting and delimiting the problem
2. Reviewing the literature
3. Drawing up experimental design
4. Defining the population
5. Carrying out the study.
6. Measuring the out comes
7. Analysis and interpreting the outcomes
8. Drawing up conclusions.
9. Reporting the results.

## **EXPERIMENTAL DESIGNS**

Etymologically , the term ‘design’ means plan, blue print, make a sketch etc.,. Experimental design is to the researcher what a blue print is to the architect. It enable the researcher to test hypothesis by reaching valid conclusions about relationships between independent and dependent variable. Research design is the logical and systematic planning and directing of a piece of work. It acts as a guide to achieve the decided goal of a researcher step by step. Selection of the particular design is based on the (1) purposes of the experiment (2) the type of variables to be manipulated ( 3) nature of the data ( 4) and the conditions or limiting factors under which it is conducted.(5) facilities of the conditions for carrying out the the experiment (6) competence of the experimenter.

### **Causal or Experimental Research Designs**

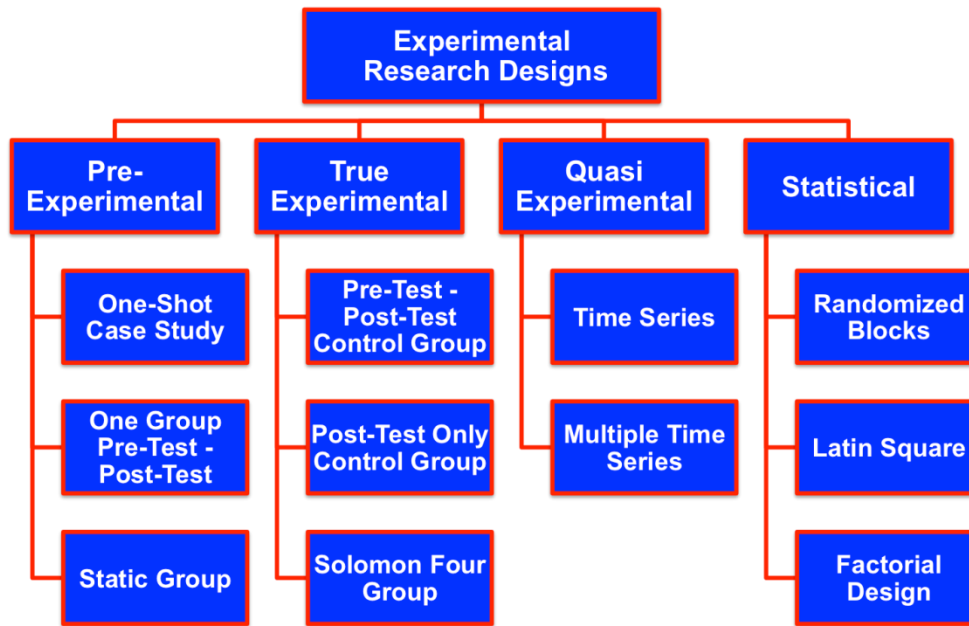
With an experimental research design, the researcher lays out how he or she will manipulate one of more independent variables and measure their effect on the dependent variable. Some research designs involve no manipulation of independent variables. These non-experimental designs are called *ex post facto*, or after the effect, studies.

An experimental design must deal with four issues:

1. The people who participate in the experiment.
2. The independent variable or variables, which are also called the treatment variables. These are the variables the researchers manipulate during the experiment.
3. The dependent variable, or the effect that the researchers measure.
4. The plan for controlling extraneous variables.

### **Types of Experimental Research Designs**

Experimental research designs can be classified into the following typology:



### Experimental Design Symbols

Symbol	Meaning
<b>O</b>	<b>A formal observation or measurement</b>
<b>X</b>	<b>Exposure to the Experimental Treatment</b>
<b>EG</b>	<b>Experimental Group: Test units exposed to a treatment</b>
<b>CG</b>	<b>Control Group: Test units not exposed to a treatment</b>
<b>R</b>	<b>Random assignment of test units to the EG and CG</b>
<b>M</b>	<b>Assignment to a EG or CG are balanced to assure that the EG and CG are roughly equal.</b>

## Pre-Experimental Designs

Pre-Experimental Designs are the simplest form of experimental research designs. Pre-experimental designs have little or no control over extraneous variables. And, these designs do not randomly assign subjects to different treatments. As a consequence, the results of a test using a pre-experimental design are difficult to interpret. These designs are often used in testing television commercials because they are simple and relatively inexpensive.

There are three types of pre-experimental designs: One-Shot Case Studies, One Group Pre-Test - Post-Test, and Static Group tests

**A. One-Shot Case Studies:** With a one-shot case study, test units—people, test markets, etc.—are exposed to a treatment. The standard notation for a treatment "X." A single measurement of the dependent variable is taken ( $O_1$ ). There is no random assignment of test subjects as there is only one treatment, and there is no control. Here is the standard notation for a One-Shot Case Study:

### One-Shot Case Study

$X O_1$

This research design has two significant flaws: 1) there is no pre-test and 2) there is no control group. A control group would, in this case, be a group that did not receive the treatment. Without these restraints, this research design cannot establish internal or external validity.

Despite these limitations, market researchers often use this design for testing new-to-the-market products.

**B. One Group Pre-Test - Post-Test:** With this research design the test unit is measured twice, one before the test and once after the test. There is still no control group; which is to say, a group not receiving the treatment. Here is the standard notation for a one-group pre-test - post-test study:

### One-Group Pre-Test - Post-Test

$O_1 X O_2$

Marketing researchers often use this design to test changes in the marketing plan for established products. Compared to One-Shot Case Studies, this design has the advantage of taking two measurements: one before and the other after exposure to the treatment. This allows the researcher to estimate the treatment effect by subtracting the pre-test measure from the post-test measure. But, given the lack of a control, the validity of the conclusions are questionable. Extraneous variables like history can affect the results because the observed changes in the dependent variable might be due to factors outside the research design. And, maturation can also be a problem as the observed changes to the dependent variable might be due to changes in the test subjects that are not related to the treatment.

**C. Static Group Design:** With the Static Group design there is a Control Group (CG) in addition to the Experimental Group (EG). The experimental group is exposed to the treatment while the control group is



not. Test units, however, are not randomly assigned to the control or experimental groups. Here is the standard notation for a Static Group study:

## Static Group Design

EG: X O<sub>1</sub>

CG: O<sub>2</sub>

Measurements for both groups are made after the treatment is administered to the experimental group. The treatment effect is measured as O<sub>1</sub> - O<sub>2</sub>.

Weaknesses of this research design stem from the fact that test units are not randomly assigned to the experimental or control groups and there are no pre-test measurements taken.

## True Experimental Designs

True Experimental Designs are where the market researchers assign test units to treatments at random. There are three basic types of True Experimental Designs: Post-Test Only Control Group Design, Pre-Test Post-Test Control Group Design, and Solomon Four Group Design.

### A. Post-Test Only Control Group Design:

With this research design, test units are randomly assigned to the experimental and control groups. The experimental group is exposed to the treatment and then both the experimental and control groups are measured. But, there is only one measurement is taken.

Here is the standard notation for a Post-Test Only study:

## Post-Test Only Control Group Design

EG: R X O<sub>1</sub>

CG: R O<sub>2</sub>

R = Random Assignment

The effect of the treatment is calculated as O<sub>1</sub> - O<sub>2</sub>.

The advantage of this research design is that the random assignment of the test units should produce roughly equal control and experimental groups before the treatment is administered. And, the mortality for the control and experimental groups should be similar.

### B. Pre-Test - Post-Test Control Group Design:

With this research design, test units are randomly assigned to experimental and control groups. A pre-test measure is taken from both groups.

Here is the standard notation for a Pre-Test - Post-Test Control Group study:

**Pre-Test - Post-Test  
Control Group Design**

<b>EG:</b>	<b>R</b>	<b>O<sub>1</sub></b>	<b>X</b>	<b>O<sub>2</sub></b>
<b>CG:</b>	<b>R</b>	<b>O<sub>3</sub></b>		<b>O<sub>4</sub></b>

**R = Random Assignment**

Selection bias is controlled by the randomized assignments of test units. Mortality can be a problem if it is not relatively equal between the experimental and control groups. History can also be an issue if these factors effect the experimental and control groups unequally.

The treatment effect or TE is measured by  $(O_2 O_1) - (O_4 O_3)$ .

**C. Solomon Four Group Design:**

The Solomon Four Group Design is a research design that assesses the impact of pretesting on subsequent measures. It is used when the researcher suspects that earlier tests influence the results of later tests. With this research design, test units are randomly allocated to two experimental groups and two control groups. One of the experimental groups and one of the control groups is measured. Both experimental groups are then exposed to a treatment. Afterwards, both experimental and control groups are measured. A total of six measurements are taken. The design aims to account for pre-testing bias and pre-test manipulation interaction bias.

Here is the standard notation for a Solomon Four Group study:

**Solomon Four  
Group Design**

<b>EG<sub>1</sub></b>	<b>R<sub>1</sub></b>	<b>O<sub>1</sub></b>	<b>X</b>	<b>O<sub>3</sub></b>
<b>CG<sub>1</sub></b>	<b>R<sub>2</sub></b>	<b>O<sub>2</sub></b>		<b>O<sub>4</sub></b>
<b>EG<sub>2</sub></b>	<b>R<sub>3</sub></b>		<b>X</b>	<b>O<sub>5</sub></b>
<b>CG<sub>2</sub></b>	<b>R<sub>4</sub></b>			<b>O<sub>6</sub></b>

**Quasi-Experimental Designs**

Quasi-Experimental Designs are used when the researcher creates an artificial environment to control for extraneous variables. With quasi-experimental designs, the research lacks control

over when the treatment is administered or assigns test units to the experimental and control groups in a non-random fashion. There are two basic types of quasi-experimental designs: Time Series and Multiple Time Series.

**A. Time Series:** There is no randomization of the test units to the treatments. The timing of the treatment presentation as well as which test units are exposed to the treatment may not be within the researcher's control. Consumer Attitude & Usage panels are an example of quasi-experimental designs using Time Series.

Here is the standard notation for a Time Series study:

**Time Series Design**  
O<sub>1</sub> O<sub>2</sub> O<sub>3</sub> O<sub>4</sub> O<sub>5</sub> X O<sub>1</sub> O<sub>2</sub> O<sub>3</sub> O<sub>4</sub> O<sub>10</sub>

The advantages of Time Series are that it is easier to interpret the results than a One Group Pre-Test - Post-Test design because of the many measures it takes. The multiple measures help determine underlying trends. But, the Time Series design has two weaknesses. First, researchers cannot control history. Second, given the repeated measures there is a testing effect on the subjects. Subjects may become more aware of their shopping habits, which could influence the results of the study.

**B. Multiple Time Series:** With the Multiple Time Series, the researchers add a control group to the research design. The addition of a control group enhances the researchers' ability to discern the treatment effect.

Here is the standard notation for a Multiple Time Series study:

**Multiple Time Series Design**  
EG O<sub>1</sub> O<sub>2</sub> O<sub>3</sub> O<sub>4</sub> O<sub>5</sub> X O<sub>1</sub> O<sub>2</sub> O<sub>3</sub> O<sub>4</sub> O<sub>10</sub>  
CG O<sub>1</sub> O<sub>2</sub> O<sub>3</sub> O<sub>4</sub> O<sub>5</sub> X O<sub>1</sub> O<sub>2</sub> O<sub>3</sub> O<sub>4</sub> O<sub>10</sub>

## Statistical Designs

Statistical Designs are a collection of basic experimental designs that offer researchers the ability to statistically control and analyze external variables. Statistical control uses various sophisticated statistical techniques to exclude the influence of extraneous variables from an analysis.

The most commonly used Statistical Research Designs are the Randomized Block Design, the Latin Square Design, and the Factorial Design. These designs offer the following advantages: 1) The effects of multiple independent variables on the dependent variable can be measured, 2) Specific extraneous variables can be statistically controlled, and each test unit can be measured more than once with these economically efficient designs. These designs are beyond the scope of an introductory Marketing Research class. We will not, therefore, cover them in any detail.

## **UNIT IV – SAMPLING**

Meaning and Definition of Sample and Population. Types of Sampling; Probability Methods; Systematic Sampling, Cluster sampling, Stratified Sampling. Area Sampling – Multistage Sampling. Non- Probability Methods; Convenience Sample, Judgment Sampling, Quota Sampling

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### **Sampling**

The process of selecting a number of individuals for a study in such a way that the individuals represent the larger group from which they were selected. A sample is “a smaller (but hopefully representative) collection of units from a population used to determine truths about that population” (Field, 2005)

In research terms a sample is a group of people, objects, or items that are taken from a larger population for measurement. The sample should be representative of the population to ensure that we can generalise the findings from the research sample to the population as a whole.

A sample is defined as a smaller set of data that is chosen and/or selected from a larger population by using a predefined selection method. These elements are known as sample points, sampling units or observations. Creating a sample is an efficient method of conducting research as in most cases, it is impossible or very expensive and time consuming to research the whole population and hence researching the sample provides insights that can be applied to the whole population.

### **Population**

A research population is generally a large collection of individuals or objects that is the main focus of a scientific query. This is the reason why researchers rely on sampling techniques. A research population is also known as a well-defined collection of individuals or objects known to have similar characteristics. Population is a group of people, events, or things of interest that the researcher wishes to investigate.

Population= universe the entire group under study as defined by research objectives.

- 1) Target population: is the entire group a researcher is interested in . For example: Target population: consist of all diabetic people in the INDIA
- 2) Accessible Population: readily available to “access “. It consist of all diabetic people who are members of a particular health plan

Element: A single member of the population.

Sample: Some members selected from population.

Sampling Unit: The element that is available for selection

Subject: Single member of the sample.

Parameters: Characteristics of the population

## **TYPES OF SAMPLING**

Sampling takes on two forms in statistics:

1. Probability sampling and 2. Non-probability sampling:

Probability sampling uses random sampling techniques to create a sample.

Non-probability sampling techniques use non-random processes like researcher judgment or convenience sampling.

### **1. Probability Sampling**

Probability sampling is based on the fact that every member of a population has a known and equal chance of being selected. For example, if you had a population of 100 people, each person would have odds of 1 out of 100 of being chosen. With non-probability sampling, those odds are not equal. For example, a person might have a better chance of being chosen if they live close to the researcher or have access to a computer. Probability sampling gives you the best chance to create a sample that is truly representative of the population.

### **Types of Probability Sampling**

- **Simple random sampling** is a completely random method of selecting subjects. These can include assigning numbers to all subjects and then using a random number generator to choose random numbers. Classic ball experiments are another example of this process (assuming the balls are sufficiently mixed). The members whose numbers are chosen are included in the sample.
- **Stratified Random Sampling** involves splitting subjects into mutually exclusive groups and then using simple random sampling to choose members from groups.
- **Systematic Sampling** means that the researcher choose every “nth” participant from a complete list. For example, researcher could choose every 10th person listed.
- **Cluster Random Sampling** is a way to randomly select participants from a list that is too large for simple random sampling. For example, if you wanted to choose 1000 participants from the entire population of INDIA , it is likely impossible to get a complete list of everyone. Instead, the researcher randomly selects areas (i.e. cities or counties) and randomly selects from within those boundaries.
- **Multi-Stage Random sampling** uses a combination of techniques.

### **Advantages**

- Cluster sampling: convenience and ease of use.
- Simple random sampling: creates samples that are highly representative of the population.
- Stratified random sampling: creates strata or layers that are highly representative of strata or layers in the population.

- Systematic sampling: creates samples that are highly representative of the population, without the need for a random number generator.

### **Disadvantages**

- Cluster sampling: might not work well if unit members are not homogeneous (i.e. if they are different from each other).
- Simple random sampling: tedious and time consuming, especially when creating larger samples.
- Stratified random sampling: tedious and time consuming, especially when creating larger samples.
- Systematic sampling: not as random as simple random sampling,

## **2. Non-probability sampling**

Non-probability sampling is a sampling technique where the samples are gathered in a process that does not give all the individuals in the population equal chances of being selected.

Non-probability sampling is a sampling technique where the odds of any member being selected for a **sample cannot be calculated**. It's the opposite of probability sampling, where you *can* calculate the odds. In addition, probability sampling involves random selection, while non-probability sampling does not—it relies on the subjective judgement of the researcher. The odds do not have to be equal for a method to be considered probability sampling.

For example, one person could have a 10% chance of being selected and another person could have a 50% chance of being selected. It's non-probability sampling when you **can't calculate the odds at all**.

### **Types of Non-Probability Sampling**

1. **Convenience Sampling** : is probably the most common of all sampling techniques. With convenience sampling, the samples are selected because they are accessible to the researcher. Subjects are chosen simply because they are easy to recruit. This technique is considered easiest, cheapest and least time consuming.

#### **Advantages of Convenience Sampling**

- It's relatively easy to get a sample.
- It's inexpensive, compared to other methods.
- Participants are readily available.

#### **Disadvantages of Convenience Sampling**

The method cuts out a large part of the population. As a result, this leads to several issues, including:

- An inability to generalize the results of the survey to the population as a whole.

- The possibility of under- or over-representation of the population.
- Biased results, due to the reasons why some people choose to take part and some do not.

2. **Consecutive Sampling** : is very similar to convenience sampling except that it seeks to include ALL accessible subjects as part of the sample. This non-probability sampling technique can be considered as the best of all non-probability samples because it includes all subjects that are available that makes the sample a better representation of the entire population.

### **Advantages of Consecutive Sampling**

- In consecutive sampling technique, the researcher has many options when it comes to sample size and sampling schedule. The sample size can vary from a few to a few hundred, that the kind of range of sample size we are talking about here.
- In this sampling technique, sampling schedule is completely dependent on the nature of the research, a researcher is conducting. If a researcher is unable to obtain conclusive results with one sample, he/she can depend on the second sample and so on for drawing conclusive results.
- In consecutive sampling, a researcher can fine-tune his/her researcher. Due to its repetitive nature, minor changes and adjustments can be made right at the beginning of the research to avoid considering research bias.
- Very little effort is needed from the researcher's end to carry out the research. This technique is not time-consuming and doesn't require extensive workforce.

### **Disadvantages of Consecutive Sampling**

- This sampling method cannot be considered as a representative of the entire population. The only way this sampling technique can get any closer to representativeness is by using a large sample size that represents a population.
- Since there is a disadvantage of a sample obtained cannot be randomized, results or conclusions drawn through this sampling technique cannot be used to represent an entire population.

3. **Quota Sampling** : is a non-probability sampling technique wherein the researcher ensures equal or proportionate representation of subjects depending on which trait is considered as basis of the quota. For example, if basis of the quota is college year level and the researcher needs equal representation, with a sample size of 100, he must select 25 1st year students, another 25 2nd year students, 25 3rd year and 25 4th year students. The bases of the quota are usually age, gender, education, race, religion and socioeconomic status.

### **Advantages:**

- Easy to administer.
- Fast to create and complete.
- Inexpensive.
- Takes into account population proportions, if desired.
- Can be used if probability sampling techniques are not possible.

**Disadvantages:**

- Selection is not random.
- Selection bias poses a problem. For example, you might avoid choosing people who live farther away, or people in rough neighborhoods. This may make the result unrepresentative of the population.

4. **Judgmental Sampling** : is more commonly known as purposive sampling. In this type of sampling, subjects are chosen to be part of the sample with a specific purpose in mind. With judgmental sampling, the researcher believes that some subjects are more fit for the research compared to other individuals. This is the reason why they are purposively chosen as subjects

**Advantages of Judgment Sampling :**

Judgment sampling is less time consuming than other sampling techniques.

Judgment sampling allows researchers to go directly to their target population of interest.

Disadvantage of Judgment Sampling : Judgment sampling is prone to researcher bias.

5. **Snowball Sampling** : is usually done when there is a very small population size. In this type of sampling, the researcher asks the initial subject to identify another potential subject who also meets the criteria of the research. The downside of using a snowball sample is that it is hardly representative of the population.

**Advantages:**

- It allows for studies to take place where otherwise it might be impossible to conduct because of a lack of participants.
- Snowball sampling may help you discover characteristics about a population that you weren't aware existed. For example, the casual illegal downloader vs. the for-profit downloader.

**Disadvantages:**

- It is usually impossible to determine the sampling error or make inferences about populations based on the obtained sample.

Snowball sampling is also known as cold-calling, chain sampling, chain-referral sampling, and referral sampling.

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## **UNIT- V Research Proposal and Report**

Chapterization of Thesis / Dissertation, Front Materials, Body of Thesis – Back materials. Method of Writing Research proposal, Thesis / Dissertation; Method of writing abstract and full paper for presenting in a conference and to publish in journals ,Mechanics of writing Research Report, Footnote and Bibliography writing.

**Thesis:** “A written work resulting from original research, especially one submitted for higher degree in a university”

### **Why write a thesis?**

- Science aims to find pattern, trends, and structure in the experiment
- Good scientific writing aims to bring forward in the text
- Structure
- Organization of scientific knowledge

## **CHAPTERIZATION OF THESIS**

The entire research work will run into five chapters.

The first one on Introduction brings out the importance of the study, and states its objectives and hypotheses. It also includes methodology and limitations.

### **Chapter 1: Introduction**

- Problem Statement: Why is this research important?
- What are the objectives of this study?
- What are the testable hypotheses?
- Outline of thesis/dissertation. What do the next chapters cover?

### **Chapter 2: Review of Related Literature**

- It will contain previous reviews, history of the Problems. A Quick look on subjective well-being will also be carried out in chapter II.
- Compare/contrast previous literature with what you intend to do.  
How does your intended work extend the knowledge frontier

### **Chapter 3: Research Methodology**

It will be a methodological part of the study.

- Develop the theoretical framework underlying this research.
- How would results from the testable hypotheses alter or support the proposed theoretical framework?

- How sturdy is this theoretical framework? Are there short-comings?

#### **Chapter 4: Results and Discussions**

- Data Specifications and Collection Procedures
- Analysis and Discussions is to be done in this chapter
- Background information about data sources.
- Variable descriptions.
- Sampling procedures.
- Descriptive statistics.

#### **Chapter 5: Summary, Conclusions and Recommendations**

Findings, Conclusions and Suggestions for further Research will be presented in Chapter V followed by Bibliography and References.

- Summarize your findings.
- Given your empirical results, what do you conclude?
- Based on your results and conclusion, what do you recommend?
- What are the limitations of your research? What else could be done? What do you recommend for future research based on your findings?

#### **Front Materials, Body of Thesis – Back materials.**

1. Title Page
2. Approval Sheet
3. Abstract
4. Acknowledgment
5. Dedication
6. Table of Contents
7. List of Tables
8. List of Figures

#### **1. TITLE PAGE**

The following information needs to be on the title page:

- The title (and possibly the subtitle) of your thesis
- First name and surname of the author(s)
- Whether it is a 'Bachelor's thesis' or a 'Master's thesis'
- Faculty and department
- Place and date of completion

#### **2. APPROVAL SHEET**

- This is to prove that the authors have passed the requirements needed for the thesis
- This is signed by the thesis supervisor, panel and the Dean.
- This also states the grade obtained by the author/s.

### **3 . ABSTRACT**

- An abstract presents a brief summary of your thesis.
- The aim of the abstract is to briefly provide the reader with the most important information from the entire text.
- An abstract never contains new information.
- This summary is no longer than 2 pages of A4.

### **4. ACKNOWLEDGMENT**

This is a page focused on expressing gratitude to organizations, agencies or individuals who, in one way or another, have aided the researchers in finishing the thesis.

### **5. DEDICATION**

This is the page for dedicating the thesis to certain people or groups who have inspired the researchers while doing the thesis.

### **6.TABLE OF CONTENTS**

- The table of contents is essentially a topic outline of the thesis
- .It is compiled by listing the headings in the thesis down to whichever level you choose.

### **7. LIST OF TABLES / LIST OF FIGURES**

- Include a list of figures (illustrations) and a list of tables if you have one or more items in these categories.
- Use a separate page for each list.
- List the number, caption, and page number of every figure and table in the body of the thesis.

## **BODY OF THESIS**

### **TITLE OF CHAPTERS**

Chapter – I Introduction

Chapter – II Review of Related Literature

Chapter- III Methodology

Chapter- IV Results and Discussions

Chapter- V Summary , Conclusion and Recommendations

## **Chapter I : Introduction and Background of the Study**

### **Introduction**

The first chapter of your thesis is your introduction. . This is where to provide an introduction to the topic of thesis: The researcher should give the context in terms of content of the research project

### **Significance of the Study**

- The significance of the study will mainly focus on the question “Who will benefit from the study?”
- This section will state the contribution of your study and the usefulness of your study in the society.

### **Statement of the Problem**

- The problem must be reflected to the title or the readers must know the problem by just simply reading the topic
- The problem must not be answerable by yes or no and must be arranged in the flow of documentation or study.

### **Framework**

- A conceptual framework elaborates the research problem in relation to relevant literature. This section may summarize the major (dependent and independent) variables in research. The framework may be summarized in a schematic diagram that presents the major variables and their hypothesized relationships. It should also cover the following
  1. Existing research and its relevance for your topic
  2. Key ideas or constructs in your approach
  3. Identify and discuss the variables related to the problem.
  4. Conceptualized relationships between variables
  5. Independent variables (presumed cause)
  6. Dependent variables (presumed effect)
  7. Intervening variables (other variables that influence the effect of the independent variable)

### **Instructional Materials and Equipment commonly used**

- 1 . Traditional Materials equipment
- 2 . Technological Equipment

**Profile of the respondents :** Age, Gender ,Civil Status, Educational Attainment, Years of Service

**Scope and Delimitation :** The scope is mainly the coverage study and the Delimitation is the limitation of study or topic.

**Definition of Terms :** The definition of terms must be arranged in alphabetically. It must be also stated definition of terms in technically or operationally.

## **Chapter II - Review of Related Literature and Studies**

### **Related Literature**

In this part the researcher should get data and information from any books, magazines, and news papers. He must label published material with local or foreign.

1. Must be also organized to cover specific problems.
2. Must take all the evidences about the problem with the author's experiences.
3. As much as possible, get the latest published materials. Avoid old published materials.
4. It must be related to your topic. If not, do not get it.
5. On the last part of this part you must have a statement how this old published material helps the researcher in their current study and relate it to your study.

### **Related Studies**

In this part the reseacher must get data and information from unpublished material such as previous or old study, research or thesis. In some format, he must label his unpublished material with local or foreign

1. This should be organized to cover the specific problems
2. You must take note all of the evidences that the previous researcher came up
3. The unpublished material should not be older than 5 years if possible
4. It must be related to your topic. If not, do not get it.
5. On the last part of this part you must have a statement how this old unpublished material helps the researcher in their current study and relate it to study.

## **Chapter III -Methodology of the Study**

**Research Design :** The appropriate research design should be specified and described.

**Population and Samples :** Describe the population of interest and the sampling of subjects used in the study.

**Research Instrument :** Describe the instrument and what it will measure.State qualifications of informants if used in the study.

**Validation Procedure :** Discuss how the validity and the reliability will be established. Specify the level of reliability (probability).

**Data Gathering Procedure :** Describe how instrument will be administered.

**Data Processing Procedure and Statistical Treatment of Data :** Describe the processing and treatment of data

#### **Chapter IV- Presentation, Analysis and Interpretation of Data**

**Presentation of Data :** Present the findings of the study in the order of the specific problem as stated in the statement of the Problem.

Present the data in these forms: – Tabular – Textual – Graphical (optional)

**Analysis of data :** Data may be analyzed quantitatively or qualitatively depending on the level of measurement and the number of dimensions and the data presented in the table. Avoid table reading. State statistical descriptions in declarative sentences, e.g. in the studies involving:

#### **Interpretation of Data**

- Establish interconnection between and among data
- Check for indicators whether hypothesis/es is/are supported or not by findings.
- Link the present findings with the previous literature
- Use parallel observations with contemporary events to give credence presented in the introduction.

#### **Chapter V : Summary of Findings, Conclusions and Recommendations**

**Summary of Findings :** This describes the problem, research design, and the findings (answer to the questions raised). The recommended format is the paragraph form instead of the enumeration form.

For each of the problems, present: – The salient findings, – The results of the hypothesis tested

#### **Conclusions**

- These are brief, generalized statements in answer to the general and each of the specific sub-problems.
- These contain generalized in relation to the population. These are general inferences applicable to a wider and similar population.
- Flexibility is considered in making of conclusions. It is not a must to state conclusions on a one-to-one correspondence with the problems and the findings as all variables can be subsume in one paragraph
- Conclusions may be used as generalizations from a micro to a macro-level or vice versa (ZOOM LENS approach).

#### **Recommendations**

- They should be based on the findings and conclusion of the study.
- Recommendations may be specific or general or both. They may include suggestions

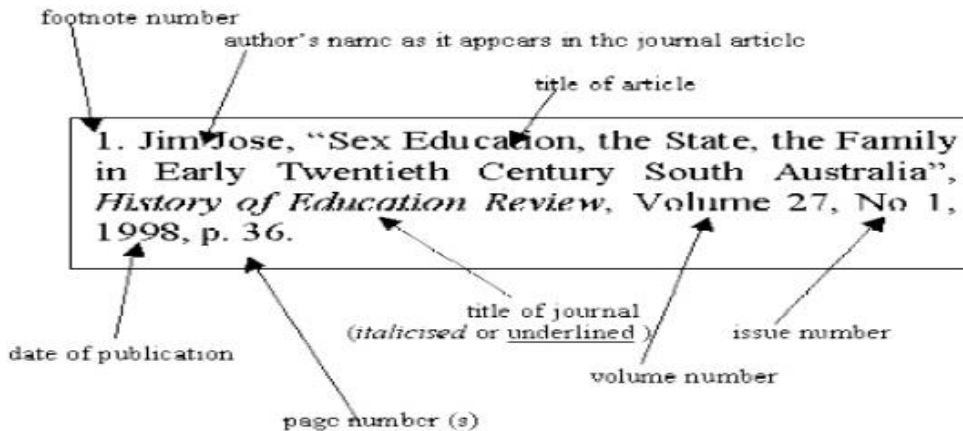
for further studies.

- They should be in non-technical language.
- They should be feasible, workable, flexible, doable, adaptable.

## **FOOT NOTES & BIBLIOGRAPHY**

### **FOOT NOTES**

- A footnote is a notation at the bottom of the page in a printed document.
- Footnotes are usually presented in smaller print than the dominant text, and they are used for a variety of purposes.
- The “foot” in “footnote” refers to the fact that the notation is located in the “footer” or “bottom” of the document.
- A similar concept is the endnote, a note which is provided at the end of a document, rather than at the bottom of a specific page.
- When a text has footnotes, they are indicated with various symbols or superscript numbers.
- The asterisk symbol, \*, is a common symbol for footnotes, but a variety of symbols including daggers, †, may be used.
- In a text with a lot of footnotes, numbers are usually used to indicate footnotes, so that the reader can keep track of what is going on.
- Endnotes are typically indicated with numbers, to make it easier for people to look them up.
- Different style manuals have different rules about using footnotes, and it is important to follow style guidelines when submitting material for publication
- Because footnoting can get very complicated, most style guidelines devote at least a few pages to the footnote.
- Some people avoid using footnotes at all, while others relish footnotes, because footnotes provide a great degree of freedom when they are used well



### **BIBLIOGRAPHY**

- A bibliography is a list of books, articles, and other sources you use when researching a topic and writing a paper.
- The bibliography will appear at the end of your paper.

- The bibliography is sometimes called Works Cited or Works Consulted.
- A bibliography is a summary of all your references in an alphabetical list (surnames first).
- Bibliography entries must be written in a very specific format, but that format will depend on the particular style of writing you use.
- Your teacher will tell you which style to use, and for most school papers these will be either MLA, APA, or Turabian style.

Bibliography entries will include:

- Author
- Title of your source
- Publication information
- Date

Your entries should be listed in alphabetical order.

### **Purpose of Bibliography**

- The main purpose of a bibliography entry is to give credit to other authors whose work you've consulted in your research.
- Another purpose of a bibliography is to make it easy for a curious reader to find the source you've used.
- Bibliography entries are usually written in a hanging indent style.
- This means that the first line of each citation is not indented, but subsequent lines of each citation are indented.

What is a hanging indent?

- A hanging indent is an APA guideline for formatting your reference page.
- The first line of your reference will line up with the left margin and each line after will be indented one-half inch from the left margin. It basically is opposite of a normal paragraph where you indent the first line. Here is an example:

#### References

Benac, N. (2010). First lady aims to trim American waist sizes. *CMAJ: Canadian Medical*

*Association Journal*, 182(9), 385-386. doi:10.1503/cmaj.109-3240

King, J. (2010, July 9). Summer shouldn't be a lazy time for kids. *USA Today*, sec. 9a. Retrieved

from <http://www.usatoday.com>

### **Styles of Bibliography:**

1. MLA (Modern Language Association)
2. APA (American Psychological Association)
3. Turabian style (Chicago Style for Students and Researcher)



**MLA** (Modern Language Association)

**Last name, first name**  
Eicher, David J. *The Longest Night: A Military History of the Civil War*. New York: Simon & Schuster, 2001. Print.

**Italicize the title of a book.**

**Indicate medium type (print or web).**

**APA** (American Psychological Association)

**author** Stephens, RL **publication date** (1992). **article title** Imagery: a treatment for nursing student anxiety. **journal title** *Journal of Nursing Education* **31**, pg. 314-320. Retrieved August 15, 2001, from CINAHL database.

**pages** **date viewed online** **database name** **volume**

**Turabian style**

**Book With One Author**

**In a Bibliography:**

Berlin, Ira. *Slaves Without Masters*. New York: Random House, 1974.

**In a Footnote:**

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<sup>3</sup>Ira Berlin, *Slaves Without Masters* (New York: Random House, 1974), 54.

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