

Research Aptitude

Research: A Research is the scientific and objective analysis as well as recording of controlled observations that contributes in the development of generalisations principles resulting in prediction and complete control of events. Scientific research is a systematic and objective attempt to give answers to various different questions. It is a crucial and essential tool that leads us towards the path of progress, A remarkable and symbolic research leads to progress in some area of life. Research takes birth because of curiosity in humans mind. Curiosity aroused to study movements, behaviour patterns and so on. We can elaborate research as “ideally, the careful unbiased investigation of a problem, based in so far as possible upon demonstrable facts and involving relevant distinctions, interpretations and generally some generalisations” Educational research is the study and investigation in the area of education or bearing upon educational problems. As research is an ongoing problem solving process, focuses and helps in integrating the objectives by analysis and comprehensive investigation

Characteristics of a good research

- 1. The main focus should always be in the direction of seeking a solution of specific problem.*
- 2. Research should be conducted on the basis of empirical or observable evidences.*
- 3. A brief observation and accurate description must be there in the research.*
- 4. More focus should be towards the development of theories, principles and generalisations, which proves very useful and accurate predictions will enhance the essence of a research.*
- 5. A good research must be systematic, objective and logical in nature.*

Types of Research-Definitions

- 1. Action research** is a methodology that clubs action and research to evaluate particular questions, issues or phenomena through observation and reflection, and deliberate intervention to enhance practice.
- 2. Applied research** is a research organise to solve practical problems rather than to attain knowledge merely for knowledge sake.
- 3. Basic research** is experimental and theoretical work undertaken to attain new knowledge without looking for long-term benefits other than the advancement of knowledge.
- 4. Time** is a crucial element of any research design. The most fundamental distinctions in research design nomenclature: Cross-sectional versus longitudinal studies. A cross-sectional study is one that takes place at a single point in time. In effect, we are taking a ‘slice’ or cross-section of whatever it is we're observing or measuring. A longitudinal study is one that takes place over time, we have atleast two or more waves of measurement in a longitudinal design.
- 5. A variable** is any entity that can take on different values. Anything that can vary can be considered a variable. For example, age can be considered a variable because age can take different values for different people or for the same person at different times. Similarly, country can be considered a variable because a person's country can be assigned a value.
- 6.** There is a distinction between an ***independent and dependent variable***. In fact the independent variable is what you manipulates--a treatment or program or cause. The dependent variable is what is affected by the independent variable--your effects or outcomes. For example, if you are studying the effects of a new educational program on student

achievement, the program is the independent variable and your measures of achievement are the dependent ones.

7. A **hypothesis** or an assumption is a particular statement of prediction. It elaborates in concrete rather than theoretical terms what you expect will happen in your study. Not all studies have hypotheses. Sometimes a study is exploratory.

8. **Qualitative research** is research that is generally performed to get insights regarding attitudes, beliefs, motivations and behaviours of individuals to explore a social or human problem and consist methods such as focus groups, in-depth interviews, observation research and case studies.

9. **Quantitative research** is research concerned with the measurement of attitudes, behaviours and perceptions and consists interviewing methods such as telephone, intercept and door-to-door interviews as well as self-completion methods such as mail outs and online surveys.

Three basic types of questions that research projects:

1. **Descriptive:** When a study is organised for the first time to elaborate what is going on or what exists. Public opinion polls that seek only to elaborate the proportion of people who hold different opinions are primarily descriptive in nature. For example, if we want to know what percent of the population would vote for a BJP or Congress in the next election, we are just interested in elaborating something.

2. **Relational:** When a study is designed to look at the relationships between two or more variables. A public opinion poll that compares what proportion of males and females say they would vote for a BJP or Congress candidate in the next election is crucially studying the relationship between gender and voting preference.

3. **Causal:** When a study is organised to find out whether one or more variables e. g. a program or treatment variable causes or affects one or more outcome variables. If we did a public opinion poll to try to find out whether a recent political advertising campaign changed voter preferences, we would essentially be studying whether the campaign (cause) changed the proportion of voters who would vote BJP or Congress (effect).

Thesis

Thesis and its format: It is the most basic fundamental format for thesis which is stated below. The entire list of the overall contents and chapter are almost similar for every subject of university. However, In various cases one or two heading may proves undesirable or sometimes only one or more headings may be needed. We can categorize the entire thesis into four parts:

1. Introduction.
2. Elaboration and discussion of topic.
3. Informartion regarding research & its applications.
4. Reference and appendices.

Paper

It will comprise of an essay or dissertation read at a seminar or published in a journal, Hence a formal written matter with the intention to publish, present, read loudly or a scholarly essay.

Article: An article is a non-fictional literacy that constitutes an individual independent part of a publication as of a newspaper or magazine.

Workshop: A meeting is said to be held when a group indulges into intended discussion on a specific topic or on a project.

Seminar: A conference is conducted for the discussion on training or on a specific topic.

Conference: A formal meeting for discussion or debate.

Symposium: A meeting or conference held for discussion on any specific topic, specifically where the candidates form the audience and deliver a presentation.

Dissertation or Thesis: Encouraging the new view points resulting from research; generally a need for advanced academic degree.

Plan of Chapters

Consider all the chapters and decide what is best for your research. Then make a list in point form of what will go in each chapter. Always represent the text of thesis in logical order. Make a relevant plan for each chapter and section, the result will be clearer and easier to read. The different headings are quoted below:

- 1. Copyright Waiver:** This gives the university library the right to publish your research work.
- 2. Declaration:** This page declares that the thesis is your own work and is not taken from any other's work.
- 3. Title Page:** The format of this page may be Title/Author: A thesis submitted for the degree of Doctor of Philosophy in faculty of science in university on date.
- 4. Abstract:** This part is most crucial part of the thesis it is most widely page. It is best written towards the end. It should be self contained and contains a concise description of the problems. Your method of solving, result and conclusion should be remarkable.
- 5. Acknowledgements:** It is like a thanks giving page to all the people, who had some kind of contribution in the research or whose work you used for your research.
- 6. Table of content:** Introduction starts from page 1, the earlier pages should have various numbering system.
- 7. Introduction:** This provide us information about the topic and its relevance. This should be interesting indeed. Never over estimate the reader's familiarity with the topic. Introduction must not be boring.
- 8. Literature Review:** Where did the problem exactly come from? what is already known about the problem? If you have been keeping up with the literature as you vowed to do three years ago, and if you have made notes about crucial papers over the year, then you have some good points for the review.
- 9. Materials and Methods:** Material and method changes from thesis to thesis and may be absent in theoretical thesis. It also elaborates the methods used for research.
- 10. Theory.**

11. Results and Discussion: The results and discussion are very-often combined in thesis. The division of results and Discussion material into chapters is generally best done as per the subject matter. In most cases your result calls for discussion. What do they exactly mean? How can they fit into existing body of knowledge? Are they consistent with present theories? Do they give new insights? Do they introduce new theories or mechanism?

12. Conclusion: It is basically abstract in nature and contains conclusion in very concise manner. A summary of conclusions may be put in point form after the result and discussion chapter. It is hence very brief.

13. Reference and Appendices.

14. Bibliography.

Sampling

The process of sampling includes selecting units e. g. people from the population of interest so that by studying the sample we may elaborate our results back to the population from which they were chosen. A response is a particular measurement value that a sampling unit supplies. If you measure the overall population and find out a value like a mean or average, it is called parameter of the population. The distribution of an infinite number of samples of the same size as the sample in your study is called sampling distribution.

In the terms of sampling, the standard error is called sampling error. Sampling error gives us some idea of the precision of our statistical estimate. A low sampling error means that we had relatively less variability or range in the sampling distribution. How do we calculate sampling error? on the standard deviation of our sample. The greater the sample standard deviation, the greater the standard error the sampling error. The standard error is also related to the sample size. The greater your sample size, the smaller the standard error.

Because the greater the sample size, the closer your sample is to the actual population itself. If you take a sample that consists of the entire population you actually have no sampling error as you don't have a sample, you have the entire population. The mean you estimate is the parameter.

Probability sampling method

Any method of sampling that uses some form of random selection such as picking a name out of a hat is known as probability sampling.

Simple random sampling is the simplest form sampling. Simple random sampling is simple to calculate and is very easy to explain to others. As simple random sampling is a fair way to select a sample, it is reasonable to fundamentalize the results from the sample back to the population.

Simple random sampling is not the most statistically effective method of sampling and you may, just because of the luck of the draw, not get outstanding representation of subgroups in a population.

Stratified Random Sampling, also known as proportional or quota random sampling, consists bifurcating your population into homogeneous subgroups and then choosing a simple random sample in each subgroup. It ensure that you will be able to represent not only the entire population, but also key subgroups of the population particularly small minority groups. Second, stratified random sampling will fundamentally have more statistical precision than simple random sampling. This is true only if the strata or groups are homogeneous in nature.

The major difficulty associate with the random sampling methods is when we have to sample a population that's disbursed around a huge geographic region is that you will have to cover a lot of ground geographically in order to get to each of the units you sampled. It is for precisely this problem that cluster or area random sampling was formed. In cluster sampling, we follow the steps stated below:

1. *divide population into clusters (Basically along geographic boundaries).*
2. *randomly sample clusters.*
3. *measure all units within sampled clusters.*

Non-probability sampling

Non-probability and probability sampling are very different, the difference is that non-probability sampling does not consist random selection and probability sampling does. We can divide nonprobability sampling methods into two broad types: Accidental or purposive. In accidental sampling, sample is chosen accidentally and we have no evidence that they are representative of the populations we're interested in fundamentalizing to and in many cases we would clearly suspect that they are not. e. g. College students in some psychological survey. In purposive sampling, we sample with a purpose in mind.

We fundamentally would have one or more particular definite groups we are looking for. For example, have you ever run into people in a mall or on the street who are carrying a clipboard and who are stopping various people and asking if they could interview them? Most likely they are conducting a purposive sample. Purposive sampling can be much desired for situations where you need to reach a targeted sample quickly and where sampling for proportionality is not the primary concern. With a purposive sample, you are likely to get the opinions of your target population, but you are also likely to overweight subgroups in your population that are more approachable.

Quota sampling:

Quota sampling is a purposive sampling, Where you choose people non-randomly according to some fixed quota. There are two types of quota sampling: Proportional and non proportional. In proportional quota sampling you want to represent the major features of the population by sampling a proportional amount of each. e. g. Choosing 40% females from a population of say 1000.

Snowball sampling. Snowball sampling includes identifying someone who meets the barometer for inclusion in your research study. You then ask them to recommend others who they may know who also fulfill the criteria.

Research Design

Research design acts like a glue that sustain the research project together. A design is used to structure the research, to show how all of the major parts of the research project the samples or groups, measures, treatments or programs and methods of assignment work together to try to address the central research questions. Design can be either experimental or non-experimental.

The last part of the research is data analysis. In most of the social researches, the data that is analyse comprises into three major steps, Which are stated below:

1. *Cleaning and organizing the data for analysis (Data Preparation).*
2. *Describing the data (Descriptive Statistics).*
3. *Testing Hypotheses and Models (Inferential Statistics).*

Data Preparation

It comprises checking or logging the data in; checking the relevancy of data; entering the data into the computer; transforming the data; and developing and documenting a database structure that integrates the various measures.

Types of Statistics

Descriptive Statistics are used to elaborate the fundamental features of the data in a study. They give simple summaries regarding the sample and the measures. Along with simple graphics analysis, they become the pillars of virtually quantitative analysis of data. With descriptive statistics you are merely describing what it is, what the data represents.

Inferential Statistics investigate questions, models and hypotheses. In many cases, the conclusions from inferential statistics extend beyond the immediate data alone. We use inferential statistics and try to refer from the sample data what the population thinks. We sometimes use inferential statistics to make judgments of the probability that an observed difference between groups is a dependable one or one that might have happened by chance in this study. Thus we use inferential statistics to make inferences from our data to more fundamental conditions; we use descriptive statistics simply to elaborate exactly is in our data.

Steps of Research

1. ***Identification of research:*** The 1st step of the research process is to figure out the subject and nature of the problem.
2. ***Proposal of Action:*** As soon as we find out the subject or the problem, we are supposed to set up an action plan to solve the problems or find a relevant solution for the same.
3. ***Constructing hypothesis:*** Hypothesis i.e.. Assumptions is a tentative explanation for an observation, phenomenon or scientific problem that can be tested by investigation. It is a concept that is not yet verified but that if true would explain various facts or phenomena.

Characteristics of hypothesis:

- (1) *It must mention the relationship between variables*
- (2). *It must comprise of known facts*
- (3). *it can be tested*

(4). *It must be dear in its concept*

(5). *It must be objective and specific*

(6). *It must be amendable to testing with in the rational time. So our next step is to construct a hypothesis for research and after that he plans to elaborate it either based on laboratory experiment or field experiment.*

4. Collection of data: The researcher must assimilates the data either in experimental way or in a nonexperimental way.

5. Presentation of data: This step pertains to the representation of the gathered data into a scientific manner, so that he or anyone else will be able to analyse that clearly. The most fundamental way for presentation of data in scientific or social research is to make a table of the assimilated data in a particular manner, which will reflects the relation between variables.

6. Analysis of data: The analysis can be performed in both the ways i.e.. Statistical and descriptive.

7. Declaration of Result: When analysing of the data is completed, the researcher will announce the research result.

Types of Research

There are various classifications of a research. Some of the crucial classifications are stated below:

1. Exploratory and conclusive research: Exploratory or formulate research aims at probing into phenomenon to formulate a more precise research problem or to develop a hypothesis. While conclusive research tests these hypothesis. Developed through exploratory research and may suggest a new idea or a new opportunity.

2. Fundamental or pure or basis research, applied research and action research: A fundamental research is the formal and systematic process where the researcher's aim is to. Develop a theory or a model by identifying all the crucial variables in the situation and by discovering broad generalisations and principles about these variables.

Applied research, applies the theory or model developed theories but to test those existing theories in actual problem situations. Action research has recently been popular in the field of social psychology, industrial psychology and education. In action research, researcher focuses upon the immediate consequences and applications of a problem of a theory or a model.

3. Historical research, descriptive research and experimental research: Historical research describes what was. The process involves investigation, recording, analyzing and interpreting the events of the past for the purpose of discovering generalizations that are helpful in understanding the past and the present and to a limited extent, in anticipating the future. Descriptive research describes records, analyzeS'and interprets the conditions that exist, practices that prevail, beliefs, points of views or attitudes that are held processes that are going in effects that are being felt, or trends that are developing.

It involves some type of comparison or contrast and attempts to discover relationship between existing non-manipulated variables. It can be of various types, like survey studies, interrelationship studies casual comparative studies and development studies. Experimental research describes what will be when certain variables are carefully controlled or manipulated. The focus is on variable relationship.

Deliberate manipulation is always a part of experimental method. Experimental research is the description and analysis of what will be, or what will occur, under carefully controlled conditions in which one factor is varied and the others are kept constant and can be repeated by another investigator, by the same investigator or another occasion with nearly identical results.

4. Experimental and non-experimental research: This classification is dependent on the nature of research. An experimental research is one where the independent variables can be directly manipulated by, experimenter. It is further divided into two main types-Laboratory experiment and field experiment. A non experimental research is one where independent variables cannot be manipulated and therefore cannot be experimentally studied. A non experimental research can be divided into three main types-field, studies, expost factor research and survey research.

5. Laboratory Experiment: It is the study of a problem in a situation in which some variables are manipulated and some are controlled in order to have an effect upon the dependent variable. The variables which are manipulated are known as independent variables and the variables which are controlled are known as extraneous or relevant variables. Thus in laboratory experiment the effect of manipulation of an independent variables upon the dependent variable is observed under controlled conditions.

6. Field Experiments: It is a study carried out is a more or less realistic situation or field where the experimenter successfully manipulates one or more independent variables under the maximum possible controlled conditions.

7. Field Study: It is a study which systematically discovers relations and interactions among variables in real life situations such as school, factory, community college etc. It field study the investigator depends upon the existing conditions of a field situation as well as upon the selection of subject for determining the relationship among variables.

8. Expost Facto Study: In this the investigators attempt to trace an effect which has already occurred to its probable causes. The effect becomes the dependent variable and the probable causes become the independent variable. The investigator has no direct control over such variables.

9. Survey Research: It is a technique where, the investigator or researcher studies the whole population with respect to certain sociological and psychological variables. Depending upon the ways of collecting data, survey research can be classified into different categories, namely, personal interview, main questionnaire, panel technique arid telephone survey.

Research Aptitude Study Notes on Thesis Writing

A. Meaning and Features: A thesis is a detailed knowledge and information about the research problem. It can also be called as a dissertation. In a research study, thesis writing is the final and most critical part. It is also considered to be the final requirement for an academic degree.

Some of the features and characteristics of a thesis are:

- A thesis is usually in the form of a very long detailed essay divided into chapters.
- It is an original piece of work based on **primary or secondary data**.
- Although every thesis is unique in content and intent, yet they share a few common elements.
- These elements can vary from one discipline to another and one institution to another. It is different from research papers, term papers and journal articles

B. Considerations for Thesis Writing

It is important to consider the following points before a researcher starts working on a thesis:

1. Structure and Style: A thesis should be well structured and organised. It should follow three basic principles- *unity, coherence and development*. That is, one needs to check whether the structure of the thesis has a logical flow. Unity goes hand in hand with coherence. A well-structured thesis its all the elements together in a convincing way.

2. Language and Tone: In a thesis, one is expected to demonstrate good grammar, formal academic tone, and thoughtful consideration about the topic. A well-presented thesis starts with good sentences. Each sentence should present a different idea. Do not make sentences look similar in meaning. One should also avoid using fancy words. It is good to say precisely what one means and avoid using superior's statements.

In terms of tenses, most **academic writing uses the present tense**.

Past tense is used to refer to only past events. Future tense may be used when one is giving a recommendation or presenting plans and events to happen with a high degree of certainty. Make sure the language and tone are consistent throughout the article.

3. Editing: Plan to prepare two full drafts. This allows you to see the errors by yourselves. Make your academic friends or fellow researchers read at least the introduction part to gather some constructive feedback. Also, set yourself a deadline for submission (before the actual one) because revisions can go on and on. Prepare a checklist for editing which answers these concerns:

- Does your argument remain the same and clear throughout the thesis?
- Is your tone appropriate?
- Have you presented contemporary knowledge about the topic or just relying on classical theories and concepts?
- Is your literature review helping to contextualise the topic for the readers?
- Does the introduction present the idea and plan of your thesis clearly?
- Maintaining this checklist will help you revise your thesis by yourself, time and again.

- A constant supervision is needed for the desired piece of research work.
- It is very important to consult your supervisor regularly about the structure, references, literature and so on.
- Indicate all the sections and sub-sections properly and be guided by an outline or plan.
- After small accomplishments, consult your supervisor timely and make prompt revisions.
- Keeping yourself on the toes helps you to synthesise your piece of writing into a coherent and well-articulated thesis.

C. Format of the Thesis

The format of a thesis is usually specified by the supervisor or the institution. Nonetheless, thesis writing will follow a general format consisting of the following elements:

1. **Title:** The title must give the sense of what you are examining. It must condense what you are doing and has to short (less than 15 words) but catchy.
2. **Acknowledgement:** This section should be present in the simplest way by acknowledging the contribution of supervisors, institution, fellow research scholars, friends and family.
3. **Table of contents:** Table of contents should give a sense of the organisation and logical arrangement of your work. Each chapter and section should be properly marked with page numbers.
4. **Introduction:** This is the most widely read section of a thesis. Therefore, it should be interesting, logical, short, to the point, **informative and complete**. An introduction gives a fair idea of whether your thesis has been well presented or not.
5. **Abstract:** Some thesis would have an abstract also, usually at the beginning of the chapters, introduction and conclusion. An abstract should provide a **good and clear summary** of your work. This is important because this will be the most widely read section if you ever think of getting your separate chapters published in journals.
6. **Methods:** Usually, there is a separate chapter dedicated to the **discussion on methods**. With regard to methods, you must provide a justification for the method you have used. Discuss alternative methods also and then justify why you chose one method over others and how the choice of this method is relevant to your topic.
7. **Literature Review:** This is another important element of a thesis and is also presented in a separate chapter. This part should highlight your knowledge of the existing literature. One should use recent debates to contextualise the topic and make sure that your debate or commentary fits in the larger topic. Show the outcomes of the other researchers' works. It is vital that you include concepts and ideas by experts in this section.

Psychological Association) style. However, it varies between the disciplines; make sure you know which format is being used in your department or college. Good referencing within chapters is important because it allows the readers to differentiate between the previous knowledge and your original idea, argument and thought.

Assemble the thesis/project report in this order:

1. Cover page: includes the title, author, degree (“Thesis/Project submitted in partial fulfillment of the requirements for the Degree of Ph.D. of ... in ...”), and date.
2. Cover page color: Pink
3. Thesis/Project Approval Form.
4. Plagiarism policy compliance statement.
5. Copyright page that grants MU the right to use and reproduce fully or partially the work being presented.
6. Dedication page (optional).
7. Acknowledgments page (optional).
8. Abstract: a concise summary of the essential information of the work being presented, namely of the study’s scope, purpose and results. The reference-free single spaced abstract should not exceed two pages.
9. Table of Contents: includes all the subsections of each chapter and the list of appendices (if applicable) and page numbers.
10. List of Figures: includes figure number, caption, and the page number.
11. List of Tables: includes table number, caption, and the page number.
12. Abbreviations page: lists all the abbreviations used in the text alongside their fully written unabbreviated form.
13. Thesis/Project text; the layout is described in the next section.

Layout

The following presents a framework for a thesis. The information is offered as a general guideline.

Students should always consult their advisor for additional guidelines.

In particular, the layout of project reports can be different depending on the type and scope of the project.

Note that each chapter should start on a new page.

- Introduction: background; statement of the problem; definition of terms; purpose of the study; theoretical basis; contributions of the study; organization of the remainder of the study.
- Literature Review: chronological, categorical or related theoretical view points related to topic. Proposed Solution/Methodology: research design or approach (quantitative, qualitative or algorithmic); population and / or sample; collection and tabulation of data; and data analysis procedures.
- Solution Validation, Analysis of the Data, Results, and Discussion: presentation and discussion of the findings, including limitations.
- Conclusions, Recommendations: summarizes the entire research effort; addresses the initial purpose of the study (stated in the introduction); stresses the importance of the work accomplished; leaves a final impression on the reader. It can also include suggestions for further work.
- Bibliography/References: references should acknowledge any work done by someone other than the author. The reference should also include work performed by the author

if presented or published at an earlier date. References should adopt one of the standard international styles; the American Psychological Association style for references and citation is recommended. For more information, contact the library.

- Appendices: material too detailed or lengthy for inclusion in the body of the study (e.g. questionnaires, maps). Appendices may also contain information that might clarify the thesis but is routine in nature or indirectly related to the thesis. Raw data and examples of calculation could be incorporated.

Style and form

- Paper: Use high-quality acid-free A4-size paper, with only one side of the paper.
- Printing: A high-quality laser printer should be used for the final copy. Headings: In disciplines where section numbering is normally used, the following guidelines apply:
- Chapter title: 18 – 24 pt size, bold. Main Section Headings: can be numbered as chapter-number. Section-number (e.g., 3.2 for chapter 3, section 2) in 14 pt size, bold. Second Headings: can be numbered as x.y.z (e.g., 3.2.4 for chapter 3, section 2, and subsection 4) in 12 pt size, bold. First Subheadings: can be numbered as w.x.y.z (e.g., 3.2.4.1 for chapter 3, section 2, subsection 4, and sub-subsection 1) in 12 pt size, regular. Second Subheadings: preferably unnumbered, 12 pt, italics.
- Text Font: Acceptable fonts generated by word processing programs include, but are not restricted to: Times Roman 12, Helvetica 12, and Letter Gothic 12. The font provided through LaTeX is acceptable. Bold and italics should not be used excessively in the text. Furthermore, colored text should not be used.
- Spacing: Double or one and a half spacing is required for the text. Only footnotes, long quotations, bibliography entries (double space between entries), table captions, and similar special material may be single spaced.
- Margins: Left, 4 cm; top, bottom, and right, 2.5 cm. These are necessary to allow for binding and trimming.
- Page Numbering: Preliminary pages of the thesis, that is, those preceding the text are to be numbered in Roman numerals. The _rst page must not show its page number. Pages of the text itself and of all items following the text should be numbered consecutively throughout in Arabic numbers, beginning with number 1 on the _rst page of the _rst chapter. Page numbers should be placed in the lower right corner or center of the page. Only the number should appear, not page 9.
- Tables and Figures: Figures and tables should be inserted at the appropriate place in the text. Figures must have numbers and captions under the _gures. Tables have their titles and numbers above.
- Drawings: Any material which cannot be typed or computer generated should be drawn with permanent black ink in neat and heavy lines. Photographs of drawings are acceptable. Xerox reproductions of drawings are acceptable if they are of high contrast
- Photographs: Mount small photographs with glue. Do not use rubber cement or tape. High clarity Xerox copies of photographs are also acceptable. However, highquality scanned e-images can also be inserted into the thesis text.

- Footnotes: In disciplines where footnotes are normally used, they should appear at the bottom of the same page as their reference. Footnotes should be numbered in Arabic numerals. The footnote reference is superscripted and the explanation at the bottom of the page begins with the footnote reference number. Footnotes should have a smaller font size than the text (e.g. 10 pt).
- CDs and DVDs: identify with title, name of student, and date.
- Computer Software: Describe in separate section in prefatory pages (e.g., list of figures and tables). If applicable, state requirements for the use of the software (e.g., hardware, screen resolution type) and any other information necessary for proper viewing of the software.
- Oversized Material: Oversize foldout pages may be included, though ample margins for binding must be included. Leave oversize page unfolded. The bindery will fold and insert them. All pages must appropriately numbered if found in the text.
- Binding: Binding will be arranged by the library, for a fee, in order to ensure consistency. At least two copies of the thesis should be submitted to the library of the campus concerned.

LAYOUT/FORMAT OF A RESEARCH REPORT / PhD THESIS / M.PHIL. DISSERTATION

The various frameworks can be used depending on the content of the report, but generally, the same rules apply. Introduction, method, results and discussion with references or bibliography at the end and an abstract at the beginning could form the framework.

But the most used and followed report structure is are as follow:

- TITLE PAGE- Title of project, Subtitle (where appropriate), Date, Author, Organization, Logo
- BACKGROUND:- History(if any) behind the project
- ACKNOWLEDGEMENT:- Author thanks people and organization who helped during the project
- SUMMARY (sometimes called abstract of the synopsis):- A condensed version of a report – outlines salient points, emphasizes main conclusions and (where appropriate) the main recommendations. N.B this is often difficult to write and it is suggested that you write it last.
- LIST OF CONTENTS: - An at- a – glance list that tells the reader what is in the report and what page number(s) to find it on.
- LIST OF TABLES: - As above, specifically for tables.
- LIST OF APPENDICES:- As above, specifically for appendices.
- INTRODUCTION:- Author sets the scene and states his/ her intentions.
- AIMS AND OBJECTIVES AIMS:- – general aims of the audit/ project, broad statement of intent.
- OBJECTIVES:- specific things expected to do/deliver(e.g. expected outcomes)
- METHOD:- Work steps; what was done – how, by whom, when?

- **RESULT/FINDINGS:-** Honest presentation of the findings, whether these were as expected or not. Give the facts, including any inconsistencies or difficulties encountered
- **DISCUSSION:-** Explanation of the results.(you might like to keep the SWOT analysis in mind and think about your project's strengths, weakness, opportunities and threats, as you write)
- **CONCLUSIONS:-** The author links the results/ findings with the points made in the introduction and strives to reach clear, simply stated and unbiased conclusions. Make sure they are fully supported by evidence and arguments of the main body of your audit/project.
- **RECOMMENDATIONS:-** The author states what specific actions should be taken, by whom and why. They must always be linked to the future and should always be realistic. Don't make them unless asked to.
- **REFERENCES:-** A section of a report, which provides full details of publications mentioned in the text, or from which extracts have been quoted.
- **APPENDIX:-** The purpose of an appendix is to supplement the information contained in the main body of the report.

Few Other Important Terms & Terminology

Overview of the framework of report

There are at least 3 distinct report writing styles that can be applied by students of Business Studies. They are called:

Conservative Style

Essentially, the conservative approach takes the best structural elements from essay writing and integrates these with appropriate report writing tools. Thus, headings are used to deliberate upon different sections of the answer. In addition, the space is well utilized by ensuring that each paragraph is distinct (perhaps separated from other paragraphs by leaving two blank lines in between).

Key Point Style

This style utilizes all of the report writing tools and is thus more overtly 'report-looking'. Use of headings, underlining, margins, diagrams and tables are common. Occasionally reporting might even use indentation and dot points. The important thing to remember is that the tools should be applied in a way that adds to the report. The question must be addressed and the tools applied should assist in doing that. An advantage of this style is the enormous amount of information that can be delivered relatively quickly.

Holistic Style

The most complex and unusual of the styles, holistic report writing aims to answer the question from a thematic and integrative perspective. This style of report writing requires the researcher to have a strong understanding of the course and is able to see which outcomes are being targeted by the question.

APA Citation Style

APA stands for American Psychological Association, the scientific organisation that assembles the publishing manual of the APA format. The style was developed in 1929 by a group of scientists to standardize scientific writing. It was created in the hopes that it would provide a coherent and professional manner of citing sources

Citing a book in print

APA format structure: Author, A. (Year of Publication). Title of work. Publisher City, State: Publisher. APA format example: Finney, J. (1970). Time and again. New York, NY: Simon and Schuster.

Notes: When citing a book in APA, keep in mind: Capitalize the first letter of the first word of the title and any subtitles, as well as the first letter of any proper nouns.

The full title of the book, including any subtitles, should be stated and italicized.

Citing a general website article with an author

APA format structure: Author, A. (Year, Month Date of Publication). Article title. Retrieved from URL APA format example: Simmons, B. (2015, January 9).

Citing a general website article without an author

APA format structure: Article title. (Year, Month Date of Publication). Retrieved from URL APA format example: Teen posed as doctor at West Palm Beach hospital: police. (2015, January 16).

Shodhganga & ShodhGangotri

The Shodhganga@INFLIBNET Centre provides a platform for research students to deposit their Ph.D. theses and make it available to the entire scholarly community in open access.

The UGC Notification (Minimum Standards & Procedure for Award of M.Phil. / Ph.D Degree, Regulation, 2016) dated 5th May 2016 mandates submission of electronic version of theses and dissertations by the researchers in universities with an aim to facilitate open access to Indian theses and dissertations to the academic community world-wide.

Online availability of electronic theses through centrally-maintained digital repositories, not only ensure easy access and archiving of Indian doctoral theses but will also help in raising the standard and quality of research.

This would overcome serious problem of duplication of research and poor quality resulting from the “poor visibility” and the “unseen” factor in research output. As per the Regulation, the responsibility of hosting, maintaining and making the digital repository of Indian Electronic Theses and Dissertation (called “Shodhganga”), accessible to all institutions and universities, is assigned to the INFLIBNET Centre.

The Shodhganga@INFLIBNET is set-up using an open source digital repository software called DSpace developed by MIT (Massachusetts Institute of Technology) in partnership between Hewlett- Packard (HP).

The word “Shodh” originates from Sanskrit and stands for “research and discovery”. “Gangotri” is one of the largest glacier in the Himalayas and source of origination of Ganges, the holiest, longest and largest of rivers in India. The Ganges is the symbol of age-long culture, civilization, ever-aging, ever-flowing, everloving and loved by its people.

Under the initiative called “ShodhGangotri”, research scholars / research supervisors in universities are requested to deposit electronic version of approved synopsis submitted by research scholars to the universities for registering themselves for the Ph.D programme. The repository on one hand, would reveal the trends and directions of research being conducted in Indian universities, on the other hand it would avoid duplication of research.

Synopsis in “ShodhGangotri” would later be mapped to full-text theses in “ShodhGanga”. As such, once the full-text thesis is submitted for a synopsis, a link to the full-text theses would be provided from ShodhGangotri to “ShodhGanga”

Research Process

Dissertation markers expect the explanation of research process to be included in Methodology chapter. A typical research process comprises the following stages:

1. Selecting the research area. You are expected to state that you have selected the research area due to professional and personal interests in the area and this statement must be true. The importance of this first stage in the research process is often underestimated by many students. If you find research area and research problem that is genuinely interesting to you it is for sure that the whole process of writing your dissertation will be much easier. Therefore, it is never too early to start thinking about the research area for your dissertation.

2. Formulating research aim, objectives and research questions

Or developing hypotheses. The choice between the formulation of research questions and the development of hypotheses depends on your research approach as it is discussed further below in more details. Appropriate research aims and objectives or hypotheses usually result from several attempts and revisions and these need to be mentioned in Methodology chapter. It is critically important to get your research questions or hypotheses confirmed by your supervisor before moving forward with the work.

3. Conducting the literature review. Literature review is usually the longest stage in the research process. Actually, the literature review starts even before the formulation of research aims and objective; because you have to check if exactly the same research problem has been addressed before. Nevertheless, the main part of the literature review is conducted after the formulation of research aim and objectives. You have to use a wide range of secondary data sources such as books, newspapers, magazines, journals, online articles etc.

4. Selecting methods of data collection. Data collection method(s) need to be selected on the basis of critically analyzing advantages and disadvantages associated with several alternative data collection methods. In studies involving primary data collection, in-depth discussions of advantages and disadvantages of selected primary data collection method(s) need to be included in methodology.

5. Collecting the primary data. Primary data collection needs to be preceded by a great level of preparation and pilot data collection may be required in case of questionnaires. Primary data collection is not a compulsory stage for all dissertations and you will skip this stage if you are conducting a desk-based research.

6. Data analysis. Analysis of data plays an important role in the achievement of research aim and objectives. Data analysis methods vary between secondary and primary studies, as well as, between qualitative and quantitative studies.

7. Reaching conclusions. Conclusions relate to the level of achievement of research aims and objectives. In this final part of your dissertation you will have to justify why you think that research aims and objectives have been achieved. Conclusions also need to cover research limitations and suggestions for future research.

8. Completing the research. Following all of the stages described above, and organizing separate chapters into one file leads to the completion of the first draft. The first draft of your dissertation needs to be prepared at least one month before the submission deadline. This is because you will need to have sufficient amount of time to address feedback of your supervisor.

Scientific research involves a systematic process that focuses on being objective and gathering a multitude of information for analysis so that the researcher can come to a conclusion. This process is used in all research and evaluation projects, regardless of the research method (scientific method of inquiry, evaluation research, or action research). The process focuses on testing hunches or ideas in a park and recreation setting through a systematic process. In this process, the study is documented in such a way that another individual can conduct the same study again.

This is referred to as replicating the study. Any research done without documenting the study so that others can review the process and results is not an investigation using the scientific research process. The scientific research process is a multiple-step process where the steps are interlinked with the other steps in the process. If changes are made in one step of the process, the researcher must review all the other steps to ensure that the changes are reflected throughout the process. Parks and recreation professionals are often involved in conducting research or evaluation projects within the agency.

These professionals need to understand the eight steps of the research process as they apply to conducting a study.

Step 1: Identify the Problem

The first step in the process is to identify a problem or develop a research question. The research problem may be something the agency identifies as a problem, some knowledge or information that is needed by the agency, or the desire to identify a recreation trend nationally. In the example in table 2.4, the problem that the agency has identified is childhood obesity, which is a local problem and concern within the community. This serves as the focus of the study.

Step 2: Review the Literature

Now that the problem has been identified, the researcher must learn more about the topic under investigation. To do this, the researcher must review the literature related to the research problem. This step provides foundational knowledge about the problem area. The review of literature also educates the researcher about what studies have been conducted in the past, how these studies were conducted, and the conclusions in the problem area. In the obesity study, the review of literature enables the programmer to discover horrifying statistics

related to the long-term effects of childhood obesity in terms of health issues, death rates, and projected medical costs. In addition, the programmer finds several articles and information from the Centers for Disease Control and Prevention that describe the benefits of walking 10,000 steps a day.

The information discovered during this step helps the programmer fully understand the magnitude of the problem, recognize the future consequences of obesity, and identify a strategy to combat obesity (i.e. walking).

Step 3: Clarify the Problem

Many times the initial problem identified in the first step of the process is too large or broad in scope. In step 3 of the process, the researcher clarifies the problem and narrows the scope of the study. This can only be done after the literature has been reviewed. The knowledge gained through the review of literature guides the researcher in clarifying and narrowing the research project. In the example, the programmer has identified childhood obesity as the problem and the purpose of the study. This topic is very broad and could be studied based on genetics, family environment, diet, exercise, self-confidence, leisure activities, or health issues. All of these areas cannot be investigated in a single study; therefore, the problem and purpose of the study must be more clearly defined. The programmer has decided that the purpose of the study is to determine if walking 10,000 steps a day for three days a week will improve the individual's health. This purpose is more narrowly focused and researchable than the original problem.

Step 4: Clearly Define Terms and Concepts

Terms and concepts are words or phrases used in the purpose statement of the study or the description of the study. These items need to be specifically defined as they apply to the study. Terms or concepts often have different definitions depending on who is reading the study. To minimize confusion about what the terms and phrases mean, the researcher must specifically define them for the study. In the obesity study, the concept of “individual's health” can be defined in hundreds of ways, such as physical, mental, emotional, or spiritual health. For this study, the individual's health is defined as physical health. The concept of physical health may also be defined and measured in many ways. In this case, the programmer decides to more narrowly define “individual health” to refer to the areas of weight, percentage of body fat, and cholesterol. By defining the terms or concepts more narrowly, the scope of the study is more manageable for the programmer, making it easier to collect the necessary data for the study. This also makes the concepts more understandable to the reader.

Step 5: Define the Population

Research projects can focus on a specific group of people, facilities, park development, employee evaluations, programs, financial status, marketing efforts, or the integration of technology into the operations.

For example, if a researcher wants to examine a specific group of people in the community, the study could examine a specific age group, males or females, people living in a specific geographic area, or a specific ethnic group. Literally thousands of options are available to the researcher to specifically identify the group to study. The research problem and the purpose of the study assist the researcher in identifying the group to involve in the study. In research terms, the group to involve in the study is always called the population.

Defining the population assists the researcher in several ways. First, it narrows the scope of the study from a very large population to one that is manageable. Second, the population identifies the group that the researcher's efforts will be focused on within the study. This helps ensure that the researcher stays on the right path during the study. Finally, by defining the population, the researcher identifies the group that the results will apply to at the conclusion of the study. In the example in table 2.4, the programmer has identified the population of the study as children ages 10 to 12 years. This narrower population makes the study more manageable in terms of time and resources.

Step 6: Develop the Instrumentation Plan

The plan for the study is referred to as the instrumentation plan. The instrumentation plan serves as the road map for the entire study, specifying who will participate in the study; how, when, and where data will be collected; and the content of the program. This plan is composed of numerous decisions and considerations that are addressed in chapter 8 of this text. In the obesity study, the researcher has decided to have the children participate in a walking program for six months. The group of participants is called the sample, which is a smaller group selected from the population specified for the study. The study cannot possibly include every 10- to 12-year-old child in the community, so a smaller group is used to represent the population. The researcher develops the plan for the walking program, indicating what data will be collected, when and how the data will be collected, who will collect the data, and how the data will be analyzed. The instrumentation plan specifies all the steps that must be completed for the study. This ensures that the programmer has carefully thought through all these decisions and that she provides a step-by-step plan to be followed in the study.

Step 7: Collect Data

Once the instrumentation plan is completed, the actual study begins with the collection of data. The collection of data is a critical step in providing the information needed to answer the research question. Every study includes the collection of some type of data—whether it is from the literature or from subjects—to answer the research question. Data can be collected in the form of words on a survey, with a questionnaire, through observations, or from the literature. In the obesity study, the programmers will be collecting data on the defined variables: weight, percentage of body fat, cholesterol levels, and the number of days the person walked a total of 10,000 steps during the class.

The researcher collects these data at the first session and at the last session of the program. These two sets of data are necessary to determine the effect of the walking program on weight, body fat, and cholesterol level. Once the data are collected on the variables, the researcher is ready to move to the final step of the process, which is the data analysis.

Step 8: Analyze the Data

All the time, effort, and resources dedicated to steps 1 through 7 of the research process culminate in this final step. The researcher finally has data to analyze so that the research question can be answered. In the instrumentation plan, the researcher specified how the data will be analyzed. The researcher now analyzes the data according to the plan. The results of this analysis are then reviewed and summarized in a manner directly related to the research questions. In the obesity study, the researcher compares the measurements of weight, percentage of body fat, and cholesterol that were taken at the first meeting of the subjects to the measurements of the same variables at the final program session. These two sets of data

will be analyzed to determine if there was a difference between the first measurement and the second measurement for each individual in the program. Then, the data will be analyzed to determine if the differences are statistically significant. If the differences are statistically significant, the study validates the theory that was the focus of the study. The results of the study also provide valuable information about one strategy to combat childhood obesity in the community.

As you have probably concluded, conducting studies using the eight steps of the scientific research process requires you to dedicate time and effort to the planning process. You cannot conduct a study using the scientific research process when time is limited or the study is done at the last minute. Researchers who do this conduct studies that result in either false conclusions or conclusions that are not of any value to the organization.

This is an excerpt from Applied Research and Evaluation Methods in Recreation

Research Ethics Challenges & Road Ahead

Introduction

Maintenance of standards in teaching and research field is the core responsibility of UGC. In this connection, UGC consults with various experts and panels to ensure Quality Research. A number of research articles published in the reputed journals are one of the globally accepted criteria to judge quality, not only this published journals are considered for various academic purposes such as Institute Ranking, Appointment, promotion of Faculty members, Award of Research Degree.

However, the credibility of research publication is in 'Question for years' as it presents Institution Image & Nation Reputation. In recent few years' problems of dubious/sub-standard journals has become serious concern all over the world and the percentage of the research article published in such poor quality journals are much higher than others by Indian university and students.

The government of India has been uninterruptedly increased funding for conducting quality research but unfortunately, none of our university/institutions come under the list of top 100 university/institutions at the world level. Government of India had started several fellowship Net fellowship, Junior Research Fellowship (JRF-SRF), Mulana Azad National Fellowship, Rajeev Gandhi National Fellowship, Indian Council for Social Science Research (ICSSR) fellowship, Grant Commission (UGC) Research Award, Indian Council of Historical Research Doctoral Fellowship (PDF) for Women, and minor and major research project grant etc. to attract the younger generation to make their carrier in the research field and to promote the quality research in the higher education system.

So far the guidelines provided by the various Universities in term of advisable for all academic members while performing research has not resulted in a good outcome and better practice of research ethics.

There are various reasons behind the low standard of research in various study _elds, but the most important reason is related to the ethics of research. These ethical issues are not a new thing it was raised by 'Plato' twenty-four hundred years ago.

Recently UGC-approved list of journals was created to ensure published papers are of high standard along with an intention to perform research in an ethical way. The guidelines apply in many possible contexts including teaching, conducting research, paper publication or misconduct along with disciplinary procedures.

If the research is not conducted in an ethical manner the 'Outcome' will be irrelevant.

What Is Research Ethics

General Ethical Issues

Research Ethics is a set of guidelines that help researchers to conduct research successfully. The major principals revolve around the research process, data collection, and interpretation of data, report publication, thesis, confidentiality, obfuscation and plagiarism.

The ethics are closely related to the moral and value, it explains norms for conduct that distinguish between 'what is wrong' & 'what is right'.

It fosters a research culture that adheres to 'relevant legislation governing the protection of the dignity, rights, safety and privacy of those involved in research;' 'provide clear and easily accessible guidance on best ethical practice and regulatory requirements'; 'offer support and training to staff and students and any others

The Policy document contains not just the items that constitute ethical research but also lays out the 'Ethical Review Process' and the role of the University Research Ethics Committee.

In fields of medical science, while conducting biomedical and health research, the four basic ethical principles namely; respect for persons (autonomy), beneficence, non-maleficence and justice have been enunciated for protecting the dignity, rights, safety and well-being of research participants.

The researcher and the team are responsible for protecting the dignity, rights, safety and well-being of the participants enrolled in the study. They should have the appropriate qualifications and competence in research methodology and should be aware of and comply with the scientific, medical, ethical, legal and social requirements of the research proposal.

The ECs are responsible for ensuring that the research is conducted in accordance with the aforementioned principles.

General Ethical Issues

Ethical issues can surface any time during research activity, it may be due to participants, researcher or the organization supporting the research process. The role of 'EC (Ethical Committee)' plays an important role to ensure proper policy in place to answer below issues

– These are broadly divided into three areas due to –

Ethical issues related to the research process

Ethical issues related to participant or researcher

Ethical issues related to sponsoring institution

Benefit-risk assessment-

Benefits to the individual, community or society refer to any sort of favourable outcome of the research, whether direct or indirect. The social and scientific value of research should justify the risk, which is the probability of causing discomfort or harm anticipated as physical, psychological, social, economic or legal.

The researcher, sponsor and EC should attempt to maximize benefits and minimize risks to participants so that risks are balanced to lead to potential benefits at the individual, societal and or community levels.

The EC should assess the inherent benefits and risks, ensure a favourable balance of benefits and risks, evaluate plans for minimizing the risk and discomfort and decide on the merit of the research before approving it.

Informed consent process-

Informed consent protects the individual's autonomy to freely choose whether or not to participate in the research. The process involves three components – providing relevant information to potential participants, ensuring the information is comprehended by them and assuring voluntariness of participation.

This is more related in the fields of medical science and health research involving human participants, it is the primary responsibility of the researcher to obtain the written, informed consent of the prospective participant

Privacy and confidentiality-

Privacy is the right of an individual to control or influence the information that can be collected and stored and by whom and to whom that information may be disclosed or shared. The researcher should safeguard the confidentiality of research related data of participants and the community.

Conflict of interest Conflict of interest (COI) is a set of conditions where professional judgement concerning a primary interest such as participant's welfare or the validity of research tends to be unduly influenced by a secondary interest, financial or non-financial (personal, academic or political).

Research institutions must develop and implement policies and procedures to identify, mitigate conflicts of interest and educate their staff about such conflicts & Researchers must ensure that the documents submitted to the EC include disclosure of interests that may affect the research.

Data acquisition, management, sharing and ownership-

There is no single best way to collect data. Different collection techniques are needed for different types of research. Researchers should be sensitive to participants and use best practices for data collection

Ownership issues and responsibilities need to be carefully worked out well before data are collected and researchers should ensure clarity about data ownership, publication rights and obligations following data collection.

MoUs vetted by the institution and/or EC should be in place.

Researchers are responsible for knowing when permission is needed to collect or use specific data in their research.

Data protection and storage is important and once collected, data must be properly protected, as it may be needed at a later stage to confirm research findings, establish priority, or be re-analyzed by other researchers.

Responsible data handling begins with proper storage and protection from accidental damage, loss or theft. Care should be taken to reduce the risk of fire, flood and other catastrophic events. Computer files should be backed-up and the back-up data saved in a secure place at a site that is different from the original data storage site.

Data should be shared or placed in a public domain in a de-identified/anonymized form unless required otherwise, for which applicable permissions/re-consent should be sought unless obtained beforehand.

Payment for participation-

Research participants who suffer direct physical, psychological, social, legal or economic harm as a result of their participation are entitled, after due assessment, to financial or other assistance to compensate them

Research Report & Reviewing –

The value and benefits of research are dependent on the integrity of the researchers.

The responsible conduct of research (RCR) involves the following major components: values; policies; planning and conducting research; reviewing and reporting research; and responsible authorship and publication.

Research that is completed, irrespective of results, must be published since it would be unethical to expose another set of participant/patients/volunteers to the same risks to obtain the same results.

Avoid bias in the research process as it is considered as unethical to deliberate attempt to either hide facts or to under-represent or over-represent the truth.

Responsible authorship and publication-

Authorship should never be gifted and ‘ghost’ authors are not the authorship of research should be considered at the time of its initiation.

The authorship of scientific publications is a very important issue since it is the way in which scientists receive credit for their contributions. All listed authors of a publication should have contributed significantly to it. It is inappropriate to offer “guest authorship” to anyone who has not made any significant contribution. Likewise, it is wrong to exclude from authorship anyone who deserves to be an author.

Responsible use of Funds-

The management of research funds requires adherence to EC policies and regulations as well as policies of other funding agencies. This is applicable to both funds received from the institute and from external granting agencies. Efforts should be made to ensure reasonable and efficient use of resources following transparent and fair processes.

Research misconduct and policies for handling misconduct-

Research misconduct means fabrication, falsification or plagiarism (FFP) in proposing, performing or reviewing research or in reporting research.

The fabrication is making up data or results and recording or reporting them without visiting the field area.

The falsification is manipulation research materials equipment or processes or changing or omitting data or result such that the research is not accurately represented in Thee plagiarism is the appropriation of another person's idea, processes result or words without giving due credit. Another type of plagiarism is self-plagiarism when copying or reuse of one's own research but both type of plagiarism is considered to be an unacceptable practice

The Obfuscation is the obscuring research finding by the reporting style by the researchers if the researcher is not highlighting the results that are important or those that he does not fitting with his ideology.

Research Review, SOP & Ethics committee-

Ethics committee should operate and define a well-structured SOP for the review process and other task research-oriented tasks.

The Key Term plagiarism

The Oxford Dictionary defines plagiarism as “the practice of taking someone else's work or ideas and passing them off as one's own”. In the context of scientific research, it can involve unattributed lifting of textual material or scientific ideas or actual research results. The most extreme example would be a deliberate attempt to pass off someone else's entire research project as one's own. However, it can also involve (deliberate or unintentional) incorporation of some ideas or results of other researchers, without proper attribution, within one's own research publication.

Though the degree of severity can vary, plagiarism always amounts to ethical misconduct and requires redressal. The use of someone else's work in one's own is not by itself unethical. A limited amount of textual material in someone else's paper can be copied if it is clearly marked as a quote (typically by enclosing it within quotation marks) and the source is explicitly cited where the quote starts or ends. Alternatively, text may be paraphrased with a general indication of where the concepts originated.

Occasional reordering or substituting of words is not sufficient to count as paraphrasing: the recommended procedure is to read and understand the source material, then put it away and express the idea in one's own words.

Besides textual material, the incorporation of ideas, figures, graphs etc from other sources in a manner that conveys a false impression that they are original amounts to plagiarism.

Taking one's own published results and reproducing them in another work as if they were new is “self-plagiarism”.

“Duplicate publication” –submitting the same research results to two or more journals and treating them as separate publications –is also a form of self-plagiarism and must be avoided.

Plagiarism is an issue not only for scientific publications but also internal reports, textbooks, monographs and grant proposals

Recent Development & Changes by UGC

The UGC has prepared the Approved List of Journals that would be considered for the purpose of Career Advancement Scheme (CAS) and Direct Recruitment of Teachers and other academic staff as required under the UGC (Minimum Qualifications for Appointment of Teachers and other Academic Staff in Universities and Colleges) Regulation, 2016.

In the face of the mounting problem of quality vs quantity and the numerical evaluation becoming predominant, the UGC started its firefighting measures: it asked universities and other research institutions under it to compile lists of acceptable journals for every discipline which it then collated and put up on its website

Insisted on a plagiarism check being done on all dissertations using the Urkund software (made available to all research supervisors) before they were to be certified as ready for submission, and made it mandatory for all PhD dissertations to be institutionally uploaded onto the Inflibnet site.

Credibility of Research Publications is extremely important because it has a direct impact upon the individual, institutional and National image. With an aim to re_ine and strengthen the University Grants Commission (UGC) approved a list of journals, the UGC has issued a Public Notice dated 28th November 2018, and decided to establish a Consortium for Academic and Research Ethics (CARE).

The good quality Research Journals in disciplines under Social Sciences, Humanities, Languages, Arts, Culture, Indian Knowledge Systems etc., will be maintained by CARE and referred to as 'CARE Reference List of Quality Journals'.

A Consortium For Academic Research Ethics (CARE) has been established to re_ine and strengthen the UGC-approved list of journals by creating and maintaining 'Reference List of Quality Journals' for disciplines like Humanities, Social Sciences, Language, Arts, Culture, Indian Knowledge System etc.

The first CARE list is expected to be published before March 31, 2019 which will replace the existing UGC-approved list of journals.

This will be used for all academic purposes. The 'CARE Reference List of Quality Journals' will be regularly updated and published by the UGC and the Members of the Consortium at their respective

UGC's vice-chairman would be chairman of CARE and its members would include representatives of government and government-recognized institutions working in the _elds of social sciences, humanities, arts, science, medicine, agriculture, and engineering. In addition, the Association of Indian Universities would also get representation in CARE, besides INFLIBNET (Information and Library Network).

TYPES OF RESEARCH AND METHODS OF RESEARCH

The types of research differ mostly on three dimensions:

- 1) the nature of the question asked;
- 2) the method used to answer it; and
- 3) the degree of precision the method brings to answering the questions.

One way in which these methods do not necessarily differ, however is in the content or the focus of the research. In other words, if you are interested in the effects of television viewing in children, your research can be non-experimental, wherein you survey watching habits. If experimental, you may expose children models to the TV and one group non viewing of TV and look at the effect of the exposure on their behaviour.

The most general way of classifying research is to divide it into fundamental or pure or basic research and applied research. A fundamental research is the formal and systematic process where the researcher aims to develop a theory or a model by identifying all the important variables in a situation and by discovering broad generalisations and principles about those variables. It utilizes a careful sample so that its conclusion can be generalized beyond the immediate situation. For example biological psychologists explore the links between brain and mind; developmental psychology studies our changing abilities from womb to tomb and the personality psychologists investigate our inner traits.

Applied research, as its name implies, applies the theory or model developed through the fundamental research to the actual solution of the problems. Applied research tackles practical problems, as for example, industrial/ organisational psychologists study and help organisations select and train employees. They boost morale of the employees and also their productivity. They design products and answer people's responses to them. Besides the fundamental research and the applied research another type of research has recently been popular in the fields of social psychology, industrial psychology, and education. This is known as 'action research'.

In action research the researcher emphasises a problem which is immediate, urgent and has local applicability. Thus, the researcher here focuses upon the immediate consequences and applications of a problem and not upon general or universal application nor upon the development of a theory or a model. A teacher may undertake a research to know the reasons underlying unhealthy class-room habits so that immediate outcome may benefit the local class- room students. There are number of researches, given hereunder:

NON-EXPERIMENTAL RESEARCH

A non-experimental research is one where independent variables can not be manipulated. The researcher does not have complete control over the conditions of the non experimental research studies. For example, if you want to survey the television-watching behaviour of adolescents, you could do so by having them maintain a diary in which they record what shows they watch and with whom.

This descriptive study provides information about their television-watching habits but says nothing about why they watch what they do. You are not in any way trying to have an impact

on their television watching behaviour or investigate why they might watch particular shows. This is non-experimental in nature because no cause-and-effect relationships of any type are being hypothesized or investigated. Nonexperimental or descriptive research describes the characteristics of an existing phenomenon.

Census of any contrary, current unemployment rate of working single parents who have children under age 5 etc. are the examples of descriptive research. A second characteristic of non-experimental is that the data collection procedure often must forfeit some degree of control in return for obtaining the data. For example the researcher may decide to study public records that may be almost, but not exactly in the form we desire or researcher may have to keep a questionnaire start to help gain the cooperation of subjects.

1. Historical Research

Historical research relates past events to one another or to current events. Basically, historical research (or historiography) answers the question: what is the nature of events that have happened in the past? For example, one might want to examine trends in treatment of mental illness or how attitudes toward work and families have changed.

All of these questions require the detective work of a historian, finding and collecting relevant data and then, just as with any other research endeavour, testing a hypothesis. In fact, like any other researcher, the historian collects data, analyses them, and then comes to conclusions about the tenability of the hypothesis. One significant difference between historical research and other types of research is the type of data collected and the method of collection.

Researchers who do historical research often accomplish this goal through the use of primary sources (original documents or information from people who have personally experienced an event) and secondary sources (second hand documents or information from people who may have some knowledge about the event but did not experience it first hand). Even if these sources are readily available, however, one of the greatest challenges doing such research is in knowing how much faith the researcher can put on the accuracy of the sources. Examining the trends in achievement level of Indian children compared with American children is an example of historical research.

2. Descriptive Research

Descriptive research describes and interprets what is. It is concerned with conditions or relationships that exist, the practices that prevail, the beliefs or attitudes that are held, the processes that are going on; effects that are being felt or trends that are developments. The approach is directed towards identifying various characteristics of research problems and to create observations conducive to further research. Descriptive research describes characteristics of an existing phenomenon. Descriptive research provides a broad picture of a phenomenon you might be interested in exploring. Current employment rates, census of any country, number of working single parents are examples of descriptive research.

3. Correlational Research

Descriptive and historical research provides a picture of events that are currently happening or have occurred in the past. Researchers often want to go beyond mere description and begin discussing the relationship that certain events might have to one another. The most likely type of research to answer questions about the relationship among variables or events is called correlational events. Correlational research provides some indication as to how two or more things are related to one another or, in effect what they share or have in common or how well a specific outcome might be predicted by one or more pieces of information.

Correlational research uses a numerical index called the correlation coefficient as a measure of the strength of this relationship. For example, if you are interested to find out the relationship between the number of hours spent in studying and their achievement, then you would be doing correlational research, because you are interested in the relationship between these two variables. If you are interested in finding out the best predictors of success in a school you would be doing a type of correlational research that includes prediction. One of the most important points about correlational research is that it examines relationships between variables but in no way implies that one causes changes in the other. In other words, correlation and prediction examine associations but not causal relationships, wherein a change in one factor directly influences a change in another.

4. Qualitative Research

The general purpose of qualitative research methods is to examine human behaviour in the social, cultural, and political contexts in which they occur. This is done through a variety of tools, such as interviews, historical methods, case studies, and ethnography and usually results in qualitative (or non-numeric) primary data. In other words, the qualitative researcher is more (but not only) interested in the contents of an interviewee's speech than in the number of times (frequency) a particular comment is made.

Qualitative research is relatively new to the social and behavioural sciences and, to a large extent its increasing popularity is due to a degree of dissatisfaction with other available research methods. Some scientists feel that the traditional experimental model is just too restrictive and narrow, preventing underlying and important factors and relationships from being revealed. But what's so valuable about this set of tools is that it allows you to answer a whole new set of questions in a whole new way.

Qualitative research is the interpretive study of a specific issue or a problem in which the researcher is central to the research process. It's a naturalistic inquiry, which unfolds in a non-manipulative fashion. It lacks the predetermined constraints on outcome variables. Qualitative methods yield data in the form of words than numbers. Qualitative studies provide rich description and explanation of processes in specific local contexts. They provide a feel of the processes by focusing on the chronological flow or sequence of events leading to certain outcomes or consequences. The whole phenomenon is studied with a strategy of a detailed or elaborate (thick) description. Throughout the conduct of qualitative study interpretation and reflection on the part of researcher is required.

Qualitative data can come from a variety of sources and can take a variety of forms. The data may be used as a supplement to quantitative data or may be used in their own right. Qualitative data can be obtained through a variety of methods such as case studies, interviews, discourse analysis, narratives, and ethnography and participant observation.

5. Ex-Post Facto Research

In this kind of research, the independent variable or variables have already occurred in which the researcher starts with observation of a dependent variable or variables. He then studies the independent variables in retrospect for their possible relations to and effects on the dependent variable or variables. The most important difference between experimental research and ex-post facto research is control. In the former, the investigator has a manipulative control on the independent variable, whereas in the latter this control is not possible, more than this, randomization is not possible. In the ex-post facto research, the researcher must take things as they are and try to collect data and analyse them in that context.

In an ideal social scientific research, the possibility of finding random samples of subjects and randomly assigning them to groups and treatment to group would always be possible. However, these possibilities do not exist in the real situation. The ex-post facto research could be of a large scale or a small scale. This type of research has three weaknesses:

- 1) the inability to manipulate the independent variables,
- 2) lack of power to randomize, and
- 3) the risk of improper interpretation.

In other words, compared to experimental research, other things being equal, ex-post facto research lacks control. This lack is a basis for the third weakness: the risk of improper interpretation. Therefore, committing unequivocally to experimentation or to ex-post facto research may be poor policy; Ex-post facto research may not have particular hypothesis as a predicted relationship may be quite spurious. Therefore, ex-post facto research that is conducted without hypothesis, without predictions, research in which data are just collected and then interpreted is even more dangerous in its power to mislead.

B. EXPERIMENTAL RESEARCH

You already know that correlational research can help to establish the presence of a relationship among variables but does not provide any reason to believe that variables are causally related to one another. How does one find out if characteristics, behaviour, or events are related in such a way that the relationship is causal one? There are two types of research that can answer that question: true experimental research and quasi-experimental research.

1. True Experimental Research

In true experimental research, participants are assigned to groups based on some criterion, often called the treatment variable or treatment condition. For example, you want to compare effects of two different techniques for reducing obsessive-compulsive

disorder behaviour in adults. The first technique includes behavioural therapy and the second does not. Once adults are assigned to groups and the programs are completed, you will want to look for any differences between the two groups with regard to the effects of the therapy on the number of obsessive-compulsive behaviours. Because assignment to the groups is determined by the researcher, the researcher has given assignment to the groups as determined by the researcher, and thus the researcher has complete control over the factors to which the adults are exposed. This is the ideal model for establishing a cause and effect relationship because the researcher has clearly defined the possible cause and can keep very close tabs on what is happening. Most important, however is that the researcher has complete control over the treatment.

2. Quasi-Experimental Research

In quasi-experimental study, the researcher does not have a such a high degree of control because people have already been indirectly assigned to those groups (e.g., social class, type of abuse, gender, type of injury) for which you are testing the effects. In these researches participants are preassigned to groups based on some predetermined characteristics or quality. Differences in gender, race, age, grade in school, neighborhood of residence, type of job, and even experiences are examples. These groups assignments have already taken place before the experiment begins, and the researcher has no control as to who is assigned to each groups.

The most important use of the quasi experimental method occurs where researchers cannot, in good conscience, assign people to groups and test the effects of group membership on some other outcome. For example, researchers who are interested in the effects of parental unemployment on children could not very well encourage mothers or fathers to quit work. Rather, they would seek out families where parents are already unemployed and then conduct the research.

Quasi-experimental research is also called post hoc, or after-the-fact, research because the actual research takes place after the assignment of groups (e.g., employed versus unemployed, malnourished versus non malnourished, male versus female). Because assignment has already taken place, the researcher has a high degree, but not the highest degree, of control over the cause of whatever effects are being examined. For the highest degree of control to occur, the true experimental model needs to be followed

METHODS OF RESEARCH

Methods of research can be classified into two categories: Non-experimental methods and experimental methods

1. Non-Experimental Methods

i. Naturalistic Observation

Sometimes all researchers need to know is what is happening to a group of animals or people. The best way to look at his behaviour of animals or people is to watch them behave in their normal environment. In naturalistic observation a scientist observes behaviour in real world settings and makes no effort to manipulate or control the situation. Researchers conduct naturalistic observation at homes, day-care centers and so on. For example, if someone wanted to know how adolescents behave with members of the opposite sex in a social setting

the researcher might go the mall on a weekend night. The most important advantage of naturalistic observation is that it allows researchers to get a realistic picture of how behaviour occurs because they are actually watching that behaviour. In many cases animals or people who know they are being watched will not behave normally anyway in a process called the observer effect so often the observer needs to remain hidden from view. In these cases researcher might use one way mirror, or they might actually become participant in the group. This technique is called participant observation.

One of the major disadvantages of the naturalistic observation is the possibility of observer bias. That happens when the person doing the observing has a particular opinion about what he or she is going to see or expects to see. Sometimes that person sees only those actions that supports that expectation and ignores actions that don't fit. Another disadvantage is that each naturalistic setting is unique and unlike any other. Observations that are made at one time in one setting may not hold true for another time even if the setting is similar because the conditions are not going to be exactly the same time after time, researchers don't have that kind of control over the natural world.

- 3. Archival Research** In this method the researchers do not actually collect data themselves but they obtain data from public records, archives and so on. The researches merely analyses the data attempts to draw certain conclusions from them. The method can be valuable in many respects. For instance there is no other way to collect data on suicides and homicides. Archival Data are those that are present in existing records or archives. The researcher simply examines or selects the data for analysis. Archival research may already exist or logistics or ethics may make it infeasible to conduct an experiment relating the variables of interest.

Archival research has limitations; First most archival data are collected for naturalistic reasons. Governments or private agencies collect the data for their own purpose and such data often do not suit the purposes of the scientist. Second because archival research is by nature carried out after the fact ruling out alternative hypotheses for particular observed correlations may be difficult. A researcher who relies on archival data is at the mercy of any biases that may have occurred in collecting the data. Police records are notoriously subject to bias. Many categories of crime are seldom reported to the police.

4. Content Analysis

Content analysis sometimes known as document analysis is a method of systematic, examination of communications or of current records or documents. Instead of questioning respondents according to some scale items or observing their behaviour directly the content – analyser takes the communications or documents prepared by the respondents and systematically find out the frequency or proportion of their appearances.

In content or documents analysis the primary sources of data are: letters, autobiographies, diaries, compositions, records, reports, printed forms, themes or other academic work, books, periodicals, bulletins or catalogues, syllabus, court decisions, pictures, films, cartoons etc. It is the obligation of the researchers to establish the trustworthiness of these data that have been drawn. Content analysis can also be used

with responses of projective test with all kinds of verbal materials and with materials specially produced for research problems.

Merits and Demerits

First content analysis is applicable to a wide variety of materials such as creativity, attitude, and ethnocentrism, stereotypes, curriculum changes, values, interest, religiosity, college budgets etc.

Second content analysis can also be used to examine the effect of experimental manipulation upon the dependent variables. If the investigator wants to study the effect of practice upon the improvement of handwriting of children, content analysis may be of no less importance than any experimental design.

Third content analysis is also used to validate other methods of observation.

Suppose one wants to validate a self-disclosure inventory. It is expected that people in general would not like to give personal information against which the test can be validated. But subjects can be asked some projective-type of questions and the responses can be content-analysed. Subsequently the test can be validated against the content-analysed response.

Despite these merits content analysis should be used with caution because of the complexities involved.

ii. Surveys

Survey methods are widely used gathering scientific information. It involves collection of data by asking questions and recording people's answers to them. They are used for various purposes on frequent goal of this kind of research is to estimate population characteristics. For example the goal of survey might be to determine the percentage of people who hold supporting or opposing positions on particular social issues, such as provision of reservation for women in job. The census and public opinion done by various agencies are good examples of surveys. Surveys can also be used to test hypotheses about the relationships among variable. One may try to find out the effect of some event on people's behaviour. For example surveys have been conducted after the earth quack at Bhuj in Gujarat to find out the impact of earthquake on people's lives.

In undertaking surveys the researcher defines the study population and draws the sample. The sample must be representative of the population. Researcher use different procedures of sampling. They can use random sampling in which every member of the population has a equal and independent chance of being included in the sample. Usually the researcher use stratified random sampling in which two or more sub samples are represented according to some predetermined proportion as they exist in the population. Sometimes groups are selected by using clusters or groupings from a larger population. This is known as cluster sampling. The sample size is also determined because the ability to generalise depends on the sample size used in the survey.

Depending upon the ways of collecting data survey methods can be classified into different categories namely personal interview, mail questionnaire, telephone survey, internet survey, web survey, etc.

Advantages:

Survey methods have wide scope. In other words through survey method a great deal of information can be obtained by studying the larger population

It is more accurate. As Kerlinger (1986) has put it.” The accuracy of properly drawn samples is frequently surprising, even to experts in the field. A sample of 600 to 700 individuals or families can give a remarkably accurate portrait of a community its values attitudes and beliefs.

Survey methods has been frequently used in almost all the social sciences. Hence the method has inter-disciplinary value. In fact such researches provide raw materials for a vast increasing “gross disciplinary research” (Cambell & Katona,1953).

Survey method is considered a very important and indispensable tool for studying social attitudes, beliefs, values etc. with accuracy at the economic rate.

Disadvantages:

Survey methods remains at the surface and it does not penetrate into the depth of the problem being investigated.

Survey method are time consuming, and demand a good amount of expenditure.

Although it is true that survey research is accurate, it is still subject to sampling errors. In survey research there is always the probability of one chances in a twenty or hundred with an error, more serious than minor fluctuation of a chance, may occur and distort the validity of the result obtained.

Survey method demands expertise, research knowledge and sophistication on the part of the researcher. In other words the researcher must know the techniques of sampling, questionnaire construction, interviewing and analysis of data.

iii. Field Studies

Field studies are ex-post scientific inquiries aimed at discovering the relations and interactions among sociological, psychological and educational variables in real social structures. In scientific studies, large or small, they systematically pursue relations and test hypotheses, that are ex-post facto, that are made in actual life situations, will be considered field ex-post factor, that are made in actual life situations, will be considered field studies. The investigator in a field stud looks at the social or institutional situation and then studies the relations among the attitudes, values, perceptions, and behaviours of individuals and groups in the situation. He ordinarily manipulates no independent variables.

Katz (1953) has divided field studies into two board types – exploratory and hypothesis testing. The exploratory types seek what is, rather than predict relations to be found.

They have three purposes : (1) to discover significant variables in the field situation, (2) to discover relations among variables (3) to lay a ground work for later, more systematic and rigorous testing of hypothesis.

It is well to recognise though that there are activities preliminary to hypothesis testing in scientific research. In order to achieve the desirable aim of hypothesis testing, preliminary methodological and measurement investigation must often be done. The second subtype of exploratory field studies, research aimed at discovering or uncovering the relations, is indispensable to scientific advancement in the social sciences.

The field studies are strong in realism, significance, strength of variables, theory orientation and heuristic quality. The realism of field studies is obvious. They are highly heuristic. Any researcher knows that one of the research difficulties of the field studies is to keep himself contained within the limits of his problem. Hypothesis is frequently flung themselves at one. The field is rich in discovery potentiality. After starting to gather data, he might stumble upon many interesting notions that can reflect the course of investigation.

Despite these strengths, the field study is a scientific weakness of laboratory experiments. Its most serious weakness of course is its ex-post facto character. Another methodological weakness is lack of precision in the measurement of field variables. Other weakness of field studies are practical problems: feasibility, cost, sampling, and time. The field researcher therefore, needs to be salesman, administrator and entrepreneur as well as investigator.

iv. Case Study

The case study is one of the important types of non-experimental research. The case study is not a specific technique rather it is one way of organising social data for the purpose of viewing social reality. It tends to preserve the unitary character of a social object being studied. It tends to examine a social unit as a whole. The unit may be a person a family a social group a social institution or even a community (Goode & Hatt 1981, Best & Kahn 1992).

A case study may utilise interview, observation, and psychological tests. It is a valuable research strategy in the fields of clinical psychology and human development. Using case study a researcher is able to have an in-depth look at one person. Those unique aspects of a person's life which cannot be duplicated for practical or ethical reasons are captured by case study. With the help of case study you can try to understand fantasies hopes fears traumatic experiences upbringing or anything that helps to understand a person's mind and behaviour.

Case studies provide a narrative or detailed description of the events that takes place in a person's life. Freud's insight that led to the development of psychoanalytic theory emerged from his observation and reflections on individual cases. It should be remembered that the person studied as a case is unique and our judgments are of unknown reliability. Case studies provide detailed in-depth depictions of people's lives but we need to exercise caution when generalizing from individual cases. They are like naturalistic observations and all one can do is to describe the course of events.

The problem of validity of single case study is very serious. It is therefore recommended that researchers should use objective measurement techniques multiple sources of information and frequent assessment of relevant variables. The uses of case study as a research strategy requires that the cases must be chosen that represent the variable in question and one must have sufficient access to the cases. Careful planning of data collection is very necessary. Throughout the data-collection process the investigator is required to maintain a chain of evidence linking the various data sources having bearing on the research questions.

EXPERIMENTAL METHODS

1. Laboratory Experiments

As you know a laboratory experiment is one of the most powerful techniques for studying the relationships between variables under controlled condition. It may be defined as the study of a problem in a situation in which some variables are manipulated and some are controlled in order to have an effect upon the dependent variable. The variables which are manipulated are known as independent variables and the variables which are controlled, are known as extraneous or relevant variables. Thus in a laboratory experiment the effect of manipulation of an independent variable upon the dependent variable is observed under controlled conditions. Festinger & Katz (1953:137) have defined a laboratory experiment as “one in which the investigator creates a situation with the exact conditions he wants to have and in which the controls some, and manipulates other variables”.

Kerlinger (1986), there are three main purposes of the laboratory experiment. First, a laboratory experiment purports to discover a relationship between the dependent variable and the independent variable under pure, uncontaminated and controlled conditions. When a particular relationship is discovered, the experimenter is better able to predict the dependent variable. Second, a laboratory experiment helps in testing the accuracy of predictions derived from theses or researches. Third, a laboratory experiment helps building the theoretical systems by refining theories and hypotheses and thus, provides a breeding ground for scientific evaluation of those theories and hypotheses.

A laboratory experiment has some strength and weakness you have already read in the previous unit II, you may refer this for the detailed thereof.

2. Field Experiment

A field experiment is very similar to a laboratory experiment. A field experiment may be defined as a study carried out in a more or less realistic situation or field where the experimenter successfully manipulates one or more independent variables under the maximum possible controlled conditions. Experimenter manipulates one or more independent variable in natural setting for determining their effect upon behaviour, the procedure is known as field experiment. Field experiment has number of Strengths which are given below:

- 1) A field experiment deals with the realistic life situation. Hence it is more suited for studying social changes, social processes and social influence.
- 2) One principle of research is that the more realistic the situation, the stronger is effect of the variables under study. In a field experiment this principle is fully satisfied. Thus, one can say that in the field experiment, since it deals with a realistic situation, the variables have stronger and more obvious effects.
- 3) Is derived from the above two points. When variables are stronger because of more realistic situations, an experimenter can make better and sounder generalisations on the basis of the obtained results. In other words, this tends to increase the external validity of the field experiment. For example, when one carried out a field experiment by taking small groups of workers from a factory, and reaches the conclusion that absenteeism among workers is primarily due to the poor financial incentive, this can be safely generalized with respect to

the workers of other factories as well because the experiment has been carried on actual workers in a factory.

4) A field experiment is well-suited for testing a broad hypothesis and theories and for obtaining answers to practical questions.

The principles **weaknesses of field experiments** are as given below:

1) Since a field experiment is carried out in a realistic situation, there is always the possibility that the effect of independent variables is contaminated with uncontrolled environmental variables.

2) The unexpected noise and gathering may affect the dependent variable and thereby, contaminate the influence of the independent variable. In a laboratory experiment this problem does not arise because of the fully controlled laboratory situation.

However, if the situation is somehow fully controlled in a field experiment, it would prove to be a more powerful tool than the laboratory experiment.

3) In many field situations the manipulation of independent variables may be difficult due to non-cooperation of subjects. Children are to be exposed to frustrating situations; they may not like it and may restrain their children from being exposed to field situation.

4) In a field experiment it is not possible to achieve a high degree of precision or accuracy because of some uncontrolled environment variables.

5) Field experiment requires that the investigator has high social skills to deal effectively with people in a field situation