# B.Aadhar

## Single Blind Peer-Reviewed & Refereed Indexed

### Multidisciplinary International Research Journal

## January- 2024

"Souvenir on
## Research Methodology"

**Chief Editor**
**Prof. Virag S. Gawande**
**Director**

A. S.R. & D.Training Institute Amravati

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(Director, R. M. Workshop )
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(Co-Director, R. M. Workshop )
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(20 January  to 29 January 2024)

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Aadhar Social Research &, Development  Training Institute, Amravati.

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NAAC Accredited by Grade - "A" with CGPA 3.19 (3rd Cycle)

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**Indian Council of Social Science Research**

# "Souvenir on Research Methodology"

(20 January to 29 January 2024)

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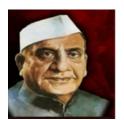
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Under , Internal Quality Assurance cell

And Research Development Centre

Organized

# Ten - days online National workshop on Research Methodology Course -

Sponsored by Indian Council of Social Science Research (ICSSR), Western Regional Centre , Mumbai.

From 20 January to 29 January 2024

Time: 12:00 Noon to 2:00 p.m.

Venue: MVDM Hall

| **Organizing Secretary:** | **Convener** | **Co-Convener** |
|---|---|---|
| Dr. S. R. Deshmukh, Principal | Dr. Prof. D. R. Bambole | Dr. M. M. Nandurkar |

## Message

It gives me immense pleasure to know that Shri Shivaji Education society's MatoshreeVimalabai Deshmukh Mahavidyalaya, Amravati,NAAC accredited with A Grade (CGPA A CGPA3.19 ) has organized ten-days National Workshop on "Research Methodology Course" from 20 January to 29 January 2024 sponsored by Indian Council for Social Science Research (ICSSR), Mumbai.

Research Methodology serves as the cornerstone for any academic pursuit, guiding scholars through the intricate maze of inquiry, analysis, and discovery. In an era marked by the rapid evolution of knowledge and technology, the research is need of an hour. It is definitely a pleasure that this college has taken a good initiative under the able guidance of Principal to improve the quality of research in Higher Education. I am sure that the workshop would enhance the ability to apply the right tools and techniques in conducting research.

I convey my best wishes to the principal and organizers for organizing and publishing the proceeding with ISBN and wish the workshop a grand success.

Dr Milind Barhate
Vice – Chancellor
Sant Gadgebaba Amravati University, Amravati

# Message



      I am happy to know that Matoshree Vimalabai Deshmukh Mahavidyalaya, NAAC A Grade with CGPA 3.19, under the able guidance of Principal, Research Development committee has organized, the ten-days National workshop on "Research Methodology Course" in association with Indian Council for Social Science Research (ICSSR) Mumbai. At the beginning I congratulate the team for organizing such an academic event to promote research culture. Research is one of the most important aspects of education in higher education worldwide.

      The proposed ten days' workshop on "Research Methodology Course" from 20/01/2024 to 29/01/2024 will improve the knowledge and skills of the participants to carry out quality research, enhance their ability to apply the right tools and techniques in conducting research and write research papers. This workshop aims to provide wide opportunities for Social Science Researchers for improving practical knowledge in research methodology, qualitative data analysis, and quantitative data analysis skills using statistical software. The platform in the form of the Workshop will serve its purpose to the fullest extent.

      I extend my heartfelt wishes to the organizers for the publication of proceeding with ISBN and for the grand success of the academic event.

Shri. Harshvardhan P. Deshmukh
President,
Shri Shivaji Education Society, Amravati

# Message

It is indeed a matter of great pleasure for me that MatoshreeVimalabai Deshmukh Mahavidyalaya, Amravati is organizing "Research Methodology Course", the ten days National workshop in association withIndian Council for Social Science Research (ICSSR) Mumbai and publishing a proceeding on this occasion.

This Workshop from 20/01/2024 to 29/01/2024on "Research Methodology Course" will help the Researchers and Academicians for understanding the basics of Research Methodology, Research Gap, Research Question, Research Problem, Research Design, Qualitative Data Collection, Selecting the topic for Research, method of data collection, Mechanics of Research Manuscript Drafting, Ethical issues in Research.

This Workshop will help the research scholars about the basics of conducting Quantitative and Qualitative research as well as analysis of Qualitative Data, application of Software and how to design research questions,write interview questions, and conduct observations. Also, research scholars will also be introduced to basic data analysis techniques, and how to publish and present their research.

I must congratulate all the faculties who are putting their efforts together to bring the diverse academic fraternity on a single platform where they can put forward their ideas regarding research methodology. I am assured that the delegates will discuss the quality research questions at a level of efficiency that will support the experience of attending the workshop.

I would like to thank all participants and organizing teams and wish the event to be grand success.

(Shri. Hemant W.Kalmegh)
Executive Member,
Shri Shivaji Education Society, Amravati

# Message



At the outset I express my humble tribute to Source of inspiration Dr Panjabrao and Adv. Vimalabai Deshmukh. I wish to express my sincere appreciation to the coordinators, resource persons and to congratulate all the committee members of MatoshreeVimalabai Deshmukh Mahavidyalaya Amravati, for organising ICSSR sponsored workshop on Research Methodology. In this proceeding, the authors have meticulously expressed their insights, techniques, and best practices, offering a roadmap for both novice researchers.

From the foundational principles of research design to the nuances of qualitative and quantitative methodologies, this proceeding equips scholars with the tools they need to embark on their intellectual journeys. Moreover, it underscores the ethical imperatives that underpin all scholarly inquiry, emphasizing the importance of integrity, transparency, and accountability in the pursuit of knowledge.

As we stand on the precipice of a new era of discovery, characterized by unprecedented challenges and opportunities, the insights gleaned from this volume will undoubtedly serve as a beacon of guidance and inspiration for generations of researchers to come. May it inspire inquisitive minds to embark on a quest for truth, and may it pave the way for transformative insights that enrich our understanding of the world around us. My best wishes to writers for their articles and all researchers to strengthen quality research culture in the institute.

Dr Smita Raosaheb Deshmukh

Principal

MatoshreeVimalabai Deshmukh Mahavidyalaya

Amravati

## INDEX

# Introduction to Research Methodology
## Dr. Smita R. Deshmukh

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**Abstract**

Research methodology is structural process, which is a supporting subject in several ways in many academic disciplines such as health, education, psychology, social work, nursing, public health, library studies, marketing research and sciences etc. It is an important activity of any nation and societies for generating the information to its developments. Robust collection of qualitative information helps in the development of the any nations. Research is a systematic investigation with open mind. It is an important tool for acquiring new knowledge in any field of human survival. Various type of problems and questions need to use research methodology depend on the rationale of researchers. How to use the research for finding answers of any research questions/problems. Methodology is the central and most crucial component, element for carrying out any research endeavour. A researcher has to be well-equipped and must have command over method. Even otherwise, continuing discourse on methodology component of research in social sciences within fraternity of social scientists is vital exercise as there is always a scope of innovation and change in that sphere. Methodology needs modifications with changing scenario and contexts. Research Methodology provides an understanding of the concepts and techniques of qualitative and quantitative research, report writing, data collection etc.

**Keywords:** Researchmethodology, knowledge, review, collection, selection, analysis.

**Introduction**

Research simply seeks the answer of certain questions which have not been answered so far and the answers depend upon human efforts. Research answers only those questions of which the answers are not available in literature i.e., in human knowledge. Thus, we can say research seeks the answer only of those questions of which the answers can be given on the basis of available facilities. The research is a process of which a person observes the phenomena again and again and collects the data and on the basis of data he draws some conclusions. According to Rusk "Research is a point of view, an attitude of inquiry or a frame of mind. It asks questions which have hitherto not been asked, and it seeks to answer them by following a fairly definite procedure. It is not a mere theorising, but rather an attempt to elicit facts and to face them once they have been assembled. Research is likewise not an attempt to strengthen up pre-conceived opinions, and it implies a readiness to accept the conclusions to which an inquiry leads, no matter how unwelcome they may prove.

Actually, research is simply the process of arriving as dependable solution to a problem through the planned and systematic collection, analysis and interpretation of data. Research is the most important process for advancing knowledge for promoting progress and to enable man to relate more effectively to his environment to accomplish his purpose and to resolve his conflicts. Although it is not the only way, it is one of the more effective ways of solving scientific problems. Research is oriented towards the discovery of relationship that exists among phenomena of the world in which we live.

**General Characteristics of Research**

The following characteristics may be gathered from the definitions of 'Research'

- It is logical and objective.
- It gathers new knowledge or data from primary or first-hand sources.
- It uses certain valid data gathering devices.
- It places emphasis upon the discovery of general principles.
- It is an exact systematic and accurate investigation.
- The researcher resists the temptation to seek only the data that support his hypotheses.
- The researcher eliminates personal feelings and preferences.
- It endeavours to organise data in quantitative terms.
- Research is patient and unhurried activity.
- The researcher is willing to follow his procedures to the conclusions that may be unpopular and bring social disapproval.

● Research is carefully recorded and reported.
● Conclusions and generalisations are arrived at carefully and cautiously.

**The Functions of Research**

The following are the main functions of research:The main function of research is to improve research procedures through the refinement and extension of knowledge.

**Perception of Research**

The refinement of existing knowledge or the acquisition of new knowledge is essentially an intermediate step toward the improvement of the social studious process. The social studies improvement is associated with various aspects of Social Studies:

(a) The function of research is to aid to making a decision concerning the refinement or extension of knowledge in this particular area.

(b) The function of research is to improve the students learning and classroom problem with which teacher is encountering with problems. The more effective techniques for teaching can be developed.

(c) Another function of research is to aid social studies administrators to improve the Social Studies systems. The Researches should contribute to the theory and practice of study studies simultaneously. It should have the image of a helpful mechanism which can be used by researcher/research scholar in one way or the other, for the improvement of the process

According to George J. Mouly He defines research as, "The systematic and scholarly application of the scientific method interpreted in its broader sense, to the solution of social studies problems; conversely, any systematic study designed to promote the development of social studies as a science can be considered research."

**Objectives of Research**

The research has the following three objectives:

➤Theoretical objective
➤Factual objective and
➤Application objective.

1. Theoretical Objective: Those researches whose objectives are theoretical formulate the new theories, principles or laws. Such type of research is explanatory because it explains the relationships of certain variables. These researches contribute some basic knowledge to the human knowledge. The researches in different disciplines i.e., Physics, Chemistry, Mathematics etc. have the theoretical objective.

2. Factual Objective: Those researches whose objective is factual find out new facts. This objective is by nature descriptive. These researches describe facts or events which happened previously. Such type of research is done in history. 8 Fundamental of Research Methodology

3. Application Objective: The research having application objective does not contribute a new knowledge in the fund of human knowledge but suggests new applications. By application we mean improvement and modification in practice. For example, if anyone gives a new application of electricity then such type of research has application objective.

**Types of Research**

There are three types of objectives of research: theoretical, factual and application. The first two types of objectives of research contribute new knowledge in the form of new theory and facts in a particular field of study or discipline. The third objective does not contribute to knowledge but suggests new application for practical problems.

Thus, the research is classified broadly into two categories:

a) Fundamental or Basic research,
b) Action research or Applied research.

Action research is organized, investigative activity, aimed towards to study and constructive change of given endeavour by individual or group concerned with change and improvement. On the basis of these definitions of action research, the following characteristics may be enumerated:

● It is a process for studying practical problems of social studies.
● It is a scientific procedure for finding out a practical solution of current problem.
● The practitioner can only study his problem.
● It is personal research for clinical research work.
● The focus is to improve and modify the current practices.
● The individual and group problems studied by action research.
● It does not contribute to the fund of knowledge.

The origin of action research is also considered from the field of psychology or social psychology. Kurt Lewin explains life space in terms of person and goal. There is a barrier in between person and goal. He was to overcome the barrier to achieve the goal. 'It depends on the abilities of the person to achieve the goal. The person's activities are governed by the goal. The practitioner has to face this type of situation. The identification and analysing a research problem is the first and most crucial step of research process. The steps of research are drawn from reflective thinking. The following are the six steps of research:

➢Selection of the problem.
➢Formulation of hypotheses.
➢Design of research.
➢Collection of data.
➢Analysis of data.
➢Formulation of conclusions.

**Objectives of Action Research**

The action research projects are conducted for achieving the following objectives:

● To improve the working conditions of school plant.
● To develop the scientific attitude among teachers and principals for studying their problems.
● To develop the scientific attitude among students and teachers for understanding and solving their problems.

A good research worker should possess the following qualities

➢He should have the full understanding about the functions and activities of his job.
➢He should have the reflective thinking about various dimensions of his job activities.
➢He should be sensitive towards his job. A sensitive person can perceive the problem. Most of the teachers are problem blind because they are not sensitive towards the job.
➢He should be creative and imaginative. These abilities are essential in formulating the action hypotheses for his problem.
➢He should have the knowledge and training of action research.
➢He should have insightful into his area. During his teaching experience he can identify the real problem on the basis of his insight.
➢He should have the scientific attitude for studying and observing things.
➢There should be an objectivity in his thinking.
➢His behaviour should be democratic. The action research design should not intervene the activities of other teachers of school activities.
➢The most important characteristics is the patience and pursuant of the investigator.
➢He should have knowledge and skill of measuring instruments and elementary statistics. 12. He should have open mind so that he can discuss his problems with his colleagues and experts of the field to have correct picture of the problem.
➢He should have an urge to bring about excellence in job economic performance.
➢He should be economical in designing the project from time, energy and money point of view

**Steps of Action Research**

The research work is done by reflective thinking and not by traditional thinking. The reflective thinking functions systematically.In designing and conducting action-hyper-research project the following steps are followed:

● **Identification of Problem**
A teacher should be sensitive towards job activities. The problem is isolated from the broad field. The investigator must realize the seriousness of the problem.

● **Defining and Delimiting the Problem**
After Identifying the problem, it should be defined so that action and goal may be specified. The delimitation means to localize the problem in terms of class subject, group and period in which a teacher perceives the problem.

● **Analysing Causes of the Problem**
The causes of the problem are analysed with the help of some evidences. The nature of the causes is also analysed whether it is under the control or beyond the control of the investigator. This helps in formulating the action hypothesis.

● **Formulating the Action Hypotheses**

The basis for the formulation action-hypotheses are the causes of the problem which are under the approach of the investigator. The statement of action-hypothesis consists of the two aspects: action and goal. It indicates that the action should be taken for achieving the goal.

● **Design for Testing the Action Hypothesis**

A design is developed for testing the most important action-hypothesis. Some actions may be taken and their results are observed. If the hypothesis is not accepted second design is developed for testing another hypothesis. In action-research one hypothesis is tested at a time. The design of action-research is flexible and can be changed at any time according to the convenience of the researcher.

● **Conclusions of Action Research Project**

The normal human mind thinking may be classified into four categories: convergent, divergent reflective and scientific thinking. In reflective thinking individual conceived for a new solution for an old problem, but scientific thinking is in terms of carefully organized reflection.

**The Research Proposal or Synopsis**

The synopsis contains a clear and concise statement of the problem, the hypothesis  involved, a recognition of the significance of the problem, definitions of the important  terms, assumptions and limitations, a resume of related literature, an analysis of proposed  research producers, and a time schedule. A research proposal or research synopsis or an  outline of proposed works required by many universities and institutions, serves as a useful  basis for the evaluation of a project as well as a guide line for the researcher. The  preparation of a research proposal or synopsis is an important step in the research process. A worthwhile research work is likely to result only from a well-prepared and well-designed proposal or research synopsis.A research proposal includes. the following essential parts:

➢ The statement of the problem.
➢ The Review of literature or theoretical framework of the study.
➢ The Hypotheses and objectives.
➢ The Methodology and procedure of the study.
➢ Educational implications or significance of the problem.
➢ Definitions, assumptions and delimitations.
➢ A tentative structure of the report.
➢ Bibliography.

**The Statement of the Problem**

This attempt to focus on a stated goal gives direction to the research process. It must be limited enough in scope to make a definite conclusion possible. A problem suggests a specific answer or conclusion. The statement of the problem should be written in specific clear-cut words.

**The Review of Related Literature**

A brief summary of previous research should be given so that the researcher and reader may be familiar with what is already known and with what is still unknown and untested. The effective research is based upon past knowledge, this step helps to eliminate replication of what has been done and provides useful basis for the formulation of hypotheses and deciding the methodology of the study. A review of related literature should conclude with a comment of area of agreement and disagreement in findings. Assortment of Problem

**The Hypotheses**

A scientific study is based on hypotheses. It may be appropriate here to formulate a major hypothesis and several hypotheses. This approach clearly establishes the nature of the problem and the logic underlying the investigation. The hypothesis indicates the expected outcomes the investigation. The formulation of the hypotheses in advance of the data- gathering process is necessary for an unbiased investigation. The hypotheses should be first stated in positive or substantive form. In every investigation hypothesis cannot be formulated but objectives of the study can be written to indicate the direction of the research work.

**Methodology and Procedure of the Study**

This part of the proposal outlines the entire research plan. Under this part of the synopsis method, sample, population, tools and statistical analysis techniques are described in view of testing the formulated hypotheses. It describes just what must be done, how it will be done, what data will be needed, what data-gathering devices will be employed, how sources of data will be selected, and how the data will be analysed and conclusions be drawn.

### Educational Implication or the Significance of the Problem

It is important part of research synopsis in which research points out the answer to the question or the solution to the problem may influence educational theory or practice. The implication of the finding of the study helps to give the project an urgency, justifying its worth. Social Studies Research study must have its implication to educational practices.

### Definitions, Assumptions and Limitations

At this stage operational definitions of terms are usually given in research proposal so that statement of the problem must convey the specific meaning. The variables of the study should be defined clearly and unambiguously in operational terms. A study involves several variables which play different roles in the investigation. The role of the variable depends on the assumptions of the study. The sample of the study will be representative of the population. The assumptions of the study vary study to study. The feasibility of an investigation depends on the delimitations of the study. A study is delimited to its variables, sample, method, tools and statistical techniques of the study. These delimitations should be clearly mentioned in the synopsis of the study.

### Structure of the Report

A tentative structure of the report is also written. It includes the list of chapters which will be included in the report of the thesis. These may be: Introductory or a theoretical framework. Review of literature, Methodology and procedure of the study. Data collection and Analysis of data, conclusions of the study.

### Bibliography

The last part of the proposal provides the list of references in the form of bibliography which includes books of research, or conceptual framework, hand-books encyclopaedia, journals and unpublished and published thesis on the related area of the study

### Conclusion

Research methodology is a way to solve the research problem systematically. It may be understood as a science of studying how research is done scientifically. In it we study the various steps that are generally adopted by a researcher in studying his research problem along with the logic behind them. Research is not only to develop the process or to find a formula as we do in the science. But in the field of social science the research work is oriented towards the solution of a problem or to seek an answer of a question. The first step of a research process is to identify a problem. The selection of a problem is governed by reflective thinking. Unthinking activity is governed too completely by tradition or by emotion. Primitive life was largely without effective reflective thought, until some intelligent individual conceived of a new solution for an old problem. Therefore. upper educational groups ever do much careful ordered thinking and relevant skills, additional library sources will be helpful, such as specialized dictionaries and biographical references in formulating the research definitions, to understand all of the concepts that we discover in the research.

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# Application Of Mathematical Tools In Modern Business

## A.H.Chakrapani[1] , P.S. Deshmukh[2] , M.D. Farkade[3]

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**Abstract**

Mathematics plays a crucial role in business management as it is intertwined with financial aspects. Business operations, involving money, necessitate mathematical knowledge for decision-making. Business mathematics is utilized in various activities such as accounting, financial analysis, sales, and more. Commercial entities employ mathematics in accounting, inventory management, marketing, sales forecasting, and financial analysis. It enables understanding of financial formulas, fractions, and measurements essential for tasks like interest calculation, rent rates, salary computation, and tax assessment. Business mathematics encompasses statistics, offering solutions to business challenges. In the realm of business and commerce, mathematics is indispensable for efficient and informed decision-making

**Keywords**   : Mathematics, Business, Statistics and Commerce

**Concept of research**

Mathematics is the backbone of any business. Because a business primarily revolves around the transaction of money or products that have some monetary value. Involvement of money makes it extremely important to have sufficient knowledge about the basics of calculations. Business is always surrounded with challenges which need to be dealt with in a proper fashion so that they do no arise in future. These problems that occur on a daily basis can be effectively solved with the help of mathematical models. Hence mathematics not only helps to calculate but also analyse business problems and work upon them. Learning and using business mathematics enables a person to think out of the box, sharpens one's thinking and helps in precisely formulating and structuring relationships. This is where business mathematics comes into play.

**IMPORTANCE OF MATHS IN BUSINESS**

To excel in business, expertise extends beyond product creation or service distribution; financial acumen is essential. Proficiency in business mathematics is crucial for sustaining profitable operations and maintaining accurate records. It plays a pivotal role from pricing products/services at the outset to evaluating budget adherence at the conclusion. Various situations within business operations necessitate the application of mathematical principles.

**1. Estimation of production costs**

Before embarking on production and company development, it is crucial to accurately quantify various costs, encompassing equipment, administrative expenses, rent, and raw materials. Essential expenditures should be meticulously assessed to establish a comprehensive understanding of the financial landscape. Additionally, ancillary costs like publicity, warehousing, taxes, and loan servicing should be factored in, extending beyond fundamental expenses. Once manufacturing costs are accounted for, swift prediction of income becomes paramount for sustaining profitability in the sector. Precisely determining costs associated with each commodity reinforces the foundation of a robust market presence.

**2. Price evaluation**

Following precise cost calculations, the subsequent crucial step involves strategically pricing goods to optimize cash flows based on market demand. Setting the right sale price is integral to maintaining competitiveness in the market. Mathematics plays a pivotal role in determining the optimal price for your product or service, necessitating consideration of all expenses, depreciations, and other liabilities associated with your company before establishing pricing strategies. This meticulous approach ensures a comprehensive and sustainable pricing model aligned with financial realities.

**3. Calculation of profit**

Profit calculation in business involves essential mathematics, where net income is determined by subtracting operational expenses from gross sales or revenue over time. Factors such as VAT, interest, and insurance costs must be excluded from the calculation to obtain an accurate representation

of profitability. This analysis aids in understanding whether products generate sufficient revenue to sustain and expand company activities, providing valuable insights for informed decision-making in business development.

### 4. Analysis of finance in your business

Evaluating a company's financial performance involves estimating income and expenditures, coupled with risk analyses to gauge the impact of revenue fluctuations or cost changes. Utilizing business mathematics enhances these assessments, providing a deeper understanding of industry dynamics.

To gauge current financial performance, estimating potential sales and expenditures is crucial. Understanding individual influence on sales helps determine staffing decisions and assess whether generated gains justify expenses. In the face of competitive pricing, business math aids in evaluating the impact of cost adjustments on value perception.

Considerations about increasing revenue to enhance operations require a careful examination of financial implications through business math. Before advancing your company, these calculations are essential for understanding how various actions affect overall finances, guiding informed decisions in business progression.

### Business Mathematics Scope

A career in business mathematics requires not only mathematical skills but also proficiency in areas like business management, finance, and economics. This multidisciplinary skill set opens doors in this demanding field. Effective written and oral communication skills are vital, as business mathematicians often collaborate in teams and engage with clients.

Given the universal need for businesses to manage resources and profits, many mathematicians find employment in these sectors. Their rational thinking and market-oriented problem-solving approach contribute significantly to addressing challenges in resource allocation and financial decision-making within businesses.

### MATHS TOOLS used IN BUSINESS

In business, various math tools are commonly used for financial analysis, planning, and decision-making. Some include:

1. Excel and Spreadsheets: Widely used for financial modeling, data analysis, and budgeting.

2. Financial Ratios:Calculations like profit margins, return on investment (ROI), and liquidity ratios helpassess a company's financial health.

3. Present Value (PV) and Future Value (FV): Used in finance for discounted cash flow analysis andinvestment valuation.

4. Statistics: Employed for market research, forecasting, and trend analysis.

5. Linear Programming:Optimizes resource allocation and production planning to maximize profits orminimize costs.

6. Break-even Analysis:Determines the point at which revenue equals costs, helping businesses set pricing and sales targets.

7. Time Value of Money (TVM): Evaluates the impact of interest rates and inflation on cash flows overtime.

8. Regression Analysis: Models relationships between variables, aiding in forecasting and decision-making.

9. Probability Models: Applied in risk assessment and decision analysis.

10. Game Theory: Used in strategic decision-making, particularly in competitive business environments.

These tools assist businesses in making informed decisions, managing finances, and optimizing operations.

### CONCLUSION

Mathematics holds a pivotal role in business, covering a spectrum of operations from basic to intricate. Online math calculators emerge as invaluable assets when tackling complex calculations, providing efficient and time-saving solutions for navigating the intricacies of business-related mathematical tasks. These calculators serve as practical aids, ensuring accuracy and efficiency across diverse business calculations. In the realm of business optimization, mathematical methods and tools are indispensable. Ratios and proportions contribute to financial analysis, and matrices play a vital role in addressing challenges within customer relationship management and logistics. The strategic application

of these mathematical tools is instrumental in achieving the business objectives of cost minimization and profit maximization

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# Investigative Research A Form of Research Technique

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**Abstract:**

Verifying a scientific hypothesis about the causal relationship between a collection of response characteristics and a set of explanatory qualities of a target population is the aim of explanatory research. The experiment is the explanatory research approach par excellence. In the experiment, the levels of one or more explanatory qualities are selected by the researcher, who also randomly associates these levels with the sample units and regulates the presence of extraneous features. Consequently, bias is prevented and there is less chance of the effects of extraneous qualities being confused with the impacts of the explanatory characteristics. The implications of this sample control are pertinent to conclusions. This study characterizes the experiment, illustrates the process of doing experimental research, and shows the evolution of experimental research.

**Keywords**: History of experimental research; Controlled experiment; Randomization; Experimental design;Experiment process;

**Introduction:**

The purpose of the experiment, which is an explanatory research method, is to draw conclusions about the causal relationships between the explanatory characteristics and response characteristics by purposefully imposing the levels of one or more explanatory characteristics on the sample's units. These are treatment-related or extrinsic traits. Additionally, the experiment may have intrinsic qualities that show up in the sample either freely or with very little researcher control. Levels of extrinsic traits are triggered by things like fungicides sprayed on plants or meals given to animals.

To provide researchers with an overview of this study approach, this article examines experimental research.

**Origin and Evolution of Experimental Research:**

Aristotle (384–322 BC) discovered a number of things about the natural world.

Aristotle came to the conclusion that the earth should be a sphere and that a body in free fall accelerates according to its mass.

Among the early experimenters was the English physician and physicist William Gilbert (1544–1603), who had a special interest in magnetism. He methodically tested the theories and current knowledge through experimentation. Furthermore, he recognized the necessity of repeating an experiment when there is a chance that the outcome may vary. Francis Bacon (1561–1626) at the time held the views that facts seen through empirical means must be the foundation of all research and that any hypothesis is valid to the degree that it derives from these facts. Among the pioneers of the experimental method is also the Florentine mathematician, astronomer, and physicist Galileo Galilei (1564–1642).

Alfred Daniel Hall (1864-1942) was appointed Director of the Rothamsted Experimental Station.

John Bennet Lawes founded Rothamsted laboratory  There he started experimenting with superphosphate fertilizers made of mineral phosphates and bones.

English scientist Joseph Henry Gilbert (1817-1901) and founded, in Rothamsted, the world's first organized agricultural experimental station.

Agronomist Thomas Barlow Wood (1869–1929) and astronomer Frederick John Marrian Stratton (1881–1960) at Cambridge presented one of the earliest experiments on uniformity and demonstrated a method for measuring mistakes in animal nutrition tests.

In 1912, Daniel Hallhired Ronald Aylmer Fisher (1890-1962), a young mathematician from Caius College, Cambridge for extracting information from large masses of data of Rothamsted experiments.

Fisher underlined the importance of repetition as a foundation for calculating error and, in turn, for assessing the strength of the evidence supporting the existence of effects. He introduced the novel idea of randomization and developed a number of randomized design techniques, most notably the

randomized block design, which is now widely applied in field agricultural research. Fisher also emphasized the value of factorial studies, stating that nature favors responses to issues addressed in groups rather than separately. His 1935 book "The design of experiments" contained his most significant contribution to experimental research [5].

**The various concepts and classifications of experiments:**

In Life science, particularly in agriculture, comparative experiments are much more common and important.

Scientific or basic experiments and technology experiments are the two categories into which comparative experiments are divided based on their goals.

•A basic or scientific experiment tries to improve our understanding of reality rather than just using knowledge for practical purposes. It is primarily a cognitive exercise. An experiment in technology seeks to produce knowledge that will be useful in real-world situations.

There are three categories of technological experiments: demonstrative, critical, and preliminary experiments.

•A preliminary experiment is designed to gather information for the development of more important, targeted, precise, and valid tests. It often consists of a large number of treatments and serves an exploratory function. The goal of a critical experiment is to create findings (technologies) that researchers or other users of the study can propose be adopted. A demonstration experiment seeks to confirm and show how critical experiment findings can be used practically to the target population's actual systems.

Critical technological experiments fall into two categories based on the size of the sample: broad-ranging experiments and narrow-ranging experiments.

•A narrow-ranging experiment is one in which the sample consists of a single piece of space and time; a wide-ranging experiment (spatial or temporal) consists of two or more sections of space or time.

**Experiment Process:**

•The first step is to identify and define the research or scientific problem.

•Second stage: Formulation of the scientific hypothesis or research hypothesis.

•Step three: Examining the data that is at hand.

•Fourth phase: Developing the study strategy.

•Step five: Gathering data.

•Step six: Analyzing and interpreting data

•Seventh stage: drawing conclusions that could support, contradict, or refute the initial idea as well as the findings of other studies

•The eighth step involves distributing the report containing the results and presenting them.

**Formulation of the hypothesis:**

•A specific problem, question, or query pertaining to the relationships or connections between the characteristics of these units that can be resolved using the scientific method and the available methods, techniques, and resources is referred to as a scientific problem or research problem related to the units of a target population.

•An idea for a solution to a research problem that is generated from a theory by deductive inference, from reasoning based on observation of occurrences or from the literature, and that permits an empirical confirmation test is known as a scientific hypothesis or research hypothesis.

**Planning of the experiment:**

This step essentially consists of planning the sample, specifically the experiment's structure, planning the actions and procedures needed to carry out the experiment, defining the final statistical model, and planning the statistical analysis steps needed to draw conclusions.

**Conducting the experiment:**

The experiment should be meticulously followed and carried out by the researcher to guarantee adherence to the predetermined plan and to keep track of any unrelated events that might have an impact. In order to prevent the emergence of unsettling extraneous characteristics, which affect the characteristics in a systematic way and cause biased confounding with effects of treatment characteristics, careful consideration should be given to the experimental design and the execution of the experimental techniques for experimental control.

In order to guarantee the identification of potential errors, particularly egregious errors, it is crucial that

data recording be followed by a thorough examination and data criticism.

**Analysis of results:**

It is necessary to employ statistical analysis techniques and processes appropriate to the experiment's goals, consistent and coherent with the chosen experimental design and the associated statistical model defined in the experiment plan.

A preliminary step of data inspection, which includes describing and summarizing the data and using methods to validate the assumptions made by the statistical model, can be helpful in many types of study. The experiment's most obvious indicators may come from this approach, and these may be crucial for guiding the selection of the best statistical analysis techniques.

**Conclusion-**

The experiment is the gold standard for scientific research methodology. The experiment enables the fulfillment of the criteria for obtaining trustworthy knowledge in the scientific method. These specifications call for a procedure that consists of a series of logically connected steps and the observance of characteristics that guarantee the production of accurate and reliable inferences. To ensure unbiased confounding of treatment factor effects with experimental error, sample control is necessary for these features. For the experiment to be successful, the researcher has to be aware of these prerequisites**.**

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# Essential Methods & Tools for Research

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• **Abstract:**

This article describes the different types of research methods. Each research method describes the research method used in the study. Explain the differences between qualitative and quantitative research methods. Since secondary data sources were used in the study, the differences between primary and secondary data sources will also be discussed. Next, we will discuss the research methodology, that is, the actual data collection and data analysis methods.

**Key words : research, methods, tools.**

• **Introduction:**

The data collection is an essential part of the research. In order to collect the requisite data for any theme of research, we have to devise appropriate tools and use suitable measuring techniques, and decide on the relevant attributes of the samples. A research method is a systematic approach to the process of collecting and analyzing data to answer a research question. It is a set of procedures used to gather information and answer a research question. Research methodology is the general approach of the researcher to carry out for the research. The types of research can be classified in many different ways. Some major ways of classifying research include the, Descriptive versus Analytical Research, Applied versus Fundamental Research, Qualitative versus Quantitative Research, and Conceptual versus Empirical Research. Research tool is a specific mechanism or strategy use by the researcher for collect, manipulates, or interprets the data. There are several research tools having varying in design, operation, complexity of features, and interpretation. In certain situations we may select from a list of available tools. In other situations we may find that existing research tools do not suit for our purpose or objective of research and, therefore, we may like to modify them or develop our own tool. Each tool is appropriate for collecting a particular type of data or information which provides itself to a particular type of analysis and interpretation for drawing meaningful conclusions and generalizations. Surveys or Questionnaires, interviews, rating Scales and attitude scales, and tests, are the major data-gathering research tools. Questionnaire' is a commonly used for gathering a variety of data. For data collection, the research tools are used to measure a variable or to collect the information needed to answer a research question. Three different data collection methods are observation, questionnaire and interview. Research methods are the strategies employed by a researcher(s) to answer the research question(s).Research methods are specific procedures for collecting and analyzing data.

• **Most essential frequently used research methods are :**

**1) Surveys:**

A short and easy-to-understand survey allows you to analyze a sample group that is representative of your target market. The larger the sample, the more reliable the results.

There are various types of research methods.

a) Face-to-face surveys are usually one-on-one interviews conducted in high-traffic locations.

b) Telephone surveys are more cost-effective than face-to-face surveys.

c) Postal surveys are a relatively inexpensive way to reach a wide audience.

d) Online surveys typically do not have control over the respondent pool, resulting in unpredictable response rates and unreliable data.

**2) Personal interviews:**

Similar to focus groups, personal interviews involve unstructured, open-ended questions. They typically last about an hour and are usually recorded.

Focus groups and personal interviews provide more subjective data than surveys. The results are not statistically reliable, which generally means they are not representative of a large enough portion of the population.

**3) Focus Groups**:

In a focus group, a moderator leads the discussion within the group using a predetermined set of questions and topics. These sessions take place in a neutral location, usually in a facility equipped with

video recording equipment and an observation room with a one-way mirror. Focus groups typically last 1-2 hours and require at least 3 groups to achieve balanced results.

**4) Observation / Participant Observation:**

Individual responses to surveys and focus groups may not match what people actually do. By videotaping and observing consumer behavior in stores, at work, or at home, we can observe how they purchase or use products. This allows to better understand our customers' usage habits and purchasing patterns.

**5) Experiments.**

Experimental research systematically intervenes in a process and measures the results. The validity of a study depends on the experimental design.

To conduct an experiment, you must be able to change the independent variable, accurately measure the dependent variable, and control confounding variables. Where practical and ethically possible, this is the best way to answer questions of causation.

**6) Secondary Data Analysis / Archival Study:**

Primary research is any original data collected for the purpose of answering the research question itself, such as through surveys, observations, or experiments. However, the secondary data is as follows. It has already been collected by other researchers (as part of government censuses and previous academic studies).

If we are investigating a new research question, you will probably need to collect primary data. However, secondary data is a better choice when we want to integrate existing knowledge, analyze past trends, or identify large-scale patterns.

**7) Mixed Methods (combination of some of the above):**

A mixed methods research design is a procedure for collecting, analyzing, and "mixing" both quantitative and qualitative research methods in a single study to understand a research problem.

**a) Quantitative Research methods:**

This is a type of educational research in which the research decides what to study; asks specific, narrow questions, collects quantifiable data from participants (a large number of participants); analyzes these numbers using statistics; and conducts the inquiry in an unbiased, objective manner.

Examples of quantitative data collection methodologies are -

a) Performance Tests

b) Personality Measures

c) Questionnaires (with closed-ended questions or open ended but transferred to quantitative data)

d) Content Analysis

**b) Qualitative Research method:**

This is a type of educational research in which the researcher relies on the views of participants; asks broad, general questions; collects data consisting largely of words (or text) from participants; describes and analyzes these words for themes; and conducts the inquiry in a subjective, biased manner.

The examples of quantitative data collection methods are-

a) Interviews

b) Open-ended questionnaires

c) Observations

d) Content analysis

e) Focus Groups

• **The six main tools of research :**

Research tools are specific mechanisms or strategies that the researcher uses to collect, manipulate, or interpret data. Six general tools of research:

**1) The library and its resources:**

Information can be access Quickly and Efficiently by:

• Library Catalogs

• Indexes and Abstracts

• Reference Librarian

• Library Shelves

**2) The computer and its software:**

The Computer and Its Software as a Tool of Research are

• World Wide Web (WWW)

- Web pages
-URL (Uniform Resource Locator)
-Web browser
-Web link
• Electronic Mail
• News

**3)   Techniques of measurement as a tool of Research:**

Measurement: Limit everyone's data phenomena to be able to interpret this data and ultimately compare it to specific qualitative or quantitative criteria - substantial or immaterial.

*Substance measurement = A measured thing that has physical substance.

*Intangible measurements = exist only as concepts, ideas, opinions, emotions, or other intangible entities.

**There are Four Scales of Measurement:**

**1)  Nominal Scales of Measurement:**
• Name and measure data
• Things can be measured in nominally infinite ways.
• Simplification
• Split your data into separate categories.
• Statistical methods = mode, percentage, chi-square test

**2)  Ordinal Scales of Measurement:**
• Think in terms of symbols (>; <)
• Data can be sorted by rank.
• Statistical methods = median, percentile rank, Spearman rank correlation.

**3)  Interval Scales of Measurement:**
• Units of measurement are equal.
• Set zero point arbitrarily
• Rating scales such as questionnaires are assumed to be interval scales.
• Statistical methods = mean, standard deviation, Pearson product moment correlation.

**4)  Ratio Scales of Measurement:**
• Characterized by equal units of measurement (similar to interval scales).
• There is an absolute zero point (0 = the measured quality is completely absent).
• Values can be expressed as multiples and fractions.
• Ratios are actual ratios (e.g. standards)
• Relatively rare outside of the natural sciences.

**In these Four Scales of Measurement:**
• Nominal scale: One object is different from another.
• Ordinal scale: one object is greater, better, or better than another.
• Interval scale: One object is many units (degrees, inches) larger than another object.
• Ratio scale: one object is many times larger, brighter, taller, or heavier than another object.

**4) Statistics as a Tool of Research:**
• Main features of statistics:
1. Data description and
2. Draw conclusions from the data
Descriptive statistics summarize the general characteristics of the data obtained.
• Inferential statistics help researchers make decisions about data.

**5) The Human Mind as a Tool of Research:**

**a) Critical Thinking:**
Critical thinking = evaluating the accuracy and value of arguments. It can take many different forms.
- Verbal reasoning
- Argument analysis
- Decision making
- Critical analysis of previous research

**b) Deductive Logic:**
Deductive logic begins with one or more premise statements or assumptions that the researcher initially believes to be true. It is useful for generating research hypotheses and testing theories.

**c) Inductive Reasoning:**
Inductive reasoning starts by observing a particular event (i.e., observing a sample and drawing conclusions about the population from which the sample was drawn) in order to reason about an entire class of objects or events.

**d) The Scientific Method:**
The scientific method is the process of objectively establishing facts through testing and experimentation. The basic process involves making an observation, forming a hypothesis, making a prediction, conducting an experiment and finally analyzing the results.
The scientific method uses a series of steps to establish facts.
Following steps are use in scientific method:

**1. Define a Question to Investigate:**
Researcher can conduct their research, make observations and collect data. The observations and data lead them to establish the facts.

**2. Make Predictions:**
Based on the research and observations, researcher will often come up with a hypothesis. A hypothesis is a possible answer to a question**.**

**3. Gather Data:**
Evidence is needed to test the prediction. There are several strategies for collecting evidence, or data. Researcher can gather their data by observing the natural world, performing an experiment in a laboratory, or by running a model.

**4. Analyze the Data:**
Researcher organizes their data in tables, graphs, or diagrams. If possible, they include relevant data from other sources. They look for patterns that show connections between important variables in the hypothesis they are testing.

**5. Draw Conclusions:**
Based on whether or not their prediction came true, researcher can then decide whether the evidence clearly supports or does not support the hypothesis.

**e) Theory Building method:**
Theory-building research carefully defines concepts, states the domain, explains how and why relationships exist, and then predicts the occurrence of specific phenomena. After the prediction, it typically gathers evidence to see if the phenomena occur.

**6) Language as a Tool of Research:**
• Language enables effective thinking.
• Words stimulate thinking about:
- Reduce the complexity of the world, Enables abstraction of the environment, Strengthen our thinking skills,
- Facilitates generalization and drawing of conclusions in new situations.
• Communicate effectively through writing.
• Say exactly what we want to say.
•Always keep our main goal in mind.
•Outline what we are going to discuss.
• Use headings and subheadings to organize your ideas into general and more specific categories.
•Use filler phrases, sentences, or paragraphs to help the reader understand our flow of thought.

**• Need for research tools for research:**
All researchers, no matter what kind of research they are doing, focus on multitasking, achieving good results, and using their time wisely. Doing all of this requires a well-planned and organized system. To do this, all researchers need research tools. Using the tools that work best for researchers can make this task easier.
Market research tools help researchers write project proposals, reports, academic papers, and articles by helping them avoid language errors, cite sources, network, and find journals to publish in.

**• Conclusion:**
There are many tools that are perfect for researchers. If we are researchers looking for the best tool for our needs, we should take the time to consider what features we need.
These tools are great for research. Each research tool has common and unique features. In this situation, it is important to know what options and what features are available

If we want to measure something or test a hypothesis, we can use quantitative methods. If we want to explore ideas, thoughts, and meaning, we can use qualitative methods.

If we want to analyze large amounts of easily available data, we can use secondary data. Collect primary data when we want to generate data for a purpose and control how it is generated.

If we want to establish causal relationships between variables, we must use experimental methods. If we want to understand the characteristics of the object of study, we should use descriptive methods. There are various research tools that can be used in different research fields.

Literature search databases (JSTOR, IEEE Xplore, Google Scholar), statistical software (SPSS, SAS), etc., data collection tools (surveys, questionnaires, interviews, and data collection observations), laboratory equipment and software (microscopes, spectrophotometers, DNA sequences, and software for DNA analysis or image processing), data visualization tools (using Microsoft Excel researchers can create data). (Visual representation of data), qualitative data analysis software (software such as NVivo, ATLAS.ti, and MAXQDA are used to analyze qualitative data such as interviews, focus groups, and text data);

These are numerous research tools used by researchers.

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# Role Of Computer In Research Methodology

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**Abstract:**
Computers are an indispensable tool for research, whether for academic or commercial reasons. Computers are now used extensively in many areas of scientific inquiry, from genetic engineering to astrophysics. Computers with internet connections paved the groundwork for a globalized information portal known as the World Wide Web. Researchers can perform massive-scale study via the World Wide Web. Several programs and software have made it easier for us to computerize our research. This module discusses a variety of computer software applications and technologies used in research operations such as data collection and analysis. The use of computers to analyze complex data has made intricate research designs viable. Electronic computers have now become an integral part of the Discussed in terms of research tasks such as data collecting and analysis. The use of computers to analyze complex data has made difficult research designs feasible. Electronic computers have now become an essential part of research studies in physical and behavioural science, as well as in humanity. Research students in the physical and behaviour. Computers were invented for the purpose of using powerful calculators, a service that is still crucial in research. Computers are capable of processing massive amounts of data. Computers can be used for statistical programming, modelling, and spatial mapping. Objectives of the study are to know various steps involved in research process. Role of Computers in Research Publication and Introduction of Analysis Tools used in research process.

**Key Words**: computer, data analysis, application, tools, research process

## Introduction
Computers are an indispensable tool for research, whether for academic or commercial reasons. Computers are now used extensively in many areas of scientific inquiry, from genetic engineering to astrophysics. Computers with internet connections paved the groundwork for a globalized information portal known as the World Wide Web. Researchers can perform massive-scale study via the World Wide Web. Several programs and software have made it easier for us to computerize our research. The research student in this age of computer technology must be exposed to the methods and use of computers a basic understanding of a manner in which a computer works helps a person to appreciate the unity of this powerful tool Computers started for the use of powerful calculators and that service is important to research today. Huge amount of data can process with the help of computer's. Statistical programs, modelling programs and spatial mapping tools are all possible use of computers..

## Communication
Building knowledge through research necessitates communication among specialists in order to identify new areas for investigation and to debate results and theories. Prior to the invention of computers, this was performed using papers and workshops. The world's specialists can now communicate through web chats or email. Information can be shared in a variety of methods, including virtual conferences.Researchers can take computers anywhere, making it easier to do field study and gather vast amounts of data. The portability of computers allows for new fields of research to be conducted in remote places or communities. Social media sites provide a new platform for interacting with society and gathering information.

## Steps in Research Process
 The research process consists of a sequence of acts required to carry out research work properly. The sequencing of these processes is mentioned below.
1. Formulating research problems.
2. Conduct extensive literature survey.
3. Developing the Hypothesis.
4. Planning the research design.
5. Determining sample design.
6. Data collection 7. Project execution
 8. Data analysis

9. Hypothesis testing

10. Interpretation and generalizations

11. Preparation of reports or presentations.

   Computers are indispensable throughout the research process. The role of computer becomes more important when the research is on a large sample data can be stored in computers for immediate use or can be stored in auxiliary memories like floppy disc, compact disc, universal serials, or memory cards so that the same can be retrieved letter the computer assess the researchers throughout different phases of the research process.

**Phases of Research Process**

There are five major aspects of the research process.

1. The conceptual stage

2. Design and Planning Phase

3. Empirical phase

4. Analytical stage

5. Dissemination Phase

   Computers play an important role in research and development of electronic products, particularly computers. Given the additional inputs to this activity, problems that were previously unsolvable owing to the number of competitions involved can now be addressed precisely and quickly using computers. Computers are unquestionably one of the most flexible and innovative developments of modern technology. Today, people utilize computers in practically every aspect of their lives. They are no longer just large boxes with flashing lights whose sole purpose is to perform high-speed arithmetic, but they also use studies in philosophy, psychology, mathematics, and linguistics. To produce output that minimizes the human intellect, the sophistication of computer technology has bridged. It won't be long before it's hard to discern whether you're speaking with a human or a machine; the advancement of computers is astounding.

**Computer applications**

   Computers are widely used for many purposes educational commercial industrial administrative transport medical social financial and several other organizations are progressively relying on the help of computers to some degree or the other, even if our activity does not entail the use of computers.Computers have an impact on our daily lives. Computers are used not only in numerical applications, but also in non-numerical applications, such as proving theorems, playing chase, and preparing menus. Without computers, matrimonial maths and so on could not have accomplished a variety of tasks. For example, man could not have landed on the moon or launched satellites; we could not have created 100-story buildings, high-speed trains, or planes. The following tables show some of the main applications and uses of computers.

| Application in | Some of the various uses |
|---|---|
| 1.Education | Provide a large data Bank of information |
| | Aid to time table ling |
| | Assist teaching and learning processes |
| | Provide students profiles |
| | Assist in career guidance |

   The computer has emerged as one of the most useful research instruments in recent times. Computers are well-suited for data analysis in major research projects. Researchers must be concerned with enormous amounts of data storage, faster retrieval when needed, and data processing using diverse approaches. Computers are extremely useful in all of these processes. The use of apart expanded expediting the study work has decreased. Human drudgery was reduced, and research activity was improved. Researchers in economics and other social sciences have discovered that electronic computers are now an indispensable part of their study equipment. Computers are capable of

performing several statistical calculations fast and efficiently. Calculation of means Standard deviations, correlation coefficients, t-tests, and multiple regression factor analyses and various non-parametric analysis are only a few of the applications and sub-programs that are available at practically any computer centre. Similarly, tools for linear programming multivariate analysis are accessible on the market. In summary, software packages are ready for the different simple and difficult analytical and quantitative procedures that research normally makes use of techniques involving the trial and error process are frequently used in research methodology because they involve a lot of calculations and repetitive work. A computer is best suited for such techniques because it reduces the drudgery of researchers while also producing the final results quickly. Computer data analysis while consulting with computer centres and reading the element literature must be aware of the following steps

1. Data organisation and coding
2. Storing the data in the computer
3. Selection of appropriate statistical measures or techniques
4. Selection of appropriate software package
5. Execution of the computer program

**Limitations of Computer-Based Analysis**

1. Computerized analysis necessitated the establishment of a complex system of data monitoring, collection, and feeding, all of which took time, effort, and money; thus, computer-based analysis may not be cost effective in the case of small enterprises.

2. Various atoms of detail that are not particularly sent to the computer main gate have gone missing.

3. The computer does not believe it can only execute the commands of a thinking person; if poor data or 40 programs are entered into the computer, data analysis may be ineffective, and the expression garbage in, garbage out accurately describes these limitations.

**Computers in Research**

The research procedure can also be done using computers. Computers are a very handy and crucial instrument for processing large quantities of samples. It features numerous storage devices, including compact disks and supplementary memories. Data can be used from these storage devices and then retrieved later. There are several processes required to carry out research efficiently, as well as the ideal sequencing of these steps in the research process. This data can be used at many stages of the study process. Scientific research uses a variety of computer programs. Some of the most essential applications utilized in scientific research are data storage, data processing, scientific simulations, instrumentation control, and knowledge exchange.

**Data Storage**

Experimentation is the foundation of scientific investigation. Scientific experiments in any of the natural sciences generate a large amount of data, which must be kept and evaluated in order to draw key findings, validate or reject ideas. Computers connected to experience apparatuses directly record data as it is generated and subject it to analysis using specially designed software. Data can be stored in SPSS data files, Lotus spreadsheets, Excel spreadsheets, DOS text files, and other formats

**Data Analysis**

The use of specially designed algorithms implemented by computers allows for the analysis of massive amounts of statistical data. This makes the incredibly time-consuming work of data analysis to be matter of a few minutes. Computers have enabled the sequencing of the entire human genome in genetic engineering. Data collected from many sources can be stored and retrieved using computer networks set up in research labs, making collaboration easier.

**Scientific Simulations**

Simulations are one of the most common applications for computers in pure scientific and engineering endeavours. A simulation is a mathematical representation of a problem and a virtual investigation of its potential solutions.

**Instrumentation Control**

Most advanced scientific instruments include their own on-board computer, which may be programmed to perform numerous activities. Knowledge Sharing via Internet .Computers, through the Internet, have created a whole new way to distribute knowledge. Today, everyone may access the most recent research articles, which are made available for free on websites. The Internet has enabled the exchange of knowledge and collaboration, allowing for international cooperation on scientific endeavours. SPSS is a statistical analysis tool that is used during the research process. SPSS is the most

popular statistical tool. SPSS stands for Statistical Package for the Social Sciences. It provides all analysis facilities, including the following and many more

- Provides Data view & variable view
- Measures of central tendency & dispersion
- Statistical inference
- Correlation & Regression analysis
- Analysis of variance
- Non parametric test
- Hypothesis tests: T-test, chi-square, z-test, ANOVA, Bipartite variable….
- Multivariate data analysis
- Frequency distribution

Data exposition by using various graphs like line, scatter, bar, histogram, Pie chart

**Data Analysis Tools:**

**Spreadsheet Packages**

A spreadsheet is a computer application that functions similarly to a paper worksheet. It shows many cells that collectively form a grid of rows and columns, with each cell having either alphanumeric text or numeric data. Microsoft Excel is popular spreadsheet software. Other spreadsheet packages include Lotus 1-2-3Quattro Pro, Javelin Plus, Multiplan, VisiCalc, Supercalc, and Plan Perfect. Presentation Software .A presentation program is a computer software package that displays information, typically in the form of a slide show. It normally has three major functions: an editor that lets text to be added and formatted, a way for entering and altering graphic pictures, and a slideshow system for displaying material. Microsoft PowerPoint, Lotus Freelance Graphics, Corel Presentations, and Apple Keynote are some of the presenting products available.

**Word Processor Packages**

A word processor (also known as a document preparation system) is a computer application that is used to create any type of printed material (including writing, editing, formatting, and printing).Word processing systems include Microsoft Word, WordStar, WordPerfect, AmiPro, and others.

**Conclusion**

Computers are useful instruments that make the research process easier and faster, with accuracy, dependability, and pure errors. The programmer or computer operator should be well-versed in the capabilities and imitations of software used to improve computer performance. Computers have made it easier for humans to solve problems. A computer can do a wide range of tasks quickly and accurately. Today, life is impossible without computers. It is employed in Schools, Colleges and has become vital part of every business or profession. Computers are also used extensively in research. The use of computers in scientific research is so widespread that it is difficult to imagine a search project without one. Many research investigations require the use of a computer, especially those involving complex computations and data analysis. In scientific research, computers are employed at all stages, from investigation to proposal and submission of findings.

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# The Introduction To Research Ethics

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- **INTRODUCTION:**

Ethics are the moral principles that govern a person's behaviour, Research ethics may be referred to as doing what is morally and legally right in research.  They are actually norms for conduct that distinguish between right and wrong, and acceptable and unacceptable behaviour.

to The Research Excellence Framework, 2014, research is 's process of Investigation leading to new insights, effectively shared Research is a multi-stage process. Ethics are central to the research process. Researchers need to take care of various ethical issues at different levels of this process. The reality is there can be ethical concern at every

- **STEP OF THE RESEARCH PROCESS:**

Even though few aspects of research ethics have been set out in legislation, mental values mostly govern the conduct of research, Ethical considerations have been paining paramount importance across the research community. With an increase in the public concern about the limits of the query and legislative changes in human rights and date protection, the ethical considerations have come to the forefront in social research With the advent of technology more and more ethical issues have been assign in the field of research Despite dealing mostly with human and animal participants, different branches of social sciences deal with different techniques and ethical issues. Besides decisions to be informed by shared values and experiences, ethical guidelines may enable the researcher's individual ethical judgments in addition to the professional ethics

Being one of the most diverse countries in the world researchers in India have to work within a variety of cultural, political, economic and religious settings. Researchers must possess adequate knowledge regarding the characteristics of ethical problems in social research. Apart from the general ethical tenues.

- **THE RESEARCH PROCESS AND ETHICS:**

Highlighting the multi-stage nature of research, The prevalence of ethical concerns at each step. The studies dealing with personal data are considered most sensitive in nature. According to Resnik (1998) research ethics are the common denominator for researchers' relations with respondents and colleagues. Researchers are themselves responsible for the ethical conduct of their research. They have to take care of all the ethical issues at every stage of the research process.

The material available on the internet also gives rise to a number of ethical issues. According to Jensen (2002), "This is, in part, because the status of computer-mediated communication as a social context on a scale from the public to private - is unresolved." Depth, the strength of qualitative research, also "poses serious issues for the ethics of research. Many universities across the world have drafted their own ethics policy governing research involving human and animal participants. Apart from that, a good number of the researchers and institutions follow Social Research Association's ethical guidelines, first drafted in 1980, with a revised draft in 2003.

The researchers have to take care of various obligations during the research process. They must ensure that their research is conducted with honesty, objectivity and integrity. The researcher must seek consent from the participants for their participation. They must respect people, their cultures, values, religions, economic status and so on. Researchers have an obligation to take care of the confidentiality andpersonal information or identity of the participants as per her choice. Researchers should avoid experiments which may pose a threat to both the participants and the researchers themselves. Apart from the participant's, the researcher has also an obligation towards society, her colleagues of other researchers and funders of the project.

- **PARTICIPANTS' RIGHTS EXCLUSIVE RIGHT TO GIVE CONSENT RIGHTS TO CONFIDENTIALITY, SAFETY, AND SECURITY:**

The participants have the exclusive right to give consent to participate, withdraw from, or refuse to take part in research projects. Participants have right to seek confidentiality and stop personal

information or identifiable data from publishing or sharing. They have right to seek their safety and security. Whenever required, the data should be kept secure and participants should not be exposed to unnecessary or disproportionate levels of risk.

• **RESEARCHER-PARTICIPANT ETHICS:**

Importance of understanding ethical research practices

Different types of research methods and their ethical guidelines

1. Research Ethics: Researcher-Participant

Conducted ethically, research is a public trust. So, researchers must fully understand the theories and policies designed To guarantee upstanding research practices.

Different types of research methods need a different set of ethical guidelines. To make it easy to understand, let's divide the research ethics simply into two groups; Research-Participant Ethics and General Ethics. We will enlist different ethical issues arising at various stages of the research process. The researcher has a primary responsibility towards the participants and other researchers.

Informed consent is the prime responsibility of the researcher. A standard procedure in professional codes of ethics is 'informed consent' (Resnik 1998: 133). Seek consent for the participation from people. In the case of children and few other exceptional cases, the informed consent of participants, as well as their guardians must be obtained.

2. The researcher must reveal all the risks associated with the research to the participants. should highlight all the negative and positive aspects of the research during the consent process. Aim, objectives and nature of the research topic.

3. Participants must be given an option of rejecting data-gathering devices like camcorders, audio recorders etc.

1. Researchers are expected to consider ethical implications of their research.

2. To uphold the ethical standards in the research process, the researcher must accept and respect the principles of integrity, honesty, objectivity and openness.

3. The knowledge gap between the researcher and the participants must be considered.

4. The privacy, anonymity and confidentiality of the participants and data must be given due consideration (Jensen, 2002). As professional guidelines and some form of a cultural consensus are still being negotiated, research projects need to consider carefully issues of anonymity, confidentiality, and 'informed consent.

It's also the Responsibility of the researcher to protect participants from the risks arising from their research.

6. The researcher should protect and promote the rights and interests of the participants.

7. The researcher must take care of their own safety.

8. She must take care of cultural, religious, economic, psychological, spiritual, physiological, biological, political, social and other issues of the participants.

• **SPECIFIC GUIDELINES FOR RESEARCHERS:**

Avoiding plagiarism, fabrication, and falsification.

Ensuring transparency, accountability, and adherence to regulations

1. General Ethics:

Apart from the above-listed guidelines, a researcher needs to take care of various other ethical issues at different stages of the research process as follows:

1. As some topics are controversial in their nature, so it becomes the prime duty of the researcher to check whether the topic to be studied has innate ethical ramifications. Thus, before finalizing the topic, the ethical implications of the topic must be given a thought.

2. Ethics play a paramount role in the studies involving direct human contacts. So, the effects of the research on subjects must be given due consideration. Harmful research should be avoided.

3. Researchers conducting studies involving human subjects should clearly describe and justify the research protocol in the research design.

1. Avoid any fabrication, falsification and misrepresentation of data or result. Don't indulge in the manipulation of h

videos or other forms of illustrated work. The researcher should report the data honestly. Research misconduct is a sin

2. The author should retain the raw data as they may be asked for the data at the time of editorial review

3. Act sincerely and don't break promises. Avoid discrimination on the basis of demography or on any other condition.

4. Carelessness and negligence must be avoided. The researcher should be critical of her own work and must keep a recoating's. Be open to criticism.

5. Both humans and animals must be handled carefully.

6. Both negative, as well as positive findings, revealed during the course of research should be reported

7. Ensure transparency and accountability in all the research activities.

People who anyhow helped the researcher in conducting the research must be properly acknowledged. And now a days Most of the young researchers send the same manuscript to different reviewers or publications at the same time. It's unethical. Avoid such practices. Resubmitting an already published research paper or article with minor changes or under a different title to a journal violates, "international copyright laws, ethical conduct, and cost-effective use of resources. The final report must clearly declare the sponsor of the study, institutional affiliations and conflicts of Interest. The findings of the research must be disseminated in an easily understandable report.

• **ETHICS COMMITTEES IN INDIA:**

Lack of research ethics committees in Indian universities

Importance of establishing committees at departmental or faculty levels

1. Ethical Issues in India

Mostly matters of research ethics differ from method to method. Most importantly, ethics also vary from place to place. Forexample; A Christian lady in white indicates a bride, while a Hindu lady in white indicates a widow. In most of the camcultures in India vary from state to state, and even from city to city. So, researchers should have a depth knowledge ofcultures and other things of the place, they are working in. during the study Indian researchers should give utmost importance to the cultural diversity and religiosity of the country. They must work within a framework suitable for all the customs, traditions, languages, castes, creed, colours, classes, region etc.They must work for the promotions of all the cultures, religions etc., not the other way round. During the research, the researchers must keep in mind the wide economical, knowledge and technological gap between the people of India.

1. Ethics Committees

Indian universities lack in the making of research ethics committees. Researchers have no other option but to rely on their own common sense to eliminate and minimize various crucial ethical issues. Therefore, need for a common policy or a common framework both at domestic as well as national level assisting Indian researcher in addressing the ethical issues is cardinal. Keeping in mind the aforementioned concerns, following suggestions may prove to be fruitful:

1. As there is a difference in the nature of issues arising in various methods of research, all the universities in India must be equipped with research ethics committees at the departmental level or faculty level.

• **RECOMMENDATIONS FOR ETHICAL COMMITTEES:**

Submission of research protocols for consideration Promoting awareness, acting as mediators, and monitoring ongoing studies

1. Research protocols may be submitted to such committees for consideration, guidance, improvement and approved before the commencement of the study.

2. These committees may help to promote the awareness regarding the do's and don'ts of the research.

3. The committees may act as the mediators and advisor in disputed cases.

1. The ethical issues have shown an increase with an advent in technology, as witnessed, these committees may provide advice on all such matters.

2.Such ethical committees may encourage an organizational research culture based upon defensible standards of research practices.

3. These committees must be committed to high quality, transparent and accountable research ethics throughout India.

4. The committees may also monitor the progress of the ongoing studies.

5. on the other side, the researcher may also update the committees regarding the events and issues and status of the research.

6. At last, a copy of the thesis or research paper may also be submitted for the perusal of these committees.

- **GLOBAL PERSPECTIVE ON RESEARCH ETHICS:**

Mention of universities drafting ethics policies Reference to the Social Research Association's ethical guidelines

if we go through history of Research ethics guidelines there were no such evidence of proper guidelines or set of rules in the field of research ethics before the world war2nd. For the first time the most important declarations of Hilinski and Nuremberg code were setup after the world war 2nd

The Nuremberg Code is a set of research ethics principles for human experimentation set as a result of the Subsequent Nuremberg Trials at the end of the Second World War. No ethical guidelines for research existed in the major Allied countries before Nuremberg Code

Nuremberg Code:

1. Voluntary human consent is essential
2. Experimental results should result in good for society
3. Anticipated results should justify the experiment
4. Avoid all unnecessary physical and mental suffering
5. No experiment if there is a chance of death/disability
6. Minimize risk of subjects
7. Proper preparations and facilities to protect subjects
8. Experiments conducted only by qualified persons
9. Subjects can withdraw at anytime
10. Terminate experiment if results are known or with best judgement.

- **DECLARATION OF HILINSKI:**

In 1961, public opinion around the world was shocked by the thalidomide scandal. 2,000 children died and 10,000 chi Seriously disabled.

Government authorities were then required to take action and make regulatory arrangements to oversee the testing of

In 1964, the world medical association (WMA) developed and indeed continues to review and adapt the declaration of Helsinki as a guide for performing research in human beings

- **PRINCIPLES DECLARATION OF HELSINKI :- BASIC PRINCIPLES**

1. Conform to accepted scientific principles.
2. Design formulated in experimental protocol, reviewed by IEC.
3. Conducted by qualified and trained persons.
4. Importance in proportion to inherent risk.
5. Assessment of risks vs. benefits.
6. Safeguard subject's integrity (privacy).
7. Abstain unless hazards are predictable.
8. Preserve accuracy when publishing. 9. Adequately inform or right to withdraw.
10. Obtain true informed consent in writing.
11. Reliance on legal guardian.

A global perspective on research ethics involves the development and implementation of ethical guidelines wide policies by universities and research organizations worldwide. Many universities recognize the importance of establishing ethical standards to govern research activities and protect the rights and well-being of participants. Universities often draft comprehensive ethics policies that outline the principles and standards researchers must adhere to when conducting studies. These policies typically cover issues such as informed consent, confidentiality, data management, and the proper treatment of human and animal subjects in research. The goal is to ensure that research is conducted with integrity, transparency, and respect for ethical principles. In addition to individual university policies, various professional associations and organizations play a role in shaping research ethics guidelines. The Social Research Association (SRA) is one such entity that provides ethical guidelines for social researchers. These guidelines help researchers navigate ethical challenges specific to the social sciences, promoting responsible and ethical research practices within this field. American psychological association and many others working rigorously in this field Researchers are expected to be aware of and comply with both institutional and professional ethical guidelines toto uphold the highest standards of research integrity. This global perspective on research ethics emphasizes the importance of a unified commitment to ethical conduct in research, fostering trust in the scientific community and ensuring the responsible advancement of knowledge.

• **CONCLUSION :**

Key points discussed in the presentation Obligations of a researcher and ethical considerations The presentation on research ethics begins by defining ethics as the moral principles guiding behaviour in research. It in pervasive nature of ethical concerns across the multi-stage research process, acknowledging the Interplay between legal and moral aspects. The impact of technology on ethical issues, especially in communication research, is highlighted. Global prospect research ethics, including university policies and ethical guidelines, are discussed, with a specific focus on the researcher's and participants' rights. The ethical ethos is explored, emphasizing the researcher's responsibility for the safety, dignity, rights, and well-being of participants Researchers are obligated to conduct research with honesty, objectivity, and integrity, respecting cultural diversity and ensuring confidentiality. Participants have exclusive rights to consent, confidentiality, safety, and security. The presentation delves into research-participant ethics, distinguishing between informed consent, risks, privacy, and other considerations. General ethics in research are discussed, covering controversial topics, harmful research avoidance, authorship, and data management. Specific guidelines for researchers, such as avoiding plagiarism and ensuring transparency, are outlined. Ethical issues in India, with a focus on cultural diversity and economic gaps, are also addressed. The lack of research ethics committees in Indian universities is highlighted, leading to recommendations for their establishment at departmental or faculty levels. These committees are proposed to play crucial roles in promoting awareness, acting as mediators, and monitoring ongoing studies.

In conclusion, I would say the paramount importance of ethical conduct in research, guiding researchers from the initial stages of planning to the dissemination of findings. It is the dual responsibility of researchers and participants, with a focus on respecting rights and ensuring the well-being of all involved parties. The need for clear guidelines, both at a global and local level, is evident, and the establishment of research ethics committees in Indian universities is proposed as a significant step toward addressing and minimizing ethical concerns. Following the proper research ethics encourages a culture of transparency, accountability, and adherence to ethical principles, contributing to the overall integrity and credibility of research endeavours.

# Uses of SPSS in Interdisciplinary/Social Sciences Subjects: Review/Briefing on Research Method

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## -Introduction to SPSS.

SPSS, which stands for Statistical Package for the Social Sciences, is a software package used for statistical analysis. It was originally developed by IBM in 1968 and is widely used in various fields, including social sciences, business, and health sciences.

SPSS provides a graphical user interface and a command-line syntax for statistical analysis. It allows users to perform a wide range of statistical analyses, including descriptive statistics, inferential statistics, and data visualization. Users can input data into SPSS, manipulate and clean the data, and then conduct statistical tests to explore relationships, patterns, and trends within the data.

SPSS is widely used in academic research, market research, and various industries where data analysis and statistical interpretation are essential. Over the years, IBM has continued to update and enhance the SPSS software to meet the evolving needs of researchers and analysts.

## Qualitative Research-

Qualitative research is a methodological approach used in social sciences and other fields to explore and understand individuals' experiences, perspectives, and behaviors. Unlike quantitative research, which focuses on numerical data and statistical analysis, qualitative research relies on non-numerical data such as interviews, observations, and textual or visual materials.

## Data Collection Methods:

Interviews: Researchers conduct one-on-one or group interviews to gather in-depth information from participants.

**Observations:** Researchers observe and document behavior, interactions, or events in their natural settings.

**Focus Groups:** A group of participants discusses a particular topic under the guidance of a researcher.

**Textual and Visual Analysis:** Analyzing written or visual materials, such as documents, photographs, or videos.

## Open-ended and Exploratory:

Qualitative research is often exploratory and allows for flexibility in the research process. It aims to uncover new insights and patterns rather than testing predetermined hypotheses.

## Rich, Descriptive Data:

The data collected in qualitative research is often rich and detailed, providing a nuanced understanding of the subject under study.

## Subjective Interpretation:

Researchers play an active role in interpreting the data. They acknowledge their own perspectives and biases, contributing to the subjective nature of qualitative research.

## Sampling:

Qualitative research often involves purposive or snowball sampling, where participants are selected based on specific criteria or recommendations from existing participants.

## Ethical Considerations:

Researchers must consider ethical issues related to informed consent, confidentiality, and the well-being of participants.

## Quantitative Research-

Quantitative research is a systematic empirical investigation in which data is collected, analyzed, and interpreted in a numerical form. This type of research is often used to answer research questions or test hypotheses by examining the relationships between variables.

**Research Design:** Quantitative research typically follows a structured research design that involves the collection and analysis of numerical data. Common research designs include experiments, surveys, and observational studies.

**Data Collection:** Quantitative researchers use structured methods to collect data, such as surveys, experiments, or measurements. The data collected is often in the form of numerical values, allowing for statistical analysis.

**Variables:** In quantitative research, variables are measured and analyzed. These variables can be independent (manipulated) or dependent (measured in response to the manipulation). The relationship between variables is a key focus of quantitative research.

**Sampling:** Researchers use sampling techniques to select a subset of participants or elements from a larger population. This subset should be representative of the population to ensure the generalizability of findings.

**Statistical Analysis:** Quantitative data is analyzed using statistical methods. Descriptive statistics (such as mean, median, and standard deviation) summarize the main features of the data, while inferential statistics (such as t-tests, ANOVA, regression) help draw conclusions and make predictions about the population based on the sample data.

**Objectivity and Reliability:** Quantitative research aims for objectivity and reliability. The research process and data analysis should be transparent and standardized, allowing other researchers to replicate the study and verify the findings.

**Generalizability:** The goal of quantitative research is often to generalize findings from a sample to a larger population. This requires careful consideration of the sampling process and statistical techniques used.

Quantitative research is commonly employed in various disciplines, including psychology, sociology, economics, education, and natural sciences. Researchers often use a combination of both quantitative and qualitative methods in mixed-methods research to gain a more comprehensive understanding of a research problem.

- **Working with data editor-**

SPSS (Statistical Package for the Social Sciences) is a software package used for statistical analysis. The Data Editor in SPSS is a spreadsheet-like interface where you can enter, manipulate, and manage your data. Entering Data:

Opening Data Editor:
Entering Data:
Managing Variables:
Variable Names and Types:
Adding Variables:
Data Transformation:
Recoding Variables:
Compute Variable:
Data Cleaning:
Missing Values:
Sorting and Filtering:
Descriptive Statistics:
Frequencies:
Descriptive:
Charting Data:
Histograms:
Scatterplots:
Saving Data:
Saving Dataset:
Exporting Results:
Analyzing Data:
Running Statistical Tests:
 "Analyze"Variety of statistical tests like t-tests, ANOVA, regression, etc.
**Syntax Mode:**
These are just a few basic tasks you can perform in SPSS's Data Editor. Depending on your specific needs, you may need to explore more advanced features and analyses provided by SPSS.

• **SPSS viewer.**

The term "SPSS viewer" might refer to different things depending on the context. Here are a few possibilities:

Data Viewer: SPSS has a Data Viewer window where you can view and edit your dataset. It displays your data in a spreadsheet-like format. To open the Data Viewer, you can go to the "View" menu and select "Data."

**Output Viewer:** After running analyses in SPSS, the results are displayed in the Output Viewer. This viewer presents the statistical output, tables, and charts generated from your data analysis. You can open the Output Viewer by going to the "View" menu and selecting "Output."

**Chart Viewer:** If you create charts or graphs in SPSS, they are typically displayed in the Chart Viewer. You can open the Chart Viewer to view and customize your charts by going to the "Graphs" menu and selecting "Chart Builder" or "Legacy Dialogs."

**-SPSS Modules.**

Here are some common modules in SPSS:

**Base Module:**

The core module that provides basic statistical analysis tools.

**Regression Module:**

Used for linear regression, logistic regression, and other regression analyses.

**Advanced Statistics Module:**

Offers more advanced statistical procedures, such as factor analysis, cluster analysis, and discriminant analysis.

**Custom Tables Module:**

Allows users to create customized tables and charts for data presentation.

**Categories Module:**

Used for categorical data analysis and provides tools for working with categorical variables.

**Complex Samples Module:**

Designed for analyzing data from complex sample designs, such as surveys with stratified sampling.

**Conjoint Module:**

Used for conjoint analysis, a technique to understand customer preferences in product or service design.

**Exact Tests Module:**

Provides exact tests for small sample sizes or situations where exact p-values are required.

**Forecasting Module:**

Includes tools for time series analysis and forecasting.

**Neural Networks Module:**

Used for building and testing neural network models.

**Bootstrapping Module:**

Enables the use of bootstrapping techniques for estimating standard errors and confidence intervals.

**Missing Values Analysis Module:**

Helps in handling and analyzing missing data.

**Amos (Analysis of Moment Structures) Module:**

Used for structural equation modeling (SEM).

**-Typical SPSS Program flow.**

In SPSS (Statistical Package for the Social Sciences), the typical program flow involves a series of steps to load data, manipulate and analyze it, and finally, produce output. Here's a general outline of a typical SPSS program flow

**-The four windows data editor.**

In IBM SPSS Statistics, the Data Editor is the interface where you can view and manipulate your data. The Data Editor is typically divided into four main windows: Data View, Variable View, Output Viewer, and Syntax Editor. These windows help you manage your data, define variables, view analysis results, and write syntax commands. Here's a brief overview of each window

-Variables view Windows.

-Transforming data.

-The basic data analysis.

-Frequencies.

The "Frequencies" procedure is a fundamental tool for exploring and summarizing the distribution of variables in your dataset.

-Using data editor.

• **Regression Analysis.**

Multiple Linear Regression:

If you have more than one independent variable, you can perform multiple linear regression:

**-Basic Statistical Concepts.**

• Research in behavior science.

• Qualitative research.

• Quantitative Research.

• Hypothesis Testing.

• Type I and type II  errors.

• Significance Level(p-value)

• One- tailed and Two-Tailed    Tests.

• Frequencies.

**-Chi-Square test of Independence for Discrete Data.**

The chi-square test is a statistical test used to determine if there is a significant association between two categorical variables. In SPSS (Statistical Package for the Social Sciences), you can perform the chi-square test using the "Crosstabs" procedure.

Chi-square test assumes certain conditions, such as independent observations and expected cell frequencies not being too small. If these assumptions are violated, other tests or adjustments may be more appropriate.

**-Correlation Analysis.**

Correlation analysis in SPSS (Statistical Package for the Social Sciences) is a statistical technique used to evaluate the strength and direction of the relationship between two continuous variables. SPSS provides a user-friendly interface to perform correlation analysis. Here's a step-by-step guide on how to conduct correlation analysis in SPSS.

**Hypothesis Testing-**

Hypothesis testing is a statistical method used to make inferences about population parameters based on a sample of data. It involves formulating a hypothesis about the population parameter, collecting data, and then using statistical techniques to determine whether the observed data provides enough evidence to reject the null hypothesis in favor of the alternative hypothesis.

Hypothesis testing is widely used in various fields, including science, business, and social sciences, to make informed decisions and draw conclusions from data.

**Null Hypothesis (H0):** This is a statement of no effect, no difference, or no change in the population parameter.

**Alternative Hypothesis (H1 or Ha):** This is a statement that contradicts the null hypothesis, suggesting an effect, difference, or change. It is what the researcher aims to **support.**

**Choose Significance Level (α):**

The significance level, often denoted by α, is the probability of rejecting the null hypothesis when it is true. Common choices include 0.05, 0.01, or 0.10.

**Calculate P-value:**

The p-value is the probability of observing a test statistic as extreme as, or more extreme than, the one observed, assuming the null hypothesis is true. A small p-value (usually less than the chosen significance level) suggests evidence against the null hypothesis.

**Make a Decision:**

If the p-value is less than or equal to the significance level, reject the null hypothesis in favor of the alternative hypothesis. Otherwise, fail to reject the null hypothesis.

**Draw Conclusions:**

Based on the decision made, Draw conclusions about the population parameter.Conclusions in research serve as the final thoughts or summaries of the findings and analysis presented in a study. The type of conclusion you draw can depend on various factors, including the nature of the research, the objectives, and the methodology used. Here are several types of conclusions commonly found in research:

**Summary Conclusion:**
This type of conclusion provides a concise summary of the main findings and key points of the research. It reiterates the research question or problem and briefly outlines the major results.

**Implications and Recommendations:**
This conclusion type discusses the broader implications of the study and suggests recommendations for further research or practical applications.
It often explores how the research findings contribute to existing knowledge or inform future actions.

**Limitations and Future Research:**
Researchers acknowledge the limitations of their study, such as sample size, methodology constraints, or data limitations.
They may propose directions for future research to address these limitations and expand on the current study.

**Policy or Practical Implications:**
Some research, particularly in fields like social sciences and public policy, concludes by discussing the potential policy implications of the findings.
It may suggest how the research can be applied in real-world scenarios to address specific issues.

**Theoretical Contributions:**
In theoretical research, the conclusion may focus on the contributions the study makes to existing theories or the development of new theoretical frameworks.
It highlights the ways in which the research advances understanding within the academic discipline.

**Call to Action:**
A conclusion may end with a call to action, urging readers to consider the importance of the research and its potential impact on their perspectives or behaviors.
This type of conclusion is common in studies with a strong social or environmental focus.

**Reflective Conclusion:**
In some cases, researchers may include a reflective component, discussing personal insights gained during the research process or any unexpected discoveries.
This type of conclusion adds a subjective element to the overall research narrative.

**Cautious or Tentative Conclusion:**
When the research findings are not definitive or the data is inconclusive, the conclusion may be more cautious, highlighting the need for further investigation or verification.

**Closing Thoughts or Final Remarks:**
A more narrative style of conclusion that offers final thoughts, reflections, or insights related to the research.
It may bring the study to a close in a thoughtful and meaningful way.
It's important to note that the choice of conclusion type depends on the specific requirements of the research, the field of study, and the overall goals of the investigation.

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# Research Methodology- An Introduction to Literary Studies

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**ABSTRACT**

Research methodology is a way to systematically solve the research problem. It may be understood as a science of studying how research is done scientifically. In it we study the various steps that are generally adopted by a researcher in studying his research problem along with the logic behind them. It is necessary for the researcher to know not only the research methods/techniques but also the methodology. Researchers not only need to know how to develop certain indices or tests, how to calculate the mean, the mode, the median or the standard deviation or chi-square, how to apply particular research techniques, but they also need to know which of these methods or techniques, are relevant and which are not, and what would they mean and indicate and why. Researchers also need to understand the assumptions underlying various techniques and they need to know the criteria by which they can decide that certain techniques and procedures will be applicable to certain problems and others will not. All this means that it is necessary for the researcher to design his methodology for his problem as the same may differ from problem to problem.

**Keywords**: Research, Methodology, Research Methodology, Research Techniques, Qualitative research, Quantitative Research

## INTRODUCTION

Research in common parlance refers to a search for knowledge. Once can also define research as a scientific and systematic search for pertinent information on a specific topic. In fact, research is an art of scientific investigation. The Advanced Learner"s Dictionary of Current English lays down the meaning of research as "a careful investigation or inquiry specially through search for new facts in any branch of knowledge." Redman and Mory define research as a "systematized effort to gain new knowledge." Methodology is the systematic, theoretical analysis of the methods applied to a field of study. It comprises the theoretical analysis of the body of methods and principles associated with a branch of knowledge. Typically, it encompasses concepts such as paradigm, theoretical model, phases and quantitative or qualitative techniques.Research Methodology is science of studying how research is done scientifically. A way to systematically solve the research problem by logically adopting various steps. Methodology helps to understand not only the products of scientific inquiry but the process itself. Research Methodology aims to describe and analyse methods, throw light on their limitations and resources, clarify their limitations and resources, clarify their presuppositions and consequences, relating their potentialities to the twilight zone at the „frontiers of knowledge''.

## OBJECTIVES

The purpose of research is to discover answers to questions through the application of scientific procedures. The main aim of research is to find out the truth which is hidden and which has not been discovered as yet. Though each research study has its own specific purpose, we may think of research objectives as falling into a number of following broad groupings:

1. To gain familiarity with a phenomenon or to achieve new insights into it (studies with this object in view are termed as exploratory or formulative research studies);
2. To portray accurately the characteristics of a particular individual, situation or a group (studies with this object in view are known as descriptive research studies);
3. To determine the frequency with which something occurs or with which it is associated with something else (studies with this object in view are known as diagnostic research studies);
4. To test a hypothesis of a causal relationship between variables (such studies are known as hypothesis-testing research studies).

## TYPES OF RESEARCH

Research can be classified on the basis of time, purpose, settings, place and technique. Some researches have similarities and some have little variations. But all the types of research have its own significance.

**Basic Research**: It is also called as pure research. Research for the sake of enhancement of knowledge is termed as Basic Research. It is done with the intention of overpowering of the unknown facts. It is concerned with the generalizations and also with the formulation of new theory. Basic research may not produce solutions or results to the present problem but it contributes something to the scientific knowledge. Though its work may have zero importance, but it may become useful in the future.

**Applied Research**: It is also called as practical research or „need based" research. The main intention is to find solutions to the current problems being faced by an institution, society, business or in government offices. Research to identify social, political and economic changes, which has adverse effects in different sectors are some of the examples of applied research. This type of research is mainly carried on with the secondary data.

**Empirical Research**: It is often referred to as experimental research. In this primary data is collected, analyzed, interpretation is done and subjected to hypothesis testing. Researcher should develop his experimental designs and should provide working hypothesis before the commencement of his research for good output.

**Qualitative Research**: As the name itself suggests, this research is concerned with the qualitative process. It generally works with the study of human behavior. By this research one can find the body language, attitude, opinions, feelings etc. from the opposite person through observation. It is mainly helpful for Psychiatrists and interviewers. Many techniques are being used like word association test, sentence completion, drawing pictures, Thematic Apperception Test. It is needed in times where quantitative research does not work. Hence, it is also called as „Motivation Research".

**Quantitative Research**: This research is mainly concerned with the measurement of phenomenon in terms of quantity. Many a times a debate is conducted between qualitative and quantitative terms. An example for the quantitative research is carrying out senses for collecting population, social, economic statistics of a particular area. They are subjected to statistical analysis. It relays mainly on primary data like survey method and questionnaire method. However, one can observe the inter-dependence between one another.

**Descriptive Research**: As the name itself indicates, this research directly deals with description. It includes different data collection like survey method and factfinding techniques. The main character of this research is that, the researcher does not have control over the variables. He should describe what has happened and what is happening. Most Ex post facto projects use descriptive research.

**Some other types of research**: Apart from the above types of research, there are many other classifications like Longitudinal Research which is spread over for a long period of time. In this change takes place gradually. Historical Research which is concerned with the collecting of auto biographies, letters, documents, enquiries for knowing the past. Simulation Research deals with the creation of an artificial environment which is quite similar to real environment. Depending upon the need of the situation we can create and adjust to it.

**SIGNIFICANCE OF RESEARCH**

• It helps in framing of policies: Research helps in the framing of various government policies. Nearly all the government policies and budgets are planned and executed through research with the help of researcher. Annual budget, monthly budget, monetary and economic policies are all framed by the government. The government is assisted by various organizations for framing the policies through research.

• Basic aim is to gain knowledge: It leads to many ideas and changes old facts.

• It is used in business organization: Many business companies hire researcher to work on various things. It is used in studying the changes taking place in the market. It helps in capital budgeting, tax management and cost saving policies.

• It leads to discovery and innovation of unknown facts and unexplored theories. It leads to the growth of the society and its citizens. It gives chance to the researcher to go deep into the subject and to innovate it.

• It avoids superstitious beliefs, myths and prejudices: Many people are still not aware of the research activities and its importance. Many ancient beliefs and myths have been proven wrong with the help of research.

• It leads to development of social welfare and society.

• It is useful for Ph.D students to write their thesis. Thus, Research is a fountain of knowledge, which helps in solving all government policies, business problems, avoids superstitious beliefs and helps in the development and maturity of society and its citizens.

RESEARCH PROCESS:

1**. Formulating the research problem**: There are two types of research problems, viz., those which relate to states of nature and those which relate to relationships between variables. At the very outset the researcher must single out the problem he wants to study, i.e., he must decide the general area of interest or aspect of a subject-matter that he would like to inquire into. Initially the problem may be stated in a broad general way and then the ambiguities, if any, relating to the problem be resolved. Then, the feasibility of a particular solution has to be considered before a working formulation of the problem can be set up. The formulation of a general topic into a specific research problem, thus, constitutes the first step in a scientific enquiry. Essentially two steps are involved in formulating the research problem, viz., understanding the problem thoroughly, and rephrasing the same into meaningful terms from an analytical point of view.

2. **Extensive Literature survey:** Once the problem is formulated, a brief summary of it should be written down. It is compulsory for a research worker writing a thesis for a Ph.D. degree to write a synopsis of the topic and submit it to the necessary Committee or the Research Board for approval. At this juncture the researcher should undertake extensive literature survey connected For this purpose, the abstracting and indexing journals and published or unpublished bibliographies are the first place to go to. Academic journals, conference proceedings, government reports, books etc., must be tapped depending on the nature of the problem. In this process, it should be remembered that one source will lead to another. The earlier studies, if any, which are similar to the study in hand should be carefully studied. A good library will be a great help to the researcher at this stage.

3. **Developing a working hypothesis**: A research in any field of study do not give proper results unless and until we develop a working hypothesis. It is a tentative statement or assumption regarding the solution to the problem of study. It is an assumption which is used to draw the logical consequences. It is the key point of study and hence it should be limited and should contain much knowledge. It is helpful for researcher for predictions and also maintains complete focus on the study. It should be precise and clearly defined. It gives an idea of the type of data to be used and type of method or techniques for the study. In some research activities like exploratory or formulative, hypothesis is not used for testing.

4. **Preparing the research design**: The research problem having been formulated in clear cut terms, the researcher will be required to prepare a research design, i.e., he will have to state the conceptual structure within which research would be conducted. The preparation of such a design facilitates research to be as efficient as possible yielding maximal information. In other words, the function of research design is to provide for the collection of relevant evidence with minimal expenditure of effort, time and money. But how all these can be achieved depends mainly on the research purpose.

5. **Determining sample design**: The researcher must decide the way of selecting a sample or what is popularly known as the sample design. In other words, a sample design is a definite plan determined before any data are actually collected for obtaining a sample from a given population.

6. **Collecting the data**: The method of gathering or collecting the data is planned in data collection design. There are many types for collecting the data. The two types of collecting data are Primary data and Secondary data. Some of the important methods for collecting the Primary data are as follows:

**Questionnaire**: The method of collecting data in vast geographical areas is done through Questionnaire method. Hence questionnaires are mailed to the research areas and they are distributed among the respondents. It is a time saving and economical method but the main drawback is that the answers given by the respondents are not accurate.

**Interview**: The investigators prepare a set of questions and ask them in a serial vise to the respondents. There are different types of interview like personal, group, mock and telephone interview. It is fast procedure. We can get extra information which is related to the topic. But it is costly. Some respondents may try to hide some answers. It saves much time of the investigator.

**Observation**: This is also one type of collecting data primarily. In this researcher observes the day to day process of the society or a single person. Sometimes researcher has to involve in the process. It discovers the human behavior of the respondent. No doubt this method is cost effective but the data collected is also limited. It can"t predict the happenings of the future.

Secondary data can be collected through books, published articles, internet and syndicate services. Syndicate services are companies which collect and sell data to various people who are in need. It is suitable for researcher who wants to survey on large population. The disadvantage of this method is that the researcher will not enjoy extra information and it is very costly.

7. **Analysis of data**: Soon after the collection of data, the researcher turns to the process of analyzing the collected data. The raw data will be tuned. There are many things used for analysis like coding, tabulation, editing and statistical analysis. Data will be collected in the form of questionnaires or schedules. Hence the data collected in short forms will be elaborated through coding. Editing can be done at the time of collecting or collecting the data. Through editing the researcher removes all the mistakes in the project. It will be polished. Through tabulation the researchers do the work of preparing the tables.

8. **Hypothesis-testing**: After analysing the data as stated above, the researcher is in a position to test the hypotheses, if any, he had formulated earlier. Do the facts support the hypotheses or they happen to be contrary? This is the usual question which should be answered while testing hypotheses. Various tests, such as Chi square test, t-test, F-test, have been developed by statisticians for the purpose. The hypotheses may be tested through the use of one or more of such tests, depending upon the nature and object of research inquiry. Hypothesistesting will result in either accepting the hypothesis or in rejecting it. If the researcher had no hypotheses to start with, generalisations established on the basis of data may be stated as

**GENERALISATIONS AND INTERPRETATION**

If a hypothesis is tested and upheld several times, it may be possible for the researcher to arrive at generalisation, i.e., to build a theory. As a matter of fact, the real value of research lies in its ability to arrive at certain generalisations. If the researcher had no hypothesis to start with, he might seek to explain his findings on the basis of some theory. It is known as interpretation. The process of interpretation may quite often trigger off new questions which in turn may lead to further researches.

**PREPARATION OF THE REPORT OR THE THESIS**

Finally, the researcher has to prepare the report of what has been done by him. Writing of report must be done with great care keeping in view the following:

1. The layout of the report should be as follows:

(i) the preliminary pages;

(ii) the main text, and

(iii) the end matter.

In its preliminary pages the report should carry title and date followed by acknowledgements and foreword. Then there should be a table of contents followed by a list of tables and list of graphs and charts, if any, given in the report. The main text of the report should have the following parts: (a) Introduction: It should contain a clear statement of the objective of the research and an explanation of the methodology adopted in accomplishing the research. The scope of the study along with various limitations should as well be stated in this part. (b) Summary of findings: After introduction there would appear a statement of findings and recommendations in non-technical language. If the findings are extensive, they should be summarised. (c) Main report: The main body of the report should be presented in logical sequence and broken-down into readily identifiable sections. (d) Conclusion: Towards the end of the main text, researcher should again put down the results of his research clearly and precisely. In fact, it is the final summing up.

**CRITERIA OF GOOD RESEARCH**

Whatever may be the types of research works and studies, one thing that is important is that they all meet on the common ground of scientific method employed by them. One expects scientific research to satisfy the following criteria: 1. The purpose of the research should be clearly defined and common concepts be used.

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

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

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

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

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

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

**CONCLUSION**

Research is a voyage of discovery; a journey; an attitude; an experience; a method of critical thinking; an activity caused by instinct of inquisitiveness to gain fresh insight/find answers to question/acquire knowledge.We do research by conceiving information and openings from  important research papers published by other researchers in the topic of interest and continue in our own directions. The work of some other researchers might have formed the basis of our research. Similarly, our research outcomes should help other researchers. That is, thework should be such that it should invite others to read and more importantly use it and cite it intheir research work. Our work should lead to recognition and respect. It should fetch joy and benefits others and as well as us. After all the base outcome of research is through the ladders of curiosity reach out to new arena of knowledge for everyone to aspire and make it another footstep towards the next.

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# Research Sampling Design and Techniques

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**Abstract**

In the realm of business research, companies frequently need to create samples of customers, clients, and employees to gather opinions. Sample design plays a crucial role in marketing and employee research, posing questions about the relevant population, sampling frame, and sampling unit. Determining the appropriate margin of error, assessing sampling and non-sampling errors, and addressing these aspects during the sample design process are essential. Sampling involves selecting subsets from a population to form the basis for estimating outcomes and revealing unknown information. While sampling has advantages such as cost and resource savings, there are also associated disadvantages. In the field of Information and Communication Technology (ICT), sampling is less restrictive, minimizing constraints related to heavy tool and technology use in predicting research outcomes.

**Keywords** : Sampling, design, errors, outcomes.

**Introduction**

A sample design is made up of two elements.

▪ Sampling method:- The sampling method pertains to the rules and procedures governing the inclusion of certain population elements in the sample. Common sampling methods include simple random sampling, stratified sampling, and cluster sampling.

▪ Estimator:- Estimator is the process of calculating sample statistics is known as the estimator. Various sampling methods may employ distinct estimators. For instance, the formula for determining a mean score in a simple random sample differs from that used in a stratified sample. Similarly, the formula for standard error may vary across different sampling methods.

The optimal sample design is contingent on survey objectives and available resources. For instance, a researcher may opt for the most cost-effective design that meets the desired precision level. Alternatively, if working within a limited budget, a researcher might choose a design offering maximum precision without exceeding financial constraints. While a census could measure the entire population, it's more common to take a sample. A well-designed probability sample allows estimates not just for the sample but also for the underlying population. In a probability sample, each element in the population has a known non-zero chance of being chosen, providing everyone with an opportunity to contribute data. Notably, equal chances aren't mandatory; a known non-zero chance suffices. Probability samples offer desirable traits, including the ability to calculate a margin of error and confidence interval for estimates. This facilitates not only comparing the sample to its population but also comparing samples from different populations, as in multinational surveys ("3MC" surveys). An optimal sample design maximizes information per monetary unit, meeting precision requirements. In 3MC surveys, it's crucial that all samples are full probability samples from comparable target populations. Flexibility in sample design among countries is recommended, ensuring adherence to probability principles. Probability designs can be costly, leading some to opt for non-probability samples like convenience or quota samples to cut expenses. However, non-probability samples carry a high risk of bias, and crucially, the error in sample estimates cannot be measured.

**Sample Size And Selection**

Many novice researchers often contemplate the appropriate sample size. It's crucial to understand that a larger sample enhances the evaluation of outcomes at the research's conclusion. A bigger sample increases the likelihood that the sample mean and standard deviation accurately represent the population mean and standard deviation. For instance, in an IT survey, the necessary sample size relies on the statistical precision required for the findings. The goal in sample selection is to achieve optimal accuracy within a designated sample size and prevent bias, as bias can compromise factual integrity and jeopardize research outcomes.

An ideal sample would resemble a miniature representation of the entire population, reflecting every characteristic present in the whole population. While achieving a truly perfect sample is

impractical for complex populations (and even if it were possible, recognizing it as perfect would require measuring the entire population), a good sample strives to closely replicate the relevant characteristics of the population. Representativeness is key, ensuring that each sampled unit accurately mirrors the characteristics of a known number of units within the population.

**Observation Unit:** The entity subjected to measurement, serving as the fundamental unit of observation, also referred to as an element. When investigating human populations, observation units commonly pertain to individuals.

**Target Population:** The comprehensive set of observations under study. Clearly defining the target population is a crucial yet challenging aspect of research. For instance, in a political poll, determining whether the target population comprises all eligible adults, registered voters, or those who participated in the last election significantly impacts the resulting statistics.

**Sample:** A subset of a population.

**Sampled Population:** The complete set of all potential observation units that could have been chosen in a sample; the population from which the sample originated.

**Sampling Unit:** The unit actually chosen for sampling. When studying individuals without a list of all individuals in the target population, households may serve as the sampling units, with individuals in those households as the observation units.

**Sampling Frame:** The list of sampling units, such as residential telephone numbers for phone surveys, street addresses for personal interviews, or a list of farms or a map for agricultural surveys. Ideally, the sampled population aligns precisely with the target population, but this is seldom achieved, particularly in surveys of people where the sampled population is usually smaller than the target population.

**Sample Design:** Comprising two components, a sample design includes the sampling method. The sampling method entails the rules and procedures governing the inclusion of specific population elements in the sample, with common methods including simple random sampling, stratified sampling, and cluster sampling.

An ideal sample strives to minimize selection bias. Selection bias arises when certain segments of the target population are excluded from the sampled population. For instance, if a survey on household income excludes transient individuals, the estimates for average or median household income are likely to be inflated. Convenience samples often exhibit bias, as the units that are easiest to select or likely to respond may not be representative of the more challenging-to-select or non-responding units.

**Sampling Error:** Error can emerge during the sampling process, encompassing systematic and random sampling errors. Systematic error, attributed to the investigation, introduces bias, rendering the sample unrepresentative of the target population. This occurs when the sample is inadequately drawn, exemplified by the Literary Digest magazine poll, or when names are excluded due to difficulty in location or lack of cooperation, potentially leading to a biased sample.

Conversely, random sampling error, often termed chance error, is inherent in purely random sampling. Samples drawn from the same population seldom yield identical estimates of the population parameter. For instance, flipping 100 unbiased coins multiple times would produce varying results. This randomness, however, can be statistically described and considered when making inferences, as seen in political polls where assertions like "There is a 95% probability that the proportion of voters casting their ballot for Candidate A will fall within the interval from 43% to 47%" are made. Before selecting a sample, researchers define the acceptable error margin and desired confidence level, expressed as a confidence interval. Sampling error can impact inferences based on sampling in two key situations: when generalizing from the sample to a specific population, and when determining whether two or more samples were drawn from the same or different populations. In both cases, understanding and accounting for sampling error are essential for accurate interpretation and decision-making in research.

**Sampling Techniques**

**Simple Random Sampling: -**

Researchers employ two primary sampling approaches: probability sampling and non-probability sampling. Probability sampling allows a researcher to specify the likelihood of an element (participant) being included in the sample, while non-probability sampling lacks a means to estimate inclusion probability. When the researcher aims to generalize findings from the sample to the general population, probability sampling proves more useful and precise, albeit more challenging and costly than non-probability sampling. Probability sampling is also known as random sampling or representative sampling. The term "random" denotes the method used to select elements (participants,

cars, test items) from a population. In random sampling, each element in the population has an equal chance of being selected (simple random sampling) or a known probability of being selected (stratified random sampling). The sample is deemed representative because a properly drawn sample accurately reflects the parent population in all aspects. It's essential to note that random sampling differs from random assignment, which pertains to the process of placing participants into different experimental groups.

**Stratified Random Sampling:**  When the population exhibits heterogeneity, the employed approach is stratified random sampling, a form of probability sampling. Stratification involves classifying or grouping people based on characteristics such as position, rank, income, education, sex, or ethnic background. These groups are known as subsets or subgroups. In stratified random sampling, the population is divided into strata or groups. A random sample is then selected from each stratum based on the proportion that each subgroup represents in the overall population. Stratified random samples tend to offer greater accuracy in representing the population compared to simple random samples, although they demand more effort, and there is a practical limit to the number of strata employed. Constructing a comprehensive list of the population within each stratum is necessary since participants are chosen randomly from each group. Stratified sampling is commonly utilized in two distinct ways: first, when the primary interest lies in the sample's representativeness to comment on the population; second, when the focus is on comparing and contrasting between and among the various strata.

**Convenience Sampling:**  This method is employed due to its speed, cost-effectiveness, and ease of use. Convenient samples serve specific purposes and demand minimal planning. Researchers opt for participants readily available at the moment, making the process informal and straightforward compared to random sampling. In contrast to random sampling, where a well-defined population, a list of population members, random selection, and utilization of as many individuals as possible are required, convenience sampling involves considerably less effort. However, this ease comes with potential drawbacks, which we will elucidate. Convenience samples fall under non-probability sampling, making it impossible to specify the probability of any population element being selected for the sample. Moreover, identifying the population from which the sample was drawn becomes challenging.

**Quota Sampling:** In many extensive applications of sampling methodologies, it's not always feasible or preferable to list all members of the population and randomly select elements from that list. Factors influencing the use of alternative procedures include cost, timeliness, and convenience. Quota sampling emerges as one such alternative method, frequently employed by market researchers and those conducting political polls. Typically, when this approach is adopted, the population of interest is vast, and there are no readily available lists of names for random sampling. The Gallup Poll, renowned for its well-conducted surveys on major public issues and presidential elections, is an example of a poll that utilizes quota sampling..In the quota sampling technique, specific localities are chosen, and interviewers are assigned starting points, specified directions, and goals to meet quotas for subsets (such as ethnic origins, political affiliations, etc.) selected from the population. Despite some exceptions, national election predictions in recent years using quota sampling have been relatively accurate, surpassing mere guesswork. In implementing quota sampling, the initial step involves determining the subgroups of the population that are of interest. This decision is influenced by the nature of the problem under investigation. For issues of national significance (like abortion, drug use, or political preference), commonly utilized subsets include age, race, sex, socioeconomic level, and religion. The objective is to select a sample whose distribution of characteristics mirrors that of the population of interest. Ensuring the sample mirrors the population requires knowledge of the percentage of individuals within each subset, enabling a proportional representation in the sample. For instance, if ethnic groups like Italians, Germans, Russians, etc., are of interest, knowing their population percentages helps in selecting a sample that aligns with these percentages.

**Conclusion**

In the course of conducting research, our primary aim is to draw conclusions regarding a population characterized by a common trait. Given that populations are typically too vast for observations on every individual, we turn to the selection of a sample. The representativeness of the sample is crucial for making accurate inferences about the population, highlighting the significance of the sampling method. Probability sampling, employing random sampling where each element in the population has an equal chance of selection (or using stratified random sampling for subgroups), is considered the optimal means of obtaining a representative sample. In cases where probability sampling

is not feasible, non-probability sampling methods, such as convenience sampling, become necessary, albeit recognized as less methodologically sound. Convenience sampling, involving readily available participants, is the simplest but methodologically weakest technique. Quota sampling, essentially a refined form of convenience sampling, aims to better represent the population by sampling a specified percentage of participants from subgroups mirroring their prevalence in the overall population. Despite efforts, samples inherently deviate from perfect representation of the population, introducing some level of sampling error. The magnitude of this error is inversely linked to the sample size, with larger samples more likely to accurately represent population characteristics. Researchers, therefore, aim for samples of sufficient size to minimize sampling error to an acceptable level. Even with adequately sized samples, critical evaluation of the sampling method remains essential.

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## "Plagiarism in Research"

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**ABSTRACT**

Plagiarism is a major problem for research. There are, however, divergent views on how to define plagiarism and on what makes plagiarism reprehensible. In this paper we explicate the concept of "plagiarism" and discuss plagiarism normatively in relation to research. We suggest that plagiarism should be understood as "someone using someone else's intellectual product (such as texts, ideas, or results), thereby implying that it is their own" and argue that this is an adequate and fruitful definition. We discuss a number of circumstances that make plagiarism more or less grave and the plagiarizer more or less blameworthy. As a result of our normative analysis, we suggest that what makes plagiarism reprehensible as such is that it distorts scientific credit. In addition, intentional plagiarism involves dishonesty. There are, furthermore, a number of potentially negative consequences of plagiarism.

**Key words:** fabrication, intellectual contribution, plagiarism, scientific misconduct, software.

**INTRODUCTION**

Plagiarism is a well-known and growing issue in the academic world. It is estimated to make up a substantial part of the total number of serious deviations from good research practice. (Titus et al, 2008; Vitse and Poland 2012) For some journals it is indeed a serious problem, with up to a third of the published papers containing plagiarism. (Zhang, 2010; Baždarić, 2011;Butler, 2010) Given that plagiarism is perceived as a considerable problem for the research community, spelling out in some detail what is to count as plagiarism becomes a matter of pressing concern. The technical development of software for detecting plagiarism also raises questions: What degree of overlapping constitutes plagiarism, and is overlapping all that matters? Clarifying what constitutes plagiarism is one thing, and making clear what is wrong with it is another, although the two are interrelated. Are all forms of plagiarism equally bad? Are there perhaps even legitimate ways to plagiarize? If so, what makes plagiarism wrong?

In this paper we will mainly do two things. First, we will explicate the concept of "plagiarism", i.e. present an analysis of the concept aimed at further clarifying it. This means that we will look at previous uses of the term and through critical analysis come up with what we take to be an improved definition. While many organizations and research ethical guidelines present their definitions of "plagiarism", little work has so far been done in explaining and justifying the chosen definitions. Here we hope to make an important contribution. The point of the definition that we present is not to identify the essence or 'real nature' of plagiarism (we doubt that there is such a thing), but rather to extract one that is useful for the purpose of clarifying normative issues related to plagiarism, while being true to common uses of the term. Second, we will discuss plagiarism normatively, by taking a closer look at different aspects of it. We restrict our analysis to the context of research, since plagiarism in the arts, for instance, raise a partly different set of issues, and include partly different normative intuitions, which would require a separate analysis.

**WHAT IS PLAGIARISM?**

Since it is important to determine what constitutes misconduct in scientific writing, and "plagiarism" is a much used concept in discussions of scientific misconduct, one could perhaps expect agreement and a fairly high level of precision regarding what constitutes plagiarism. However, while there is agreement about paradigmatic cases of plagiarism, there is less agreement regarding how plagiarism should be defined. In fact, the issue is rarely discussed in detail.

When the concept is explained in a recent newsletter from the US Office of Research Integrity, it looks deceptively simple: "It involves stealing someone else's work and lying about it afterward." (Sox, 2012) Others prefer to speak of "copying" part of someone else's published work and using it without showing that it is borrowed from someone else. In the Longman Contemporary English Advanced

Learner's Dictionary, the act of plagiarism is defined as "when someone uses another person's words, ideas, or work and pretends they are their own".

In the scholarly definitions, the more technical notions of "appropriation" and "credit" are central: *"Plagiarism is the appropriation of other people's material without giving proper credit"* (The European Code of Conduct for Research Integrity); *"Plagiarism is the appropriation of another person's ideas, processes, results, or words without giving appropriate credit"* (US Federal Policy on Research Misconduct). So the basic ideas seem to be that someone deliberately takes someone else's work, whether in the form of an idea, a method, data, results, or text, and presents it as their own instead of giving credit to the person whose ideas, results, or words it is. This is mirrored in the definition given by Merriam- Webster: "to steal and pass off (the ideas or words of another) as one's own: use (another's production) without crediting the source".

## TYPES OF PLAGIARISM IN RESEARCH

Plagiarism is considered one of the most common ethical offences in academia. If a manuscript plagiarism checker finds any issues, your published work may be retracted, you may lose tenure or funding, and even worse, you will likely lose credibility as a researcher. One would think open online access would make it easier to do a plagiarism check online, but that's not always true. According to Wendy Sutherland-Smith, an expert in different types of plagiarism in research from Deakin University, "Correct attribution practices can also be more difficult to understand, particularly when seemingly free, widely available online information still requires referencing."[2] Hence, it's important to know what constitutes plagiarism, so you can avoid it when writing your manuscript. Here are the most common types of plagiarism in research.

**Deliberate plagiarism:** High competition among researchers caused by a pressure to publish multiple papers every year may tempt authors to replicate large chunks of previously published work. Another form of deliberate plagiarism is when authors pass off other's ideas or techniques as their own instead of doing the required research. Having manuscript plagiarism checkers proves very useful in pointing out if a piece of work is plagiarized or original. This intentional or deliberate type of plagiarism in research is considered extremely unethical and if caught can lead to major repercussions for the author/s.

**Accidental plagiarism:** This type of plagiarism in research if often unintentional and can occur due to author neglect or if manuscripts are submitted in haste. Not mentioning that text used is directly quoted from another paper or forgetting to use quotation marks when using passage from another paper or source is a serious ethical infraction. Hence, authors must check for accidental plagiarism and avoid it with a pre-submission manuscript assessment!

**Paraphrasing unethically:** While researchers should change or rewrite text completely when referring to previously published work, it is imperative to cite the source to avoid any type of plagiarism in research. This is essential because, even if the words differ, the original idea belongs to another. Paraphrasing but not citing the original text is considered intellectual theft and a serious case of ethical misconduct.

**Self-plagiarism:** Not many know about this type of plagiarism in research, making it rather common. Self-plagiarism occurs when authors use portions from their own previously published work, without the requisite permissions so be sure to conduct a research paper plagiarism check to find and fix this issue.

**Incorrect citation or invalid sources**: Citing a source that is incorrect or doesn't exist can be misleading and is considered dishonest. Another example of this is when a researcher uses a secondary source of data, but only cites the primary source. Both ways of citing sources inaccurately may simply be attempts to increase the number of citation references. However, these are likely to be considered as types of plagiarism in research and may result in disciplinary action.

## PLAGIARISING IDEAS? PLAGIARISING WORK?

What, then, counts as an intellectual product? The standard case of plagiarism is the use of someone else's text. We have seen that Merriam-Webster mentions "words or ideas", while Longman talks of "words, ideas, or work". Is it reasonable to say that ideas can be plagiarized – and what about work? Let us look at ideas first.

It seems that one can talk about plagiarizing ideas just as well as one can talk about plagiarizing research results or text, since ideas are obvious examples of results of intellectual work. If someone uses another's idea and implies that it is an idea of their own, that someone is plagiarizing.

True, it must be admitted that it may often be much more difficult to verify that an idea has been plagiarized compared to research results or text. Ideas are not always documented, but might be presented at conferences or in personal conversation, etc. The difficulty pertains both to finding out about the plagiarism and to making a convincing case for idea plagiarism to have taken place. There is no clever software to discern this, nor is it easily proven that an idea is not independently arrived at. These difficulties are, however, practical; they do not change the fact that ideas can be plagiarized.

What, then, about plagiarizing work? As previously noted, plagiarism in relation to work must concern intellectual work. In this context, the term "work" has two distinct senses: a product based on intellectual labor or that labor itself. When someone is plagiarizing a text presenting research results, thereby implying that they are presenting their own results, then that person also implies that they have done the work leading up to the results. In that sense you can say that the person is also plagiarizing the work put into it. By plagiarizing someone's idea, you, by the same token, make implicit claims about the work leading up to that idea.

But it is hard to see that it makes sense to talk about plagiarizing work (labor) directly. Let us look at an example: Say that Mr. A visits Ms B and sees a beautiful chair that Ms B has made to her own design. Mr. A goes home, builds an identical chair, and claims when friends ask that it is of his own design. When it comes to the chair, it is clear that it is the idea of making the chair just like that, i.e. the design, and not the work of making the chair (which he in fact did), that is plagiarized. Plagiarizing work means plagiarizing ideas relating to how to do the work, the results of work, or the documentation of how the work was performed, not the labor itself – the latter would be to *repeat* the work, not to plagiarize it. We therefore choose not to talk about work, but instead of an intellectual product being plagiarized. So, our definition will be the following.

**CONCLUSIONS**

We suggest that plagiarism should be understood as "using someone else's intellectual product (such as texts, ideas, or results), thereby implying that it is their own". This may be done intentionally or unintentionally. This fits the use of the term in ordinary language fairly well, while at the same time being sufficiently precise. Arguably it is reliable by being simple and easily comprehensible. We suggest that our discussion supports the view that the definition is theoretically fruitful and highly relevant for normative purposes. As a result of our normative analysis, we suggest that what makes plagiarism reprehensible is that it involves an unfair acquisition of scientific credit. In addition, intentional plagiarism involves dishonesty. In plagiarism of data or results, fabrication is also implied.

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# Qualitative Versus Quantitative Research

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**Abstract**

This paper intends to compare and contrast qualitative and quantitative research in brief. Based on library sources, the paper is prepared for the Bachelor and Master level research students plus interested one. The article initiated with the concept of research and its major purposes, and then associates the general information about qualitative, quantitative and mixed method research. Finally, it illustrates the relative and discrepancy between qualitative and quantitative research with a few concluding notes.

**Keywords**:  Qualitative research, mixed research, Research, quantitative research.

**Concept of research**

Research involves repeatedly observing a phenomenon, collecting data, and drawing conclusions. According to Grinnell (1993), it is a meticulous, systematic study aimed at establishing facts or principles within a specific field of knowledge. Cohen et al. (2007) describe research as a controlled inquiry that systematically collects, analyzes, and interprets data to address challenges and enhance conditions. Essentially, research is a systematic effort to uncover answers to problems, dedicated to establishing systematic, reliable, and valid knowledge about the social world. Various purposes drive research, with major objectives outlined below:

The key purposes of research include:

1. Generating new knowledge and discovering truth.
2. Enhancing understanding of phenomena.
3. Formulating new theories or revising existing ones.
4. Refining existing research methods.
5. Clarifying facts through systematic investigation.
6. Applying testing procedures.
7. Assisting in the decision-making process for effective planning, program development, and
 implementation.
8. Conducting scientific studies to contribute to the broader body of knowledge.

Indeed, research serves specific purposes, encompassing both the pursuit of knowledge for its own sake and contributing practically to real-world applications. The dual nature of these objectives underscores the versatility and comprehensive impact of research endeavours.

When conducting research, it is crucial to adopt a specific design that outlines procedures and logistical arrangements, offering a comprehensive framework for the study. According to Kumar (2005), a research design is a procedural plan chosen by the researcher to address questions with validity, objectivity, accuracy, and efficiency. Research designs exist within qualitative, quantitative, and mixed methods approaches, serving as specific directions for procedural aspects. Denzin and Lincoln (2011) alternatively refer to them as strategies of inquiry. Broadly, research can be categorized into two types based on the mode of inquiry:

**Qualitative research**

Qualitative research involves observing, analyzing, and interpreting data by studying people's actions and expressions. It adopts a naturalistic and interpretative approach, aiming to comprehend the meanings individuals attribute to various phenomena within their social worlds (Denzin & Lincoln, 2005). Berg (2007) highlights its focus on meanings, concepts, definitions, characteristics, metaphors, symbols, and descriptions.

This subjective research method employs diverse data collection techniques, such as individual in-depth interviews and focus group discussions. Qualitative research is exploratory and open-ended, providing insights beyond what quantitative data alone can reveal. It delves into understanding the meanings individuals or groups associate with social or human problems, shedding light on human behavior and the social world.

The ultimate goal of qualitative research is to develop concepts that aid in understanding social phenomena in natural settings, giving prominence to the perspectives and experiences of all participants. Examples of qualitative research approaches include Narrative research, Phenomenology, Grounded theory, Ethnographies, and Case studies.

Qualitative research addresses questions such as why people behave as they do, how opinions and attitudes form, the impact of events on individuals, and the development of cultures and their underlying reasons.

**Quantitative research**

Quantitative research involves explaining phenomena through the collection of numerical data analyzed using mathematically based methods, particularly statistics. It is characterized by control, objectivity, and a focus on quantifying variations in situations, issues, events, or phenomena. The primary goal is to develop and apply mathematical models, theories, and/or hypotheses related to phenomena. As expressed by Leedy (1993):

Quantitative research involves the systematic investigation of phenomena and their relationships through measurable numbers. It aims to answer questions related to relationships within measurable variables, seeking to explain, predict, and control phenomena.

The primary objective of quantitative research is to establish the connection between an independent variable and a dependent or outcome variable in a population. This approach tests objective theories by examining the relationships among measurable variables. These variables are typically quantifiable through instruments, enabling the analysis of numerical data using statistical procedures and hypotheses related to phenomena.

Central to quantitative research is the process of measurement, providing a crucial link between empirical observation and the mathematical expression of quantitative relationships. Researchers analyze the data using statistical methods. Examples of quantitative research include experimental and non-experimental designs.

**Qualitative vs. quantitative**

| Qualitative Research | Quantitative Research |
|---|---|
| That aligns with qualitative research methods, which focus on exploring and understanding human behavior, thoughts, and experiences through in-depth analysis and interpretation. | That aligns with quantitative research methods, where the primary focus is on collecting numerical data and employing statistical analysis to draw conclusions and identify patterns. |
| Once again, that points towards qualitative research methods, which are well-suited for exploring issues and gaining insights when there isn't a predetermined set of questions. | That aligns with quantitative research methods, which utilize statistical, logical, and mathematical techniques to generate numerical data and derive concrete facts. |
| It's common for the planning phase to require less time compared to the analysis phase in research processes, as careful planning sets the groundwork for efficient data collection and analysis | An extended planning phase is not uncommon, especially in complex research projects, where meticulous preparation is crucial to ensure a well-organized and effective analysis phase. |

**Conclusion**

While qualitative and quantitative research share some similarities in patterns, structures, and procedures, they diverge in their treatment of data. They are not mutually exclusive, and the distinction lies in how researchers choose to collect, analyse, and interpret the data.

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John W. Creswell which is in its 3rd edition, 2016,, explores the elements related to five qualitative inquiry.
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# Research Design And Methodology

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**ABSTRACT :**

There are a number of approaches used in this research method design. The purpose of this chapter is to design the methodology of the research approach through mixed types of research techniques. The research approach also supports the researcher on how to come across the research result findings.

In this research design ,the general design of the research and the methods used for data collection are explained in detail. It includes three main parts. The first part gives a highlight about the dissertation design. The second part discusses about qualitative and quantitative data collection methods. The last part illustrates the general research

framework. The purpose of this section is to indicate how the research was con-ducted throughout the study periods.

**Keywords:** research design, methodology, sampling, data sources,population, workplace

## 1. INTRODUCTION:

Research methodology is the path through which researchers need to conduct their research. It shows the path through which these researchers formulate their problem and objective and present their result from the data obtained during the study period. This research design and methodology chapter also shows how the research outcome at the end will be obtained in line with meeting the objective of the study. This chapter hence discusses the research methods that were used during the research process.

It includes the research methodology of the study from theresearch strategy to the result dissemination. For emphasis, in this chapter, the author outlines the research strategy, research design, research methodology, the study area, data sources such as primary data sources and secondary data, population consideration and sample size determination such as questionnaires sample size determination and workplace site exposure measurement sample determination.

Data collection methods like primary data collection methods including workplace site observation data collection and data collection through desk review, data collection through questionnaires, data obtained from experts opinion, workplace site exposure measurement, data collection tools pretest, secondary data collection methods, methods of data analysis used such as quantitative data analysis and qualitative data analysis, data analysis software, the reliability and validity analysis of the quantitative data, reliability of data, reliability analysis, validity, data qualitymanagement, inclusion criteria, ethical consideration and dissemination of result and its utilization approaches. In order to satisfy the objectives of the study, a qualitative and quantitative research method is apprehended in general.

The study used these mixed strategies because the data were obtained from all aspects of the data source during the study time. Therefore, the purpose of  this methodology is to satisfy the research plan and target devised by the researcher.

## RESEARCH  DESIGN :

The research design is intended to provide an appropriate framework for a study. A very significant decision in research design process is the choice to be made regarding research approach since it determines how relevant information for a study will be obtained; however, the research design process involves many inter-related decisions [1].

This study employed a mixed type of methods. The first part of the study consisted of a series of well-structured questionnaires (for management, employee's representatives, and technician of industries) and semi-structured interviews with key stakeholders (government bodies, ministries, and industries) in participating organizations. The other design used is an interview of employees to know how they feel about safety and health of their workplace, and field observation at the selected industrial sites was undertaken.Hence, this study employs a descriptive research design to agree on the effects of occupational safety and health management system on employee health, safety, and property damage for selected manufacturing industries. Saunders [2] and Miller [3] say that descriptive research portrays

an accurate profile of persons, events, or situations. This design offers to the researchers a profile of described rel-evant aspects of the phenomena of interest from an individual, organizational, and industry-oriented perspective. Therefore, this research design enabled the researchers to gather data from a wide range of respondents on the impact of safety and health on manufacturing industries in Ethiopia. And this helped in analyzing the response obtained on how it affects the manufacturing industries' workplace safety and health. The research overall design and flow process are depicted .

**CONCLUSION :**

The research methodology and design indicated overall process of the flow of the research for the given study. The data sources and data collection methods were used. The overall research strategies and framework are indicated in this research process from problem formulation to problem validation including all the param-eters. It has laid some foundation and how research methodology is devised and framed for researchers. This means, it helps researchers to consider it as one of the samples and models for the research data collection and process from the beginning of the problem statement to the research finding. Especially, this research flow helps new researchers to the research environment and methodology in particular.

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# Identification of Research Areas in Home Science
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**Abstract:**

Home science is both a science and an art; it assists everyone in leading a fulfilling personal and social life and in cultivating the virtues of good citizenship. A person's development of good individuality and a strong sense of personality can be greatly influenced by home science. The contemporary understanding of this topic is to raise children in households with harmony, wealth, and achieving the highest happiness.

**Keywords**: food & nutrition, human development and childhood studies, fabric apparel science, resource management, communication and extension.

**Introduction:**

There are several names for home science used throughout the world. Yet, they are all comparable in terms of the type of substance and viewpoint. It is referred to by the titles Euthenics, Household Economy, Household Science, Household Art, and Domestic Art.. It is referred to as home science in India , Britain and as home economics in America. The preservation and improvement of human relationships via the development and wise application of all available material and human resources to attain, It can be derived as "application of scientific knowledge in a systematic manner towards improving the quality of home and family life. Traditionally, the field of home science involves five areas, namely

- Food and Nutrition
- Human Development and Childhood studies
- Resource management
- Fabric apparel science
- Communication and extension

All these areas have their specific content and focus that donate to the study of the individual and the family in Indian socio-cultural context. Home Science equips the future citizens with relevant knowledge, competencies and prepares them to become efficient custodians of the nation's future (Lokita Gupta, 2016).

**Food and Nutrition:**

Eating well can help maintain physical strength. Food amount and quality should be taken into account. Dietetics, the study of nourishment, examines whether a diet is sufficient during a person's normal life cycle and what changes are necessary when they are ill (B. Srilakshmi, 2005). Teachers, health professionals, administrators, and students studying the health sciences must all have a solid understanding of diet and nutrition. The goal of researching food and nutrition is to understand the life cycle that is below normal and the necessary dietary adjustments during illness (B. Srilakshmi, 2005). Understanding healthy eating habits and Purpose of studying foods and nutrition is given below

- Recognizing the interrelationship of food, nutrition and health
- Planning and preparing balanced meal as per nutritional requirement
- Planning and preparing therapeutic meals for the sick

**Human Development and Childhood Studies:**

There are four main motivations for scientific child research: solving a real-world issue, challenging conventional wisdom that has guided child rearing practices, developing hypotheses about various topics, and evaluating data from scientific investigations (Elizabeth B. Harrison, 2005), Gaining a deeper understanding of children is the primary goal of researching their development. Studying development concepts is necessary and important because, as noted by Locke (2005)

.• Knowing about developmental patterns for different age groups helps us to know what to expect from a child and when to expect.

- Knowing what to expect at a particular age group helps in knowing about the standards or norms
.• If parents and teachers are aware they can guide the children accordingly from one stage to another

**Resource management:**

Home management is a practical science. Managing demonstrates some degree of proficiency in this area. Therefore, a house where objectives are fulfilled to some extent could be seen. Therefore, a home that achieves its objectives and provides some level of satisfaction could be deemed well-managed. Effective management entails optimizing the utilization of both people and material resources. The process of employing family resources to accomplish family goals is made up of a number of decisions. well-kept residence. Effective management entails optimizing the utilization of both people and material resources.

• Becoming a consumer conscious individual. Wisely managing family income and expenditure

• Recognizing the need for saving money and making investments

• Adopting work simplification measures for overcoming fatigue and managing time and energy

• Recognizing the mutual relationship between space organization and aesthetics

• Optimally utilizing and conserving energy sources around you

• Developing eco- friendly consciousness. Developing attitude for work ethics and ethical standards in daily living

**Fabric apparel sciences:**

Clothes has a significant impact on interpersonal relationships. Clothes has a big influence on how one interacts with others and creates an impression. Clothing influences how the wearer acts. People's appearance and mannerisms do affect how we view them, but how we interpret an individual depends on the observer, his or her familiarity with the subject, and the context in which the person is viewed. First and foremost, we require food, clothing, shelter, and the country.

Understanding the textile industry in the context of India's overall planning process and the goals envisioned for our nation's socioeconomic growth will help us better appreciate the role textiles play in our lives. There has been a new universe in textiles over the last few decades. New finishes, fibers, and textiles provide new requirements for comprehension and assessment. Through this subject, we can accomplish the following goal fresh fibers.

• Wisely selecting fabric for different end uses.

• Getting acquainted with different textile finishes and using simple techniques for fabric enrichment

• Wisely selecting and maintaining clothing and textiles

**Communication and Extension :**

It blends informal and adult education. It focuses on teaching adults, such as farmers or stay-at-home parents, how to raise better crops, animals, and fruit trees; how to manage their homes more effectively; how to take care of the family's nutrition; and other related skills rather than teaching them the alphabet, grammar, or language. The idea, ideology, discipline, profession, theory, and practices related to extension education have all changed.

.• To bring about desirable change in the human behavior, this includes change in knowledge, skill and attitudes

.• To make the people aware that kitchen gardening and small scale industries are a profitable professions

.• To create an environment for rural people so that they can show their talent, leadership and efficiency.

• To provide latest technical know-how to the farm wives with the fact and figures in the shortest time.

• To provide appropriate solution of their problems

.• To bring the scientist close to the farmers

**Research trends in home science:**

Resource management, human development and family studies, foods and nutrition, apparel and textiles, and extension-education are just a few of the disciplines that fall under the umbrella of home science. This shows that although while these fields are studied independently, they are interdependent studies of the various facets of the same subject—that is, the human being. A methodical approach to investigating, evaluating, and intellectualizing human behavior with the goal of raising life quality is home science research. It serves a variety of purposes. They are: dependent investigations of the many facets

.• Innovation of new facts and their interpretation

.• Diagnosis of problems and their analysis

.• Systemization of  knowledge.

• Prediction and control over social phenomena

.• Policy formulations for further development

.• Social welfare

A strong methodological innovation is currently there, whereas it was absent previously. Home science study is shedding light on important background information that the planner can use to form his own opinion on the current state of affairs. There has been a strong methodological innovation in the previous 20 years, which was absent earlier. Research in home science is shedding light on important background information from which the planner can independently evaluate the current circumstances. Over the past twenty years, a growing number of state government bodies, voluntary organizations, the Indian Agriculture Research Institute, the Indian Council for Agricultural Research, the University Grants Commission, and the Indian Agriculture Research Institute have made money available to assist social science and home science research. An growing amount of monies have been made available.

**Importance of Home Science:**

• Changes efficient scientific attitude towards work

• Simplifies avoidance of wastage

• Develops skills in students and house wife's

• Helps in training healthy citizens

.• Grow an eye for beautification

• Can deal with minor illness and emergencies with empathetic and appropriate action

• Knowledge of child development, nutrition, etc. helps them to impart this knowledge to less privileged ones.

**Conclusion and Recommendations:**

. Home science is probably the only career that requires such a wide range of skills. Modern home science education aims to build the nation as a whole, not just to enhance the home and family unit. It is essential to the advancement of humanity, higher standards of life, and the welfare of the country. Teens who study home science have healthier eating habits than those who don't (Pallavi Yadav, et al., 2017). There are many career options available, including teaching and working in research institutions. However, there are also other fields one can work in, including food auditing, companies that conduct research on new food products, laboratories that ensure food safety and quantity, and food and nutrition consultants in hospitals. It offers a wide range of career options.,. Fashion designers work in boutiques, educators serve as counselors in schools, wellness centers, corporations, agencies, and entrepreneurs

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# Research Paradigms: Qualitative, Quantitative and Mixed Method
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**Abstract:**

The present article describes the paradigms of qualitative and quantitative research. The purpose of this article is to introduce post-graduates and new researchers with quantitative and qualitative research design and to benefit them select the best technique based on the type of information. With this article, author attempts to confer quantitative and qualitative research approaches within the comprehensive ground of educational research, in the reflection of observing for probable resemblances and variances between the two approaches. With this article author initiated with the concept of research and its major purposes, and then links with general information about qualitative, quantitative and mixed method approaches. As well it defines the new approach as mixed method design. Finally, it illustrates the absolute and discrepancy between qualitative and quantitative research with a few concluding notes.

**Keywords:** Research Paradigms, Quantitative research, Qualitative research, Mixed method

## 1. Introduction

Generally, research refers to a systematic investigation to find answers to a problem. According to Kerlinger (1986), „scientific research is a systematic, controlled empirical and critical investigation of propositions about the presumed relationships about various phenomenon". In nutshell, research is primarily committed to establishing systematic, reliable and valid knowledge about the social world. The research has many purposes, the major is listed here:

➢Generating new knowledge/finding truth Improving understanding
➢Formulating new theories /revision of existing theories
➢Refining existing research method
➢Clarification of fact
➢Application of testing
➢To help in decision making process for effective planning, program and implementation
➢Scientific study

On the other hand, the specific purposes of research are:

➢For the sake of knowledge
➢For practical contribution

In conducting research, we need to emphasis on specific design that provides us idea about procedures and logistical provisions required and provide a whole context to commence a study. A research design is a procedural plan that is adopted by the researcher to answer questions validly, objectively, accurately and economically (Kumar, 2005). Research designs are types of inquiry within qualitative, quantitative, and mixed methods approaches that provide specific direction for procedures in a research design. Others have called them strategies of inquiry (Denzin & Lincoln, 2011).

The word paradigm can be used to mean either approach or design. Paradigms derived from the Greek word for exhibiting side by side in lexica is given with translations examples or tables of changes in form and difference in form. Thus, Paradigms are ways of organising information so that fundamental, abstract relationship can be clearly understood. The idea of paradigm directs attention to science as having recognised patterns of commitments, questions, method and procedure that underlie and give direction to scientific work. The concept of paradigm provides a way to consider the divergence in vision, custom and tradition. It enables us consider science as having different sets of assumptions, commitments, procedures and theories of social affairs. A paradigm could be regarded as a cultural man-made object, reflecting the dominant notions about scientific behaviour in a particular scientific community, be it national or International, and at a particular point in time. Paradigm determines scientific approaches and procedure which stand out as exemplary to the new generation of scientist– as long as they do not oppose them.

The research methodology that was traditionally used in social sciences for several decades was the quantitative methodology, which originated in the natural sciences such as biology, chemistry, physics, geology, and was concerned with investigating things which could be observed and measured

in some way. Quantitative research was the generally accepted research paradigm in educational research until the early 1980s, when the "paradigm wars" between advocates of quantitative and qualitative research reached a new peak (Guba, 1990; Tashakkori and Teddlie, 1998). During the 1980s, many quantitative and qualitative researchers argued that their approach was superior. Some of these researchers were "purists," in the sense that they argued that the two approaches could not be used together because of differences in the world views or philosophies associated with the two approaches. Quantitative and qualitative paradigms of research form two different ways of looking at the world"s phenomenon. The qualitative research design is also known as the socio-Anthropological research paradigm. It is interpretative, and ethnographic in nature. The fundamental approach involves detailed observation, explanation and undertakes that it is impossible to describe exactly what basics are important and crucial and should be measured to the exclusion of others. It claims that validity is important than attempting strictly to define what is being observed and by so doing study the whole condition. Its efforts to study the whole situation in order to evaluate the density and confirm that their assumption take account of both unique and general factors. Qualitative and quantitative research are often presented as two fundamentally different paradigms through which we study the social world. These paradigms act as lightning conductors to which sets of epistemological assumptions, theoretical approaches and methods are attracted. Each is seen to be incompatible with the other (Bryman 2001: 445). These paradigmatic claims have a tendency to resurface from time to time, manifesting themselves in the effects of different cultural traditions upon intellectual styles of research (Galtung 1982).On the other hand, quantitative research paradigm is empirical in nature; it is also identified as the scientific research paradigm. The paradigm ensures validity by the process of rigorous clarification, definition or use of pilot experiments. That is trying out the instruments beforehand, and checking their significance with experts and assessing their reliability by use of statistical tests. This approach can be further sub-classified into inferential, experimental and simulation approaches to research. There has been much debate about quantitative and qualitative approaches to research in different disciplines. In the behavioural and social sciences, these two paradigms are associated to expose their relative strengths and weaknesses. But the debate about both traditions has generally taken place in academic books. It is tough to find an article that deals with the generic issues associated to the quantitative and qualitative split by drawing on eminent research literature.

Research designs are types of inquiry within qualitative, quantitative, and mixed methods approaches that provide specific direction for procedures in a research design. Others have called them strategies of inquiry (Denzin & Lincoln, 2011).

## 2. Qualitative Research Approach

Qualitative research collects, analyses, and interprets data by observing what people do and speak. Qualitative research is naturalistic, interpretative approach concerned with understanding the meanings which people attach to phenomena (actions, decisions, beliefs, values etc.) within their social worlds (Denzin & Lincoln, 2005). Berg (2007) states it refers to meanings, concepts, definitions and characteristics, metaphors, symbols and descriptions of things.

Instead of providing a broad view of a phenomenon that can be generalized to the population, qualitative research seeks to explain a current situation and only describes that situation for that group. Since only a current situation is observed, all qualitative research is done in the field. A possible exception is the focus group, which is conducted with 3-10 persons and uses a script of questions. The moderator asks the questions and the plotter records the responses. Though a focus group is directed in a controlled environment, the open-ended questions and lack of rigid sample selection make it seem more like a field exercise.

Qualitative research answer questions on: Why people behave the way they do? How opinions and attitudes are shaped? How people are affected by the events that go on around them? How and why cultures have developed?

## 3. Quantitative Research Approach

Quantitative research is 'explaining phenomenon by collection numerical data that are analysed using mathematically based methods (in particular statistics)' (Aliaga and Gunderson, as cited in Muijs, 2004). Quantitative research is controlled, obstructive, objective and product oriented which aims at quantifying the variation of certain situation, issue, even or phenomenon. Quantitative Research establishes statistically significant conclusions about a population by studying a representative sample of the population. The population consists of the entire group being studied. It does not matter if the

population is broad or narrow, only that it includes every individual that fits the description of the group being studied. The objective of quantitative research is to develop and employ mathematical models, theories and /or hypothesis pertaining to phenomena. Leedy (1993) utters:

Quantitative research method deals with numbers and anything that is measurable in a systematic way of investigation of phenomenon and their relationships. It is used to answer questions on relationships within measurable variables with an intention to explain, predict and control phenomena. The quantitative research aims to govern the relationship between one thing (an independent variable) and another (a dependent or outcome variable) in a population. It is an approach for testing objective theories by examining the relationship among variables. These variables, in turn, can be measured, typically on instruments, so that numbered data can be analysed using statistical procedures and /or hypothesis pertaining to phenomena.

**Distinction between Quantitative and Qualitative Research Paradigms**

Pure quantitative research relies on the collection of quantitative data (i.e., numerical data) and follows the other characteristics of the quantitative research paradigm shown in Table 1. Pure qualitative research relies on the collection of qualitative data (i.e., non-numerical data such as words and pictures). First, the quantitative research approach primarily follows the confirmatory scientific method because its focus is on hypothesis testing and theory testing. Quantitative researchers consider it to be of primary importance to state one‟s hypotheses and then test those hypotheses with empirical data to see if they are supported. On the other hand, qualitative research primarily follows the exploratory scientific method. Qualitative research is used to describe what is seen locally and sometimes to come up with or generate new hypotheses and theories. Qualitative research is used when little is known about a topic or phenomenon and when one wants to discover or learn more about it. It is commonly used to understand people‟s experiences and to express their perspectives. Researchers advocating mixed research argue that that it is important to use both the exploratory and the confirmatory methods in one‟s research (Johnson & Onwuegbuzie, 2004).

Quantitative and qualitative researches are also distinguished by different views of human behaviour. In quantitative research, it is assumed that cognition and behaviour are highly predictable and explainable. Traditionally, the assumption of determinism, which means that all events are fully determined by one or more causes, was made in quantitative research (Salmon, 2007). Because quantitative research has not identified any universal or unerring laws of human behaviour, most contemporary quantitative researchers search for probabilistic causes (Humphreys, 1989). Table 1 below shows a summary of major differences between quantitative and qualitative approaches to research.

**Table 1: Differences between Quantitative and Qualitative Research Approaches**

| Orientation | Quantitative Approach | Qualitative Approach |
|---|---|---|
| Paradigm/Worldview (assumption about world) | Positivism/Realism | Interpretivism/Idealism |
| Research Purpose (rationale) | Numerical description Causal explanation Prediction | Subjective description Empathetic understanding Exploration |
| Epistemology (theory of knowledge) | Dualist/Objectivist | Subjectivist |
| Methodology (aims of scientific investigation) | Experimental/Manipulative | Hermeneutical/Dialectical |
| Research Methods (techniques and tools) | Empirical examination Measurement Hypothesis testing Randomization Blinding Structured Protocols Questionnaires | Ethnographies Case studies Narrative Research Interviews Focus group discussion Observations Field notes Recordings & Films |
| Scientific Method | Deductive approach, | Inductive approach, |

| (role of theory) | testing of theory | generation of theory |
|---|---|---|
| Nature of Data Instruments | Variables Structured and Validated-data collection instruments | Words, images, categories In-depth interviews, participant observation, field notes, and open-ended questions |
| Data Analysis | Identify statistical relationships among variables | Use descriptive data, search for patterns, themes ad holistic features and appreciate variations |
| Results | Generalizable findings | Particularistic findings; provision of insider viewpoint |
| Final Report | Formal statistical report with: • Correlations • Comparisons of means • Reporting of statistical significance of findings | Informal narrative report |

**4. Mixed Methods Research Approach**

In mixed research, the researcher uses a mixture or combination of quantitative and qualitative methods, approaches, or concepts in a single research study or in a set of related studies. The qualitative and quantitative parts of a research study might be conducted concurrently (conducting both parts at roughly the same time) or sequentially (conducting one part first and the other second) to report a research question or a set of associated questions. Mixed researchers see positive value in both the quantitative and the qualitative views of human behaviour. They view the use of only quantitative research or only qualitative research as limiting and imperfect for many research problems. If single research makes use of both qualitative and quantitative research methods, the study is said to be mixed methods research. Creswell (2014) suggests that mixed methods research is an approach in which the researcher collects analyses and interprets both quantitative and qualitative data, integrates the two approaches in various ways and frames the study within a specific design. The mixed-method researches are of; Convergent (parallel design), Explanatory sequential (Quan-Qual), Exploratory sequential (Qual-Quan), Embedded intervention design.

To conclude, qualitative research and quantitative research share the same patterns, structures, steps, procedures, principles, methods, techniques, and are used synonymously. Depending upon the desired outcome of the research, social scientists may choose between quantitative or qualitative designs. Since they seek to explain events from different perspectives, both are valid ways to evaluate a phenomenon in the proper context. The fundamental divergence between qualitative and quantitative inquiries lies in the logic of justification, not methods as techniques. The two methodologies in question were developed from two completely different ontological and epistemological perspectives and represent two distinct worldviews or paradigms (Silverman, 2004). Guba and Lincoln (1994) state that paradigms represent one''s set of basic beliefs and as such must be accepted simply on faith. These research types differ in terms of treatment of data but are not mutually exclusive. The way a researcher decides to collect, analyse, and interpret the data determines either research is qualitative or quantitative.

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# Research and Style Manual

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**Abstract**

A style manual provides the writing rules for this particular academic discipline.This style manual has been developed to assist students in the preparation of research papers and honor thesis.Style guides must now cover every channel, from print to web to social media. With interactive media channels, style guides help to define the experience and interactions that are consistent with a brand.There are several different styles used in research with style manuals for each style. Only three of the styles are shown here. The three that are shown below are styles which are frequently used in colleges and universities.style manual fundamentally is used to locate rules about how to present the form and shape of your paper; however, some style manuals include sections about how to approach the subject matter of your research paper.

**Keywords**.Style,Provid,Particular,Research,Approach

**Introduction**

This style manual has been developed to assist students in the preparation of research papers and honor thesis. Style manuals are books that illustrate how to correctly format and record information. They are most frequently consulted for information on formatting citations, but they also include a variety of other information that is useful for research, including where to find information for the bibliography, general rules of punctuation, formatting footnotes, spacing, indention, form of author's name, etc.

Style guides are nearly as old as publications themselves. For print publications, style guides were necessary to establish consistent usage of language and layout across several different contributors. Style guides must now cover every channel, from print to web to social media. With interactive media channels, style guides help to define the experience and interactions that are consistent with a brand.

**Purpose of Style Manual**

The purpose of such guides as these is to impress upon students the importance of their developing a systematic and uniform approach to the preparation and submission of professional work.

A style manual provides the writing rules for this particular academic discipline. When you follow those rules, you can produce a work whose form is recognizable by other readers in the discipline. When all members of a discipline write professional articles in a common form, they can more easily understand one another. The style manual helps keep the members of a discipline in touch with one another

There are several different styles used in research with style manuals for each style. Only three of the styles are shown here. The three that are shown below are styles which are frequently used in colleges and universities.

Bookstores

Reference section of academic libraries

The reference section of some public libraries

**Importance of Style Manual**

A style manual provides the writing rules for this particular academic discipline. When you follow those rules, you can produce a work whose form is recognizable by other readers in the discipline. When all members of a discipline write professional articles in a common form, they can more easily understand one another. The style manual helps keep the members of a discipline in touch with one another.

Following the manual will cause you to present your paper in a consistent and readable form. Each manual will include information such as how wide your margins should be, how to present tables or illustrations, how to cite research within the text of the paper, what to document, how to abbreviate, and whether to write numbers as words or figures. The manual will explain how and when to make title pages and how to write headings within your paper. For example, if you have several sections in the main body of your paper, you may want to put a heading before each section. The style manual will tell

you whether to capitalize that heading or whether to center it. When you use a style manual, your writing style will be consistent throughout your paper; it also will be understandable to the reader because your reader also will be a scholar who knows these standards.

Remember that your style manual fundamentally is used to locate rules about how to present the form and shape of your paper; however, some style manuals include sections about how to approach the subject matter of your research paper. Those sections often review how to select a topic, use the library, compile a bibliography, and take notes. Although these sections are not exhaustive, they may provide enough guidance for you to get started on your paper.

Usually, you will not use the manual to create the ideas in your paper; you will use it to determine form. Because you concern yourself with form after you generate content, you may not consult the style manual until you reach the final drafts of your paper. If you try to make your rough drafts conform to the style manual, you may slow down your creative process and interrupt your good thinking. If you are writing your first research paper and never have used a style manual before, wait until you reach the last stages of writing before you consult one for rules of form. At that point you will be ready to discover how to write headings, present numbers, create bibliographies, etc.

If, however, you are writing a thesis or a long research paper, you may want to consult the manual earlier so you do not have to rewrite parts of your paper. For example, if you consult the manual for bibliographic form, you can record your sources correctly as you go. When you finish your paper, you will not have to rewrite your bibliography (which can be several pages long) or go back to the library to search for bibliographic information you did not retrieve when you had the source. Graduate students will do themselves a favor by using a single style manual consistently throughout their graduate work so they can become familiar with the style requirements before the students begin their thesis work.

Choose a style manual according to your purpose. If you are writing an article for an academic journal, select the style used by that journal. If you are writing for a professor, ask her/his preference. Generally speaking, if you are writing behavioral, scientific, or social scientific research, use APA. If you are writing artistic or humanistic work, use MLA. Keep in mind that these are not the only two styles available; you may select the style that best fits your preferences and those of your reader.

**Why do we use style manuals?**

Style manuals standardize the way to format a paper, including what style and size font to use, how big to make the margins, where to type your name, and how to organize your references.

They also standardize how to document borrowed material, which includes quotations, summaries, and paraphrases. By regulating how to format a paper and to document sources, each style manual makes it easy for students and professors to read papers, journal articles, and book chapters in their disciplines. It makes collaboration easier. Clear citations and references can help a reader find additional resources for research.

Finally, style manuals help writers avoid plagiarism. Because style manuals include the rules for signaling the use of borrowed ideas in writing, they ensure that writers properly indicate which ideas are their own and which come from other sources.

**Why are style manuals so complicated to use?**

Many writers find the rules of the style manuals overwhelming, confusing, and downright frustrating. It often seems that the rules about citations, references, commas, periods, capital letters ... were invented by some cruel academics with too much time on their hands. However, every rule serves an important purpose and must be followed. Every rule helps the readers decode the paper quickly and correctly. It is a sign of professionalism and respect for your reader that you should carefully follow the style of your discipline.

**Which style manual should you use?**

When you write a paper using borrowed sources, you will need to follow a style manual. If you are not sure which manual to use, ask your instructors for guidance. They can tell you which manual is standard for the discipline in which you are writing.

**How can you get help with the style manuals?**

1.Bierce Writing Commons consultants can help you learn how to use the different style manuals correctly. Come to your writing session with specific questions about formatting and documenting, and a consultant will help you learn how to navigate the style manual of your choice.

2.Become familiar with the online version or print version of the style manual you will use. See below for specifics of each manual.

**Types of Style Manual**

**Associated Press Stylebook**

The Associated Press Stylebook, alternatively titled The Associated Press Stylebook and Briefing on Media Law, is a style and usage guide for American English grammar created by American journalists working for or connected with the Associated Press journalism cooperative based in New York City.

**The Chicago Manual**

The Chicago Manual of Style is a style guide for American English published since 1906 by the University of Chicago Press. Its 17 editions have prescribed writing and citation styles widely used in publishing.

**APA (*American Psychological Association*)**

The Publication Manual of the American Psychological Association (*APA*) can also cater to academic writers within the humanities, such as social science, health

**Conclusion**

A style manual provides the writing rules for this particular academic discipline. Without knowing the importance of style manual one can not write research paper or thesis. AS researchers or scientist he should know the purpose and importance of style manual.

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# Synopsis Writing
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**Abstract -:** Synopsis is a short summary of your research work.The research synopsis is the plan for your research project. It provides the rationale for the research, the research objectives, the proposal methods for data collection and recording formats and questionnaires and interview guides.
**Keywords:** Synopsis, Research work, Research objective

**Introduction-**

A research synopsis is a short outline of your research thesis.It has the steps you propose to follow in order to achieve them.  It gives you and your supervisor a clear view of what the research aims at achieving and within what time frame. It also helps you stay focused and makes the research work generally less tedious. This explains why your synopsis should be approached with clarity, systematically with unambiguous sentences.

Synopsis is the gist of your planned project submitted for approval from competent authorities. It gives a panoramic view of your research for quick analysis by the reviewers.

**What is synopsis?**
● Synopsis is to be considered as a detailed summary of the work with important results highlighting the original contributions in the thesis to be submitted.
● It should give an outline of the thesis.
● The review of earlier work is to be minimized with  enough to highlight the contributions in the research work to be reported in the thesis.
● Deciding the path of investigation.
● Looking towards required resources.

**Meaning of research Synopsis:**
● Synopsis is the blueprint of future research work.
● Synopsis is a brief summary of proposed research work.
● Synopsis is the outline, framework peer the proposed research work on a selected topic.

**Purpose of writing research Synopsis:**
● A synopsis is a communication device which provides the required information about the proposed research work to a layman reader.
● The goal of the research synopsis is to present and justify the research idea you have.
● It serves as a plan of action.

**Format of a research synopsis:**
The preparation of a research proposal or synopsis is an important step in the process of research. There are various steps in formulating a research proposal.
The following categories of information should appear in a research proposal.
1.Statement of the title of the problem. (Cover Page)
2.Introduction
3.Review of Literature
4.Problem Definition
5.Significance of the study
6.Objectives of the study
7.Hypothesis of the study
8.Limitation of the study
9.Operational Definition
10.  Research Methodology
11.  References

**1.Statement of the title of the problem**: The front page (Cover page) of the synopsis should contain the following information.  Research title, Name of the university, name of the degree, the subject

discipline, name of the research scholar, name of the supervisor with designation, institute and qualification should be written on the first page of the synopsis.

Topic of the research synopsis –

● Topic should be interesting and show the curiosity

● The title should not be too lengthy.

● It should be specific to the area of the study.

● It should give sufficient information about the nature of the study.

**2.Introduction**: In this section the researcher introduces the problem briefly. Further, the researcher will spell out as to how the problem emerged, its social and educational context and its importance to the field. Here the researcher specifically deals with justification for conducting the proposed study. Introduction should contain a brief background of the selected topic. It must identify the importance of study, its relevance and applicability of results. It must clearly state the purpose of the study.

**3.Review of Literature**: Review of literature is a very important part of a research project. The purpose of review of literature are as follows.

●     It describes the work done by others either at local or international level on it or similar subject.

● It helps the researcher to understand the difficulties faced by others and the corrective steps taken or modifications made by them. The researcher can anticipate similar or additional problems during the study and review of literature helps him in anticipating them.

● Research methodology of the researcher can be structured and modified after reviewing the literature.

● Review of literature in a synopsis helps the reviewer in assessing the knowledge of the researcher. The reviewer can assess the work put in by the researcher and also assists in assessing the feasibility of the study.

● Find the gap between the existing tradition and concerned area of research.

● To focus on theoretical and practical aspects.

● It is essential to plan further research efficiently and in an appropriate manner.

● The information given in the review should be supported by references

Review of literature can be reviewed by using various scientific information – gathering methods. These are journals, national or international bulletins of organizations etc.

**4.Problem Definition**: In this section the researcher explains what you wish to do in broad sense and elaborate the title. Statement of the problem is primarily an expansion of the title of the problem. It is the explanation of the title or theme highlighting the scope and area of the study.

**5.Significance of the study**: Researcher should mention relevance of the research work. Explain why research is important in the context of existing knowledge. As well as elaborate contributions of knowledge. Describe how your study fills gaps or extends existing understanding in the field.

**6**. **Research Objectives**: Objectives are the basic foundations of the research, as these guide the entire process of research. The list of objectives should not be too lengthy and ambiguous. The objectives should be stated clearly to indicate what the researcher is trying to investigate.

Follow the following points while formulating research objectives.

● Present both the broad and specific objectives.

● Begin each objective statement using to….

● Use numerals instead of bullets for presenting the objectives.

● Prepare objectives closely related to the title.

● The KEYWORDS used in the title should reflect your objectives.

● Objective should start with an action verb and be sufficiently, specific, measurable, achievable, relevant and time bound.

● Use infinitive verbs such as analysis, examine, compare, evaluate, determine, compute, etc. in the objective statements.

● Present objectives in a logical sequence

● Don't use uncommon abbreviations in the objective statements.

**7.Hypothesis Formulation**: a hypothesis is crucial in a research synopsis as it forms the foundation for investigation. It provides a clear, testable statement that guides the research process, helping researchers focus on specific objectives and outcomes. A well-defined hypothesis enhances the structure of the study, facilitating meaningful analysis and interpretation of results.

❖Hypothesis is an assumption or supposition that needs to be tested empirically.

❖It is a statement containing only one sentence.

❖  Hypothesis should be testable.

❖  The assumption we wish to test is called the null hypothesis.

❖ Alternate hypothesis is opposite of null hypothesis.

❖ Null hypothesis is symbolized as H    0 and alternate hypothesis is denoted by H1.

❖ Title, objectives and hypothesis should be in sync.

❖ A good hypothesis must be testable, have explanatory power, state the expected relationship between variables.

**8**.**Limitations of the study**: Every research has its limit and these limitations arise   due to restrictions in methodology or research design. In this section mention scope limitations, Data limitation, Time constraints, Resource constraints in detail. Limitations point out strengths & weaknesses of the research.

**9.Operational Definition**: A researcher must define how a vague term will be measured. It is the definition of a term specifically telling now it will be measured.  Every research study involves certain key or technical terms which have some special connotation in the context of the study.  An operational definition is one which ascribes meaning to a concept by specifying the operations that must be performed in order to measure the concept.

**10**. **Research Methodology**: It means a plan of work describing the various aspects of the study in a logical sequence along with the methodologies to be employed.

The methodology should cover the following aspects.

i) Research Design

ii) Sample Design

iii)Variables

iv)Data Collection

v)  Tools & Techniques of data collection

vi)Data Analysis

**i)Research design** – Research design is the framework of research methods and techniques chosen by a researcher to conduct a study. There are many ways to classify research designs.

❖ Descriptive Research Design- Observing and describing a phenomenon without influencing it.

❖ Experimental Research Design – Investigating cause and effect relationships by manipulating variables and observing the effects.

❖ Exploratory research design is a methodology approach that investigates research questions that have not previously been studied in depth.

❖  Causal research is also known as explanatory research. Its type of research that examines if there is a cause and effect relationship between two separate events.

**Qualitative and Quantitative Research:**

**Qualitative Research –** Qualitative data is information that cannot be counted, measured or easily expressed using numbers. It is collected from text, audio and images and shared through data visualization tools, Qualitative data is interpretation based, descriptive and relating to language.

**Quantitative Research** – Quantitative data is number based, countable, or measurable. Quantitative data tells us how many, how much or how often in calculations.

**ii)Sample Design**- Sampling is selecting a sample of appropriate size for the study. The sample size depends on the study design. The study population can be the population of cases, the population of recipients of certain treatment.

There are two types of sampling methods.

Probability sampling involves random selection, allowing you to make strong statistical inferences about the whole group.

Non- Probability sampling involves nonrandom selection based on convenience or other criteria, allowing you to easily collect data.

**Probability sampling** –

❖ Simple Random Sampling – In simple random sampling technique, every item in the population has an equal and likely chance of being selected in the sample.

❖ Systematic sampling – In the systematic sampling method, the items are selected from the target population by selecting the random selection point and selecting the other methods after a fixed sample interval.

❖Stratified sampling – In a stratified sampling method, the total population is divided into smaller groups to complete the sampling process.

❖Clustered sampling – In the clustered sampling method, the cluster or group of people are formed from the population set.

**Non- Probability sampling-**

❖ Convenience sampling – In a convenience sampling method, the samples are selected from the population directly because they are conveniently available for the researcher.

❖Purposive or Judgmental sampling – In purposive sampling, the samples are selected only based on the researcher's knowledge. It is also known as judgmental or authoritative sampling.

❖Quota sampling – In the quota sampling method, the researcher forms a sample that involves the individuals to represent the population based on specific traits or qualities.

❖Snowball sampling – Snowball sampling is also known as a chain –referral sampling technique. In this method the sample has trails that are difficult to find. So each identified member of a population is asked to find the other sampling units. Those sampling units also belong to the same targeted population.

**iii) Variables**- Variables are the factors that can change. These changes can affect the outcome of a research project. In research, variables are crucial components that help to define and measure the concepts and phenomena under investigation. Variables are defined as any characteristics or attribute that can vary or change in some way.

**Types of variables-**

● Independent Variables- These are the variables that can be manipulated by the researcher and the effects of that are observed on the other variables.

● Dependent Variables – The changes occur as a result of independent variables.

● Control Variables – Variables that are held constant throughout the experiment.

● Intervening variables – These may influence the effect of independent variables on the dependent variables.

**iv)Data collection** – Data collection process is a well thought out approach of collecting both baseline data as well as data that can provide clues to the root cause. Data collection methods are techniques and procedures used to gather information for research purposes. These methods can range from simple self-reported surveys to more complex experiments and can involve either quantitative or qualitative approaches to data gathering.

**Primary data collection methods –** Primary data is collected from first-hand experience and is not used in the past. Primary data refers to the first-hand data gathered by the researcher himself. They are often collected through field surveys, questionnaires etc.

**Secondary data collection methods** – Secondary data means data collected by someone else earlier. The secondary data is the data that is obtained from the journals and other databases that are usually prepared and available as open – source data.

**Tools and techniques of data collection** (Data collection Instruments)-

Tools are the instruments used to collect information for performance assessments, self-evaluations and external evaluations. It is defined as a testing device for measuring a given event. For e.g questionnaire, observation, interviews etc.

**Methods of Primary Data collection –**

● Interviews- Interviews are conducted either face to face or by means of telephonic conversations between two individuals together the relevant information for the research.

● Questionnaires – The questionnaire tool is used to collect primary data by gathering the required information from the individuals by asking them the questions and giving them suitable prompts to conduct the study.

● Surveys – Surveys are conducted time to time by government agencies or businesses together relevant information from the general public.

● Observation – Researchers often observe the direct information required for the study.

**Methods of secondary data collection**–

● Research Journals – Journals published by several institutions can be a reliable source of secondary data as already several studies have been performed and published using the same set of data. Collecting information from books, journals, articles or academic publications relevant to the topic.

- Public Records – Extracting data from public records. This might include government database, official reports or statistical publications.
- Online database – Utilizing online database like research portals, statistical repositories or industry specific sources.

**v) Data Analysis** – Data analysis is an important part of a research project. A good analysis leads to good results. The main purpose of data analysis is to draw conclusions on specific data. Researchers use these results to draw conclusions on their study. Data analysis is used to make purposeful discoveries, suggest conclusions, support decision making.

12. **Reference –** All references quoted in review of literature and anywhere else in the synopsis should be listed here. It is essential that researcher should report all the authors(books, Titles etc.) in the text of proposal at the end, in the reference section. Books and consulted should also be mentioned in this section. The references in research paper are usually in the form of a list at the end of the paper.

**Conclusion –**Synopsis writing is an important step in a research project. A good synopsis will give maximum information in minimum words. Preparation of synopsis is the first stage of research work. So the research should work tirelessly to prepare the synopsis.

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# The Role of Modern Librarians in the Digital Age

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**Abstract:**

• This research paper examines the transformative journey of librarianship in the digital age, where traditional custodians of books have evolved into dynamic professionals navigating an expansive landscape of digital resources. As technology reshapes the information landscape, modern librarians find themselves at the forefront of information access and literacy. This study employs a mixed-methods approach, incorporating qualitative interviews, quantitative surveys, and observational research to comprehensively explore the multifaceted responsibilities and challenges faced by modern librarians. The literature review traces the historical evolution of librarianship, providing a theoretical foundation for understanding the contemporary librarian's role. The evolving definition of modern librarians encompasses their role as curators of vast online repositories, facilitators of digital literacy, and pioneers in technology integration. This research aims to shed light on the pivotal role of modern librarians in ensuring equitable access to information and promoting lifelong learning in the 21st century.

## • Introduction:

• In an era characterized by rapid technological advancements, the role of librarians has undergone a profound transformation. The traditional image of librarians solely as custodians of physical collections has evolved into a dynamic narrative where librarians play a pivotal role in navigating the digital landscape. This research paper aims to delve into the multifaceted responsibilities and challenges faced by modern librarians, emphasizing their critical position in fostering information access and literacy in the 21st century.

• Libraries, once considered quiet repositories of books, are now bustling hubs of digital information. As technology reshapes the information landscape, librarians find themselves at the forefront of ensuring that users can seamlessly navigate the vast realms of digital resources. This transition necessitates an exploration of the evolving role of librarians in adapting to and harnessing digital tools to meet the changing needs of their communities.

## • Definition:

• Modern librarians are dynamic professionals who extend beyond the traditional boundaries of their profession. They curate, organize, and disseminate information in a multitude of formats, embracing digital platforms and technologies. Beyond the archaic notion of librarianship solely centered around bookkeeping, modern librarians are adept at navigating a complex web of digital resources. They are not just keepers of knowledge; they are enablers, empowering users to harness the full potential of the digital age.

• In the digital era, librarians serve as gatekeepers to vast online repositories. They curate digital collections, ensuring the preservation and accessibility of valuable resources. The role encompasses the management of e-books, online journals, multimedia materials, and other digital assets, requiring a skill set that extends far beyond the traditional duties of yesteryears.

## Methods:

• To unravel the intricacies of the modern librarian's role, this research employs a comprehensive mixed-methods approach. Qualitative interviews with librarians from diverse institutions provide insights into the nuanced challenges they face and the innovative strategies they employ. Concurrently, quantitative surveys gauge the extent of technology integration, exploring how digital tools shape the day-to-day activities of modern librarians.

• Observational research within library spaces, both physical and digital, complements the interview and survey data. Analyzing user engagement with digital platforms offers a practical lens through which to understand how modern librarians facilitate information access. By combining these methods, this research seeks to provide a holistic understanding of the multifaceted nature of contemporary librarianship.

## Review of Literature:

• The literature review embarks on a historical journey through the evolution of librarianship, tracing the seismic shift from print to digital. A detailed examination of scholarly works elucidates the

challenges posed by the information age, shedding light on studies related to information literacy, technological integration, and the shifting demographics of library users.

• Key contributors such as exploration of the contemporary librarian's role in a sea of digital information. Their seminal works provide a theoretical foundation, addressing the challenges and opportunities arising from the intersection of technology and librarianship. Recent literature emphasizes critical themes, including the librarian as a facilitator of digital literacy, the impact of open-access resources on collection development, and the librarian's evolving role in fostering inclusivity in a digital landscape.

• As librarians navigate emerging technologies like artificial intelligence and grapple with the intricacies of data management, the literature review provides a roadmap to understand the expanding skill set required for modern librarians. The synthesis of historical perspectives and contemporary insights forms a comprehensive backdrop for delving into the complexities of the modern librarian's role in the digital age.

### The Role of Modern Librarians in the Digital Age: A Perspective from India

• In the rapidly evolving landscape of information and technology, this research paper delves into the multifaceted responsibilities of modern librarians in India. As a country with rich cultural diversity and a burgeoning technological landscape, the role of Indian librarians in the digital age is particularly dynamic. Employing a mixed-methods approach, including qualitative interviews, quantitative surveys, and observational research, this study aims to provide a comprehensive understanding of the challenges and opportunities faced by modern librarians in India. The literature review not only traces the global evolution of librarianship but also explores the unique socio-cultural and technological aspects that shape the role of Indian librarians. The findings are expected to shed light on how modern librarians in India navigate the complexities of a digitalized information landscape, ensuring the accessibility and relevance of information in a rapidly changing society.

### 1. Bridging the Digital Divide:

• In India, where disparities in access to technology persist, modern librarians play a crucial role in bridging the digital divide. Through initiatives such as digital literacy programs and access to online resources, librarians contribute to empowering diverse communities with the skills necessary to navigate the digital world.

### 2. Preservation of Cultural Heritage:

• Indian libraries house a wealth of cultural and historical artifacts. Modern librarians, leveraging digital technologies, are at the forefront of preserving and digitizing rare manuscripts, ancient texts, and historical records. This preservation effort not only safeguards cultural heritage but also enhances global access to India's rich intellectual legacy.

### 3. Multilingual Information Access:

• With India being a linguistically diverse nation, modern librarians grapple with the challenge of providing information access in multiple languages. Librarians play a pivotal role in curating and organizing digital resources in various languages, ensuring that users across linguistic backgrounds can engage with information seamlessly.

### 4. Open Access Advocacy:

• In alignment with the global movement toward open access, Indian librarians advocate for freely accessible scholarly information. They actively participate in the creation and promotion of open educational resources, contributing to the democratization of knowledge and fostering a culture of information sharing.

### • 5. Community-Centric Technology Integration:

• Indian librarians recognize the importance of tailoring technology integration to meet the specific needs of their communities. They are pioneers in implementing community-centric technology solutions, such as mobile library services, to reach underserved areas and engage diverse populations in the digital realm.

• This research aims to not only illuminate the challenges faced by modern librarians in India but also celebrate their innovative approaches in leveraging digital tools to enrich the information landscape and empower communities across the subcontinent. Through a detailed exploration of these facets, this study contributes to a broader understanding of the pivotal role played by modern librarians in India's digital age.

• Certainly! For the sake of this example, I've provided generic author names. Please replace them with the actual names of the authors and ensure consistency with the citation style you are using. Here's the modified references section:

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# Types and Procedures of Experimental Research Designs
## Dr.Rupali S.Talegaonkar

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**Abstract:**

When a good conclusion is eventually reached, the expenditures of experimental research may occasionally exceed the prospective advantages or profits. It complies with the researcher's stringent guidelines. This kind of research strategy is common in social science, medical science, and scientific studies. This is not so much theoretical research as it is field investigation. It involves multiple steps. A testable hypothesis must be stated, a research question must be formulated, intervention conditions must be developed or chosen, a sample of the population must be assigned to experimental conditions, and the empirical measures (and data recording procedures) must be decided upon. The experimental design, the kind of data collected, and the statistical technique that will be applied to assess the data are often closely related and vitally related.

**Key words:** . The experimental design, research strategy, data recording procedures

**Introduction:**

The ultimate goal of research is to help decision-making by the methodical and organized collection, arrangement, and analysis of evidence. It's a deliberate way of approaching a subject in study, coming up with a solution, or learning something new. Depending on the context, issue, or inquiry kind, there are different forms of research. Research also includes developing a new weapon for a tactical advantage in combat or figuring out the covert cause of an area's increased crime rate. These two study examples are completely different from each other. The research design requires making a number of challenging but crucial decisions. It is up to researchers to decide which research issues to tackle, whose theoretical framework will guide the investigation, how to accurately and reliably measure key constructs, and who or what to sample and observe, how many subjects/locations/things must be sampled to obtain sufficient statistical power, and which data analytic techniques will be used. Research of all kinds, including exploratory, experimental, descriptive, and evaluational research, must address these issues.The present work aims to provide definitions for the terms "Experimental Research," "Design-Types," and "Process."

**Definition of Experimental Research**

Experimental design is the process of carrying out research in an objective and controlled fashion so that precision is maximized and specific conclusions can be drawn regarding a hypothesis statement. (Bell, 2009) .It is a scientific method of conducting research in which one or more independent variables are altered and applied to one or more dependent variables in order to determine their influence on the latter. It is an attempt by the researcher to maintain control over all factors that may affect the result of an experiment. In doing this, the researcher attempts to determine or predict what may occur. The experimental design is described in statistics as the design of an information-gathering experiment in which a variation is present or not, and it should be executed under the researcher's complete control. This word is commonly used to describe controlled experiments. To maximize the dependability of the results, these tests minimize the impacts of the variable. In this design, an experimental unit's process may comprise a group of people, plants, animals, and so on. An experimental design consists of two groups of subjects.

- Experimental Group – It undergoes treatment,programme, or intervention of interest.
- Control Group -A predetermined set of diverse circumstances is placed on the individuals chosen for the experiment during the manipulation procedure. The collection of different circumstances is known as the independent variable, experimental variable, or treatment variable .
- Experimental Group- It undergoes treatment, program, or intervention of interest.
- Control Group- A predetermined set of diverse circumstances is placed on the individuals

**Types of Different Experimental Design :**

A method design that makes it possible for the researcher to test his hypothesis by determining the relationships between the independent and dependent variables with confidence. It alludes to the conceptual structure that the experiment is conducted inside. Creating studies with substantial causal (internal) validity is the main objective of experimental research. Randomized experimental designs

provide the highest levels of causal validity. Three primary categories of experimental study designs exist. As follows:

• Pre-Experimental

• **Pre-experimental**

The pre-experimental research design is the most basic type of experimental research design in statistics. In this approach, after identifying specific elements as the cause and effect, a group or groups are maintained under surveillance. This approach is typically used to determine whether more research is necessary for the target population. Because of this, this procedure is seen as being efficient. In a pre-experimental research design, one or more dependent groups are examined for the effect of an independent variable that is assumed to cause change. It is the most basic type of experimental study design and has no control group.

• **True Experimental**

• True-Experimental

This is the most accurate form of experimental research design as it relies on the statistical hypothesis to prove or disprove the hypothesis. This is the most commonly used method implemented in Physical Science. True experimental research design is the only method that establishes the cause-and-effect relationship within the groups. The factors which need to be satisfied in this method are:

▪ Random Variable

▪ Variable can be manipulated by the researcher

▪ Control Groups(A group of participants is familiar with the experimental group,but

♣Random variable

♣Variable can be manipulated by the researcher

♣Control Groups (A group of participants is familiar with the experimental group, but the experimental rules do not apply to them)

▪ Experimental Group(Research participants where experimental rules are applied)

▪ It may be performed on at least two randomly assigned dependent subjects with or without a pretest. A true experimental research design must have a control group, a

variable that can be modified by the researcher, and a random distribution.

♣Experimental Group (Research participants where experimental rules are applied)

♣It may be performed on at least two randomly assigned dependent subjects with or

• **Quasi-Experimental**

Quasi-Experimental

"Quasi" indicates "partial," "half," or "pseudo." As a result, quasi-experimental research resembles but is not the same as actual experimental research. In a true experiment design, the participants of the group are randomly assigned. So, every unit has an equal chance of getting into the experimental group. In a quasi-experimental design, the participants of the groups are not randomly assigned. So, the researcher cannot make a cause-or-effect conclusion. Thus, it is not possible to assign the participants to the group. Because participants in quasi-experiments are not assigned at random, they are applied in cases where randomization is difficult or impossible. This is prevalent in educational research, as administrators are hesitant to allow students to be chosen at random for experimental samples. Time series, no corresponding control group, and counterbalanced designs are all instances of quasi-experimental research designs.

There are some other types that are less used. Such as:

• Between- Group Design

• Between-Group Design

A study design in which two or more groups subject to different experiences or treatments are compared. The purpose is to make statistical comparisons between two or more groups and demonstrate a causal relationship between the independent variable and the outcome of interest.

• Individual/within Group Design

• Individual/Within Group Design

A study design in which each participant is studied at all levels of the independent variable that researchers can manipulate. Different conditions and outcomes are then compared within each subject to determine the effect of the manipulated variable

• Completely randomized Design

• Completely randomized design

Of all the types, the simplest type of experimental design is the completely randomized design, in which the participants are randomly assigned to treatment groups. The main advantage of using this method is that it avoids bias and controls the role of chance. This method provides a solid foundation for Statistical analysis as it allows the use of probability theory.

**Characteristics and features of Experimental Research :**

The main characteristic that sets experimental research apart is the active manipulation of an independent variable. The objective observation of a phenomena created to occur in a highly controlled environment where one or more variables are methodically changed through manipulation sets experimental research apart. Various attributes include:

➤ Variables

In experimental research, variables that are extraneous, independent, and dependent are all present. The variables that are being modified or handled as dependent variables are often commonly referred to as the study subject. The independent variables serve as a representation of the experimental treatment being applied to the dependent variables. On the other hand, extraneous variables are external impacts on the experiment that might possibly be responsible for the change. Multiple independent variables, such as time, abilities, test scores, etc., may be used in experimental research.

➤ Positioning

The experiment's location is known as the setting. A lot of tests are carried out in labs, where unrelated variables can be eliminated and controlled. Some tests take place in less regulated settings. The nature of the experiment dictates the kind of setting that is used in research. Except for the independent variable, the researcher must control all relevant factors.

➤ Control

In experimental research, control is the most important factor. It is impossible to infer the effects of an independent variable in the absence of control. Understanding the two guiding principles of experimental research is necessary before understanding the concept of control in experimentation.

➤ Deception

During the manipulation method, the subjects selected for the experiment are subjected to a predefined set of different conditions. The set of circumstances is known as the independent variable, the experimental variable, or the treatment variable.

➤ Observation

It is the experimenter's responsibility to note any changes in a dependent variable brought about by altering an independent variable.

**Process of experimental design :**

The process of developing a collection of techniques to methodically evaluate a hypothesis is known as experimental design. An experiment's design process consists of several stages. The following are the processes in the design of an experimental study:

➤ Defining Research Problem

In every kind of research, the first step is to identify the problem. Essentially, the goal of experimental research is to address gaps or difficulties in theory rather than practical issues.

➤ Identifying the variables :The process of defining the important variables and forecasting their interactions is necessary to convert a research topic into an experimental hypothesis.

➤ Developing a Theory: Developing a concise, testable hypothesis that is relevant to the research issue is necessary before beginning any investigation.

➤ Designing a controlled Experiment

Planning a carefully monitored study drafting an experimental strategy that takes into account all of the necessary components, circumstances, and relationships between the results Designing a controlled experiment requires:

1. manipulating the independent variable(s) systematically and precisely

2. Measuring the dependent variable(s) with precision

3. Controlling any factors that can cause confusion

Designing experimental treatments to manipulate the independent variable

• Manipulation of the independent variable can have an impact on the experiment's external validity or the extent to which the results can be extended and applied to the broader world. The first step is, to consider how widely the independent variable should be varied. The second step is, to decide how finely

to alter the independent variable. This decision is sometimes made by the experimental system, but it is often required to make one, and this will affect how much the researcher may deduce from the data. If the subjects are exposed to more than one treatment then the findings could only be generalized to individuals exposed to the same treatments in the same order of presentation . Finally, determining the collection method of data on the dependent variable outcomes.

• Measuring dependent variables:

The aim should be to achieve accurate and valid measures that reduce research bias or inaccuracy. Some factors can be best measured using scientific tools. Others may need to be operational zed prior to being measured.

Measuring dependent variables

**Purpose and fields of experimental research :**

The purpose of research design is to determine the explanations for the causes and effects of a precisely defined problem. An explanation of the link between variables is the main goal of this kind of research. The statistical method used to understand the link between the study's many characteristics is known as co relational research. For those in the sciences and many other fields, experimental research is the most popular kind of study design. Experimental design is an efficient approach of tailoring the experimental settings for SPE to maximize the quantity of relevant information acquired with the least number of tests.

Compared to the "vary one factor at a time approach with other factors assigned fixed values," it offers a more thorough and efficient optimization. Factor interactions can be accommodated by appropriate experimental designs, in contrast to "vary one factor at a time" techniques. Pole (2012)Depending on the type of experimental study design under consideration, many experimental research domains exist. the most basic kind of laboratory research that involves experimentation. It may differ in kind according on the research topic. It is applied to formulate hypotheses and conclusions regarding a subject.  Below are a few prominent applications of experimental research design.

• Medicine

Disease treatments that work are developed through experimental study. Instead of using patients as study subjects directly, researchers usually take a sample of bacteria from the patient and treat it with the newly developed antibiotic.

• Education

Aside from teaching students how to do experimental research in science areas like Chemistry and Physics, it may also be utilized to improve the level of an academic institution. This involves measuring students' understanding of various topics, developing better teaching techniques, and adopting additional initiatives to help pupils learn.

• Human Behavior

•Human Behavior

Experimental research is mostly used by social scientists to evaluate human behavior. Consider two persons who were picked at random to be the subjects of a social interaction study, one of whom was confined in a room with no human interaction for a year.

The evaluation of physical constructions, materials, and components; chemical formulations; computer programs; opinion polls; natural experiments; statistical surveys; and other applications are recognized for the use of experimental research. This study methodology enables the artificial reproduction of specific environmental conditions within the constraints of a laboratory. This approach makes it possible for the research to repeat elements that would need a significant time investment otherwise. It is a process that gives the involved researchers a considerable deal of control over potential extraneous influences, decreasing the unpredictable nature of unknown or unanticipated aspects when influencing the outcome.

**Conclusion:**

Through the use of statistical techniques, experimental design procedures enable the researcher to gain a deeper understanding of and assessment of the elements influencing a given system. These methods combine an understanding of the specific factors to be researched with a working knowledge of experimental designs (G. Hanrahan).Gibani, J. Zhu, D. G. Patil, et al. (2005). The results of this method are frequently specific and pertinent. Researchers have the ability to evaluate failure, success, or any other specific result because of the data points they collect from their work.

Because of this, it is simpler to advance any concept when using the knowledge made available by this process. During variable manipulation, a result must always be brought to its logical conclusion in order to obtain the required data.

One of the major disadvantages of experimental research is that it does not account for any ethical or moral breaches that particular variables may cause. Some factors cannot be changed in a way that is safe for individuals, the environment, or even society as a whole. When this occurs, researchers must either shift their data points to another technique, continue to provide partial findings, falsify results, or set aside their own convictions to work on the variable regardless .

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# Types Of Research Methods

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## Introduction

Research is "Creative and systematic work undertaken to increase the stock of knowledge." It involves the collection, organization and analysis of information to increase understanding of a topic or issue. A Research Project may be an expansion on past work in the field. To test the research may replicate elements of prior projects looking for new information, new understanding and new facts. A person who does research is called a researcher. Some researchers work in academia. Others researchers work for businesses for the organizations or for the governments.

## Research Needs :-

The main purposes of research are to inform action, gather evidence for theories, and contribute to developing knowledge in a field of study. This article discusses the significance of research and the many reasons why it is important for everyone not just students and scientists.

Research usually prefers to be systematic, organized, and objective, research is used in many different fields to study such as science mathematics and humanities.

## Academic Research :

Researchers take part in field or laboratory experiments, reading relevant books, journals or websites, taking notes and making conclusions.

Teaching and lecturing is only part of the job of a professor or researcher when they are not directly teaching classes they are often working on academic research learning institutions can very widely in what they expect from members of their faculty.

Most expect faculty members to set up their own laboratories. They hire their own lab employees and obtain their own funding. Often from more than one source. Academic researchers often compete for grants to fund research at their own university. The more money researchers can attract, the higher the prestige of that university.

## Scientific Research :

The scientific method is the usual way of doing this kind of research. It is meant to improve understanding of biology, engineering, physics, chemistry and many other fields. With this kind of research, scientists can understand the world and discover useful things. Money for research comes from governments, private corporation and charities. Some of these organizations combine research and development of new products and ways of doing their work.

## Basic Principles of Research :

1. **Systematic :-** From a hypothesis or working objective, researchers gather data according to a scheme set out in advance, they use the data to change ideas or add new knowledge to that already existing, the approach used in research is the scientific method.

2. **Organized :-** Members of a research group use the same definitions, standards and principles. This is part of the detailed plan.

3. **Objective :-** Conclusions from research must be based on observed and measured facts, not on subjective impressions.

## Conclusions :

Research reports are produced by many sectors including industry, education government and non government organizations and may be disseminated internally or made public however they are not usually available from booksellers or thought standard commercial publishing channels. Evaluation is a systematic determination of a subject merit, worth and significance using criteria governed by a set of standards. Evaluation is the structured interpretation and giving of meaning to predicted or actual impacts of proposals or results.

It looks at original objectives, and at what is either predicted or what was accomplished. So evaluation can be formative, that is taking place during the development of a concept or proposal, project or organization with the intention of improving the value or effectiveness of the proposal, they are considered quasi-evaluation approaches because particular studies legitimately can focus only on

questions of knowledge without addressing any questions of value. Such studies are by definition not evaluation.

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6. Research Methodology – Dr. S.  B. Adhau
 – Dr. P. Y. Choudhary

# मराठी आत्मचरित्र: संकल्पना व संशोधन

## चिंचे प्रविण हनुमंतराव

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मार्गदर्शक

## प्रा. डॉ मंदा एम नांदुरकर

मराठी विभाग प्रमुख मातोश्री विमलाबाई देशमुख महाविदयालय अमरावती महाराष्ट्र (INDIA)

## सारांश

आत्मचरित्र या वाङ्मय प्रकाराने एकुणच मराठी साहित्यात आपले समृद्ध दालन निर्माण केले आहे. विविधांगी व सकस प्रांजळपणामुळे ही आत्मचरित्रे इतर साहित्य प्रकारांपेक्षा नक्कीच वेगळी ठरली आहेत. आत्मचरित्र हा वाङ्मयप्रकारातील सर्वात सोपा व सर्वात अवघड प्रकार आहे. लेखक स्वतःची मनप्रवृत्ती, जीवन प्रांजळपणे वाचकांसमोर मांडत असतो. याला जीवघेणा साहित्यप्रकार असेही म्हटल्या जाते. लेखकाने घटना जशाच्या तशा उत्तरविणे यामध्ये अभिप्रेत असते.

**बीजशब्द:** चरित्र, आत्मचरित्र, संकल्पना, संशोधन, मराठी आत्मचरित्र

## संशोधनाची उद्दिष्टे

- आत्मचरित्राची व्याख्या अभ्यासणे
- मराठी आत्मचरित्रांचा निर्मितीप्रवास जाणून घेणे.
- मराठी आत्मचरित्रांचा संकल्पना जाणून घेणे.
- मराठी आत्मचरित्राचा संशोधनात्मक पद्धतीने अभ्यास करणे,
- मराठी आत्मचरित्रांचा मराठी साहित्यावरिल प्रभाव जाणून घेणे

## प्रस्तावना

स्वतःच्या जीवनाचे स्वतः केलेले स्वकथन म्हणजे 'आत्मचरित्र' होय. लेखक स्वतःचा संघर्ष, कर्तृत्व, जीवनदृष्टी, जीवन अनुभव, सभोवतालची परिस्थिती, तिचे स्वतःवर झालेले बरेवाईट परिणाम व्यक्त करण्याकरिता आत्मचरित्र हा वाङ्मयप्रकार निवडतो. स्वतःशी प्रामाणिक राहून निरपेक्ष, तटस्थ व वस्तुनिष्ठतेने लिहिलेली आत्मचरित्रे इतरांच्या अभ्यासास उपयुक्त असतात. मराठीत कथा कादंबरीपेक्षा आत्मचरित्रांची संख्या कमी आहे. ते लिहिणाऱ्या व्यक्तिमत्वाबद्दल माहिती मिळतेच शिवाय त्यासोबतच तत्कालीन लोकजीवन परिसर, पर्यावरण, परिस्थिती व इतर अंगाचीही जाणीव आत्मचरित्रे आपणास करून देतात. कथा, कादंबरी, नाटक यासारख्या ललित साहित्य प्रकारातील कल्पित सत्यापेक्षा जीवनातील 'वास्तवसत्य' आत्मचरित्रांद्वारा अभ्यासता येते.

## आत्मचरित्र म्हणजे काय ?

वाङ्मयेतिहासाच्या ग्रंथात 'आत्मचरित्रांना' चरित्राचाच एक उपप्रकार मानून त्यांचा आढावा अतिसंक्षिस रूपात प्रा. डॉ. प्र. न. जोशी आणि प्रा. अ.म. जोशी आदींनी घेतलेला दिसतो. ' आत्मचरित्र' या शब्दामधील 'चरित्र' हे नाम संस्कृत 'चर' धातूपासून तयार झालेले दिसते. याच धातूपासून तो चरित हा शब्दही तयार झालेला आहे. तो चरित्र या नामाऐवजी त्याच अर्थाने नाम म्हणूनही वापरला जातो.[1] आत्मचरित्राला संस्कृतमध्ये 'आत्मवृत्तकथनम्' किंवा 'आत्मचरित्रम्' म्हणतात. इंग्रजीत Autobiography किंवा Self Biography असे म्हणतात तर उर्दूत 'खुदन विश्त

सवानेह उमरी' हा शब्द वापरला जातो. मराठी व्युत्पत्तिकोशात 'आत्म = आपल्यासंबंधी स्वतःचे आपले. आत्मनिवेदन (आत्म + नि + विद्) स्वतःसंबंधी सांगणे!"[2] असा अर्थ दिला आहे. मराठीत आत्मचरित्रासाठी अनेक पर्यायी शब्द वापरले जातात. आत्मवृत्त, आत्मकथा, आत्मकथन, आत्मनिवेदन, आत्मकहाणी, जीवनकहाणी, स्वचरित्र, स्वकथन, जीवनकथा इत्यादी.

## आत्मचरित्राच्या व्याख्याः-

आत्मचरित्र म्हणजे काय ? याबद्दल विचारवंतानी काही मते मांडलीत ती पुढिलप्रमाणे :-

• "आत्मकथा म्हणजे आत्मचरित्र होय. आपल्या स्वतःच्या जीवनासंबंधी लेखक जे काही लिहितो ते आत्मचरित्र होय."[3]

• "आपल्या जीवनविषयक अनुभवांचे व तद्नुषंगाने आपल्या व्यक्तिमत्वाचे स्वतः लेखकाने लेखनरूपाने घडविलेले दर्शन म्हणजेच आत्मचरित्र होय"[4]

• "स्वतःच्या जीवनाचे दुरस्थपणाने सिंहावलोकन वृत्तीने केलेले अवलोकन आणि त्याविषयीचे प्रांजळ निवेदन म्हणजे आत्मचरित्र"[5]

• "आत्मकथा लेखक के अपने जीवनसे सम्बद्ध वर्णन है। आत्मकथा के द्वारा अपने बीते हुए जीवन का सिंहावलोकन और एक व्यापक द्वारा पृष्ठभूमिमे अपने जीवन का महत्व दिखलाया जाना संभव है।[6]

• "Autobiography, the account of an individual human life written by the subject himself"[7]

• Autobiography is only one for amount many in which writer speaks of himself and the incident of his personal experiences."[8]

वरिल व्याख्यांवरून आत्मचरित्राचे स्वरूप अधिक स्पष्ट होते.

## आत्मचरित्राची संकल्पना :-

'आत्मचरित्र' हा साहित्यप्रकार मराठीत आधुनिक समाज व्यवस्थेत 19 व्या शतकाच्या मध्यापासून रूढ झाला. तत्पुर्वीच्या म्हणजे भारतीय प्राचीन किंवा मध्य युगात 'आत्मचरित्र' ही वाङ्मयीन संकल्पना भारतीय साहित्यात नव्हती. मात्र 'चरित्र' किंवा 'चरित' ही संकल्पना रूढ होती, संस्कृत भाषेत 'हर्षचरित, रामचरित असे गब्दप्रयोग आहेत, ग्रंथही आहेत.

'चर-चरति' म्हणजे चलणे, चालणे, पुढे जाणे, चालत राहणे, चरित चा अर्थ चललेला, चाललेला असा होतो. ते नाम म्हणून घेतले तर चाललेले अंतर, चाललेली स्थितिगती, चाललेला स्थितिगतीचा आलेख किंवा नकाशा असा अर्थ लक्षणेने घेता येतो. 'आत्मचरित्र' याचा वाङ्मयीन क्षेत्रातील अर्थ मी माणूस या नात्याने जीवनात जी काही वाटचाल केली त्या वाटचालीतील माझी स्थितिगती म्हणजे सुखदुःखे, आशा-आकांक्षा, विकास विस्तार, भाव-सत्ये, कृति-कर्मे आणि या सर्वांतील यशापयश, धडपड यांचा 'मी' केंद्रस्थानी धरून काढलेला 'आलेख किंवा नकाशा' असा सर्वसाधारणपणे होतो.

## मराठी साहित्यातील आत्मचरित्रांची वाटचालः-

• वास्तविक मराठीमध्ये 1970 पासून आत्मचरित्रे तुलनेने 1970 पूर्वीच्या काळाच्या काळाच्या तुलनेने विपुल प्रमाणात लिहिली जाऊ लागली.

• 1870 नंतर मराठीमध्ये इंग्रजीमधून अनेक मोठ्या व कर्तृत्ववान व्यक्तींची चरित्रे आणि आत्मचरित्रे भाषांतरित होऊ लागलेली दिसतात.

• 1920 पर्यंतचा काळ हा प्रामुख्याने बोध व प्रबोध यांच्या प्रभावाखालचा होता. 1920 नंतर मात्र राजकिय प्रबोधन महत्वाचे ठरत गेले. साहित्यात मात्र मनोरंजनवादाचा, सौंदर्यवादाचा उदय झाला आणि त्याचा प्रभाव वाढत गेला.

• तिसरा टप्पा हा 1950 च्या आसपासचा आहे. हा स्वातंत्र्याचा काळ होता. या काळात साहित्याकडे पाहण्याचा दृष्टिकोन आणखी बदलला. परिणामी 'आत्मचरित्राकडे' ही वेगळया दृष्टीने पाहिले जाऊ लागले.

• या तीनही टप्प्यावर साहित्याकडे पाहण्याची दृष्टी बदलली. एवढेच नव्हेतर 1970 ते 1995 या पंचवीस वर्षाच्या काळात विपुल आसचरित्रे लिहिली गेली. उदा. 'स्नेहांकिता' (स्नेहप्रभा प्रधान, 1973), 'संध्याकाळ' (गजानन जागीरदार, 1971) 'रामनगरी' (राम नगरकर, 1975) 'झाले मृगजळ आता जलमय' ( दत्ता भट, 1983).

## संशोधन

मराठी 'आत्मचरित्र' हा प्रकार साहित्यातील संशोधन (Research in Literature) या संशोधन क्षेत्राअंतर्गत अंतर्भुत आहे. विसाव्या शतकात साहित्याचे समाजशास्त्र (sociology of Literatures) ही एक नवीन अभ्यासशाखा विकसित झाली. आज साहित्याचे समाजशास्त्रीय दृष्टिकोनातून अध्ययन केले जाते. व्हिको यांनी New science (1725), हर्डर (जर्मन विचारवंत), मादाम दस्ताल (1766-1817) यांनी आपल्या De la literature, या ग्रंथात साहित्यातील संशोधन व समाजशास्त्राचा अभ्यास केला.

वैज्ञानिक पद्धतीचा काटेकोरपणा अवलंब करून 'आत्मचरित्र' या साहित्यातील संशोधन करता येत नाही. तरीही साहित्यातील संशोधनात अतिशय मर्यादित प्रमाणात आणि मर्यादित क्षेत्रातच वैज्ञानिक पद्धतीचा उपयोग करता येतो. आत्मचरित्रांचे, संशोधन पद्धतीचा अवलंब करून संशोधन करण्यामध्ये काही मर्यादा आहेत हे मान्य करून देखील आत्मचरित्राचे वैज्ञानिक पद्धतीने अध्ययन केले जात आहेत.

1) साहित्येतिहास, 2) आत्मचरित्रकार व त्यांचे लेखन, 3) एक समीक्षा, 4) भाषा, 5) रचनाबंध व प्रकार, 6)आत्मचरित्राचे तुलनात्मक अध्ययन, 7) लोकसाहित्य या साहित्य संशोधनाची क्षेत्रे आत्मचरित्राला सुद्धा लागू होतात.

## समारोप

मराठी आत्मचरित्रांनी, मराठी साहित्याला समृद्ध केलेले आहे. कथा-कादंबरी, काव्य, समीक्षा ही एक लेखक अनेकदा लिहु शकतो, परंतु आत्मचरित्र, हे एक लेखक आपल्या संपूर्ण आयुष्यामध्ये एकदाच लिहू शकतो त्यामुळे इतर साहित्यप्रकारांच्या तुलनेत मराठीत आत्मचरित्रांची संख्या कमी आढळते. तरीही आधुनिक काळामध्ये आत्मचरित्र लिहिण्याचा कल वाढलेला आहे. तुलनात्मक दृष्टीने आत्मचरित्रांचे संशोधन ही वेगळया स्वरूपात होत असलेले आढळून येते.

## निष्कर्ष

• आत्मचरित्र हा मराठी साहित्याचा अविभाज्य व महत्वाचा साहित्यप्रकार असल्याचे जाणवते.

• आत्मचरित्रांच्या व्याख्या अनेक संशोधकांनी वेगवेगळया केलेल्या असल्या तरी त्यामधील मुख्य आशय एकच असल्याचे दिसून येते.

• 'आत्मचरित्र' या साहित्यप्रकाराने मराठी साहित्यावर विविधांगी व सकारात्मक प्रभाव पाडल्याचे दिसून येते.

• अलीकडे आत्मचरित्राचे संशोधन संशोधनात्मक पद्धतीने होत असल्याचे जाणवते.

• आत्मचरित्राचा प्रवास कालानुक्रमे तीन टप्प्यामध्ये जाणवतो,

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## संशोधनात सर्वेक्षण पध्दती उपयुक्तता

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**प्रास्ताविक :**

सामाजिक तव्दतच समाजशास्त्रीय संशोधनात तथ्ये शोधून त्यांचे संकलन करणे आणि नंतर निष्कर्ष काढण्याचे काम संशोधकाला करावे लागते. तथ्ये शोधतांना विविध तंत्राचा उपयोग करून घेतला जातो. काही माहिती प्रत्यक्ष अनुभवातून मिळते तर काही पुस्तक वा लिखीत स्वरूपातुन मिळते. तथ्ये संकलन करण्यासाठी जसा निरीक्षण, ऐतिहासिक आणि तुलनात्मक पध्दतीचा उपयोग केला जातो तसाच सर्वेक्षण पध्दतीचा सुध्दा उपयोग करून घेतला जातो. सर्वेक्षण पध्दत ही सुध्दा सामाजिक तथ्ये शोधून काढण्यासाठी उपयुक्त आहे. या पध्दतीत एक वा अनेक माणसांचा सहभाग असतो. व्यक्तीगत पातळीवरून एकटा संशोधक सुध्दा समाजाविषयक माहिती मिळवू शकतो. मार्क अब्राम सर्वेक्षणाची व्याख्या करतांना म्हणतो, 'समाज जीवनाच्या काही अंगा विषयी प्रशासकीय माहिती मिळविण्याच्या गरजेसाठी किंवा कार्यकारणभाव शोधण्यासाठी किंवा समाजशास्त्रीय सिध्दतांच्या काही भागावर नवीन प्रकाश टाकण्यासाठी सामाजिक सर्वेक्षण केले जाते.

**संशोधन पध्दती :–**

वेबस्टरच्या शब्दकोशात संशोधन या शब्दाचा जो अर्थ देण्यात आला आहे त्यावरून सामान्य माणसासाठी संशोधनाचा ढोबळ अर्थ काय होतो ते स्पष्ट होते. या शब्दकोशाप्रमाणे संशोधन म्हणजे, तथ्ये वा तत्वे शोधण्यासाठी करण्यात येणारी चिकित्सा किंवा परीक्षण ; किंवा एखादी गोष्ट शोधून काढण्यासाठी सतत व पध्दतशीर केलेले परिश्रम होय.

संशोधनाच्या खालील तीन प्रमुख पध्दती आहेत. या पध्दती भूतकाळ, वर्तमानकाळ आणि भविष्यकाळ अशा काळ तंत्रानूसार पडतात यावरील संशोधनाच्या पध्दतीबाबत सविस्तर माहिती पुढील प्रमाणे.

**१)   ऐतिहासिक पध्दती : –**

घटनांबाबत जे संशोधन करण्यात येते आणि त्याकरिता ज्या वैज्ञानिक किंवा शास्त्रीय पध्दतीचा उपयोग करण्यात येतो त्याला ऐतिहासिक पध्दती असे म्हणतात. विषय निश्चिती, संबंधीत साहित्याचे समीक्षण, मार्गदर्शक अभ्यास, परिकल्पनेची निश्चिती, संशोधन साधनांची सुधारणा, संशोधन कार्यक्रम, जमा केलेल्या माहितीची वस्तुनिष्ठ नोंद, निशदीकरण, निष्कर्ष व त्यातून परिकल्पनेची फलश्रुती या वैज्ञानिक पध्दतीच्या सर्व पायऱ्या ऐतिहासिक संशोधन पध्दतीत वापरल्या जातात.

**२)   वर्णनात्मक पध्दती   : –**

एखाद्या स्थितीच्या, व्यक्तीच्या वा गटाच्या वैशिष्ट्यांचे अचुक किंवा वस्तुस्थिती निदर्शक वर्णन करणे हे या पध्दतीची वैशिष्टये होय. वर्णनात्मक संशोधनात समस्या निश्चिती, आदर्शाची निश्चिती आणि वस्तुस्थिती पासून महत्वपूर्ण बाबी समाविष्ट असतात वर्णनात्मक पध्दतीचे पुढील  प्रकार आढळून येतात''

वर्णनात्मक पध्दतीच्या प्रकारातील संशोधनाचे सूत्र समान असते समस्येला अनुसरून संशोधनाच्या पायऱ्यात जो अल्पसा फरक आहे त्यामुळे हे प्रकार सुचविण्यात आले आहेत.

**३)   प्रायोगिक पध्दती   : –**

निरनिराळ्या चलामधील कार्यकारण संबंधाबाबत मांडण्यात येणाऱ्या गृहीतकांची चाचणी घेणे हे या संशोधनाचे उद्दिष्ट होय. या प्रकारच्या संशोधनाला प्रयोगात्मक संशोधन असे म्हणतात या पध्दतीत  काय होऊ शकेल किंवा व्हावे? अशा भविष्य काळातील घडामोडीशी संबंधीत अध्ययन करण्यात येत असते. तसेच *च.ङ.घराश्रशीह* यांच्या मते *क्लीीाँीळलरश्र गीवळशी , ीीाा॓शू, हिळश्रीहिळळरश्र ीशिशरीलह शींल. रीश ीरीळी शिहेवी 'ष वशीलीीळळीश ीशिशरीलह* .रा.ना. घाटोळे यांच्या मते , 'सर्वेक्षण हे समस्येचा शोध घेणे तसेच त्याच्या निराकरणाचा प्रयत्न करणे या हेतुने निर्माण झालेली एक वैज्ञानिक पध्दत आहे. त्याचप्रमाणे सर्वेक्षण पध्दतीची वैशिष्टये पुढीलप्रमाणे आढळून येतात.

सर्वेक्षणा पध्दतीचे विशेष :

- विवक्षित स्थान
- प्रत्यक्ष अध्ययन
- वर्तमान परिस्थिती
- अभ्यास पध्दती
- तुलनात्मक अभ्यास
- वस्तुनिष्ठता
- उपाय,योजनात्मक स्वरूप

सर्वेक्षण पध्दतीत प्रामुख्याने तथ्ये गोळा करण्यावर भर दिला जातो.

### सामूहिक कार्य :

सर्वेक्षण हे असे तंत्र आहे की त्यात एका व्यक्तीने सर्वेक्षण करणे शक्य नसते. अनेक व्यक्तीच्या साह्याने सर्वेक्षण केले जाते.

### सर्वेक्षणाचा अभ्यास विषय :

सर्वेक्षण पध्दतीत व्यापक प्रमाणात तथ्ये संकलित करण्याची क्षमता आहे. अभ्यास विषयी केवढाही व्यापक असू द्याकी भौगोलीक क्षेत्र कितीही विशाल नी विस्तृत असू द्या. सर्वेक्षण पध्दतीला येथे कोणत्याही प्रकारची मर्यादा नसते.

१)    **लोकसंख्या :**

सामाजिक सर्वेक्षणात प्रामुख्याने लोकसंख्येचा अभ्यास केला जातो. लोकसंख्येचे परिणमा आणि स्वरूप, लोकसंख्येची प्रदेशावर विभागणी, गतिशिलता, जन्म, मृत्यु, स्थानंतर, वय लिंगभेंद प्रमाण वैवाहीक स्थिती, कुटुंब संस्था, यासारख्या घटक वा बाबींचा अंतर्भाव सर्वेक्षणात केला जातो.

२)    **सामाजिक पर्यावरण :**

लोक आणि मानव निर्मित वस्तू यांचा सामाजिक पर्यावरात समावेश झालेला असतो. समाज जीवनावर परिणाम करणारा हा एक महत्वपुर्ण घटक आहे. समाज जीवनात व्यक्ती मूर्त व अमूर्त अशा दोन्ही प्रकारच्या बाबींची निर्मिती करण्यात रस घेत असते.

३)    **सामाजिक क्रिया वर्तन :**

सामाजिक क्रियात लोकांच्या सवयीचा समावेश झालेला असतो. रेडिओ एकने, दूरदर्शनवरुन कार्यक्रम पाहणे, वर्तमानपत्रे वाचणे, यात्र सहल,खेळ सन उत्सव , भोजन, विविह प्रसंग या नी अशा अनेक क्रिया प्रकारांचा अभ्यास सर्वेक्षणाव्दारे केला जात असतो

४)    **मते व अभिवृत्ती :**

सर्वेक्षणाव्दारे एखाद्या वर्तमान पत्रासंबंधी वाचकांची मते जसी आजमावली जावू शकतात तसेच राष्ट्रीय पातळीवरून होणाऱ्या एखाद्या भ्रष्टाचारासंबंधी लोकांचे मत आहे हे सुध्दा अजमावले जाते. समाजात विविध समूह असतात. त्या प्रत्येक समूहाची मते व अभिवृत्ती एखाद्या प्रश्नासंबंधी  कशी आहेत हे जाणून घेण्यासाठी सर्वेक्षणाचा उपयोग केला जातो.

### सर्वेक्षणाचा उद्देश :

सर्वेक्षणाची सामग्री तथा अभ्यास याला जशी मर्यादा नाही तसेच उदेशाला सुध्दा मर्यादा नाही. सर्वसाधारणपणे विचार केल्यास असे लक्षात येते की, ज्ञानर्जन करणे समस्यांचे निराकरण करणे नी तव्दतच समाजकल्याणाच्या योजना आखणे नी त्यादृष्टीने विविध अंगाचे तथ्ये सकंलन करणे हे सर्वेक्षणाचे प्रमुख उद्देश समजले जातात.

१)    **तथ्य संकलन :**

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सर्वेक्षण पध्दतला वैज्ञानीक आधार असल्यामुळे समाजतील प्रत्येक घडामोडीचा नी वस्तुनिस्थितीचा तपशील तथ्याव्दारे संकलित केला जातो. सर्वेक्षणात अनेक आकडेवारीचेही संकलन केले जाते.  तथ्ये संकलन करणे हा एक महत्वपूर्ण उद्देश सर्वेक्षणाचा असतो.

२)      समस्या अध्ययन :

समाजात अनेकविध समस्या निर्माण झालेल्या असतात. या समस्यामुळे जनजीवन विस्कळीत बनते. विविध घटक, संस्था नी समुहावर या समस्याचा परिणाम होत असतो. गुन्हेगारी , दारिद्रय, घटस्फोट, हुंडा, पध्दत, वेश्यावृत्ती, जातीजातील संघर्ष, धर्म संघर्ष यानी अनेक प्रकारच्या समस्यामुळे संपूर्ण समाज जीवन विस्कळीत बनत असते. तेव्हा त्या समस्यांची कारणे, त्यापासून होणारे परिणमा नी त्यावर उपाय शोधून काढण्यासाठी सर्वेक्षण केले जाते. यात लोकांची भावना लक्षात घेऊन त्यादृष्टीने नियोजन करण्याचे काम केले जाते.

३)      कार्यकारण भावाचा शोध :

सामाजिक घटनांचा अभ्यास करण्यासाठी सर्वेणि पध्दतीचा वापर करून घेतला जातो. परंतु घटना वा समस्यांच्या  मुळाशी असणाऱ्या विविध करनांचा नी त्यांच्या परस्पर संबंध परंपरेचा शोध घेण्याचे काम सर्वेक्षणाव्दारे केले जाते.

४)      सिध्दतांचे पुर्नपरिक्षण :

प्रस्थापित सामाजिक सिध्दांत बरोबर आहे किंवा नाही यांचे पुर्नपरिक्षण करण्याचा प्रमुख उद्देश सर्वेक्षणाचा असतो.

५)      गृहीत कृत्य निर्मिती आणि परिक्षा :

सर्वेक्षणामुळे विविध प्रकारच्या सामाजिक बाजुसंबंधीचे तथ्ये संकलन केले जाते. परंतु तथ्ये संकलन करण्यापुर्वी पूर्व सर्वेक्षण हे गृहीतकृत्य निर्माण करण्यासाठी खुपच उपयुक्त ठरते. पूर्व सर्वेक्षणाचा अर्थ एखाद्या समुह वा गटाची एखाद्या विषयासंबंधी सर्वसामान्य माहिती मिळविणे असा होतो. ही अशा प्रकारची माहिती गृहीत कृत्य तयार करण्यासाठी अथवा सुचविण्यासाठी फलदायी ठरते.

६)      उपाययोजना :

सामाजिक समस्या निर्माण झाल्यानंतर  समाज व्यवस्था डळमळीत बनत असते. ह्या समस्या का निर्माण होतात नी त्यावर कोणत्या प्रकारचे उपाय योजिले म्हणजे त्यांचे प्रमाण कमी होईल हे सर्वेक्षणामुळे सहज लक्षात येण्यास मदत होत असते. सर्वेक्षणात एखाद्या समस्या वा विषयाची  निवड करून तथ्ये शोधली जातात.

सर्वेक्षण पध्दतीचे नियोजन :

एखाद्या विषयाचा अभ्यास करण्याचे निश्चित झाले असेल नी त्यासाठी सर्वेक्षण पध्दतीची निवड केली असेल तर संशोधक वा संस्थेला नियोजनाची गरज असते. त्यासाठी कार्यक्रमाची रूपरेषा, अभ्यासविषयाचे क्षेत्र, संशोधन तथा अध्ययनाचा उद्देश , सर्वेक्षणासाठी लागणारा कालावधी, खर्च नी मनुष्यबळ इत्यादी संबंधी विचार करावा लागतो.

●      समस्या सुत्रण

●      उद्दिष्टये

●      नमुना निवड

●      तथ्य संकलन

●      माहितीची पार्श्वभूमी

श्रम धन व कालावधी :

सर्वेक्षणाचे निश्चित नियोजन केले तर योग्य पध्दतीने तथ्य संकलित केले जातात नी त्यातून निघालेले निष्कर्ष अधिकाधिक बिनचुक असतात.

सर्वेक्षण पध्दतीचे प्रकार :

सर्वेक्षण पध्दतीव्दारे तथ्ये संकलन करून निष्कर्ष काढले जात असेल तरी तथ्य संकलन करण्यासाठी एकच पध्दत उपयोगात आणली जात नाही. विषयाचे स्वरूप नी महत्व लक्षात घेवून सामाजिक सर्वेक्षण कसे नी कोणत्या पध्दतीने केले जाईल या दृष्टीने वेगवेगळ्या प्रकारे विचार केला जातो.

- सर्वसामान्य सर्वेक्षण
- विशिष्ट सर्वेक्षण
- नियमित सर्वेक्षण
- नैमित्तिक सर्वेक्षण
- प्रारंभिक सर्वेक्षण
- अंतिम सर्वेक्षण
- वैश्विक सर्वेक्षण
- नमुना सर्वेक्षण

## सर्वेक्षण पध्दतीचे मूल्यमापन :

वर्तमान परिस्थितीत सामाजिक सर्वेक्षणाचा वापर मोठ्या प्रमाणात केला जावू लागला आहे. शासकीय तसेच संस्थात्मक पातळीवरुन जसा सर्वेक्षणाचा उपयोग करून घेतला जातो

- गुण व फायदे
- सखोल आकलन
- योग्य निदान
- समस्या निराकरण
- विश्वासनीयता
- वस्तुनिष्ठता

## नवीन माहिती :

सर्वेक्षणामुळे नवीन माहिती मिळत असते. कारण विषयाचे स्वरूप व्यापक असल्यामुळे प्रश्नांची मालिका खुप मोठी बनते. तसेच नवीन ज्ञान नी नवीन सिध्दांत निर्माण करण्यासाठी सुध्दा फायदेशीर ठरते.

## परिवर्तनाची दिशा :

सर्वेक्षणामुळे परिवर्तनाची दिश समजण्यास मदत होत असते. कोणताही समाज कधीही स्थिर नसतो. त्यात अनेक बदल घडून येत असतात. तथ्य संकलन पध्दतीपेक्षा सर्वेक्षण पध्दत उपयुक्त समजली जाते.

## संदर्भ –

१) भांडारकर पु.ल. (१९८३),‘‘सामाजिक संशोधन पध्दती’, विद्यापीठ ग्रंथनिर्मिती मंडळ नागपुर.

२) भितांडे वि.रा.(१९९४) ‘शैक्षणिक संशोधन पध्दती ’ नूतन प्रकाशन पूणे.

३) घाटोळे रा.ना. (१९९८),‘‘समाज शास्त्रीय संशोधन तत्वे व पध्दती,’’ श्री. मंगेश प्रकाशन , नागपुर.

# मराठी साहित्य संशोधन: दिशा व आव्हाने

## डॉ. मंदा माणिकराव नांदुरकर

मराठी विभाग प्रमुख मातोश्री विमलाबाई देशमुख महाविद्यालय , अमरावती

बीज शब्द... मराठी साहित्य, संशोधन, आव्हाने, दिशा

### शोधनिबंधाचा सारांश

कोणत्याही प्रकारच्या ज्ञानाच्या क्षेत्रातील संशोधनाचे महत्त्व अनन्य साधारण आढळते. संशोधन हा मानवी जीवनाचा मूलाधार आहे. आजचे युगे तंत्रज्ञानाचे आहे तंत्रज्ञान प्रगत झालेला आहे ते केवळ मानवाने लावलेल्या शोधामुळेच. शोध अतिशय महत्त्वाचा आहे. शोधामुळे विश्वातील विविध रहस्यांचा तंत्रज्ञानाचा उलगडा झालेला आढळून येतो. भाषा साहित्य समाजविज्ञान अशा विविध क्षेत्रातील विकास हा मानवी जीवनाला उपजतच निसर्गाने दिलेल्या व प्रत्येकाला अस्वस्थ करणाऱ्या असे का? या प्रश्नातच दिसून येते त्यामुळे प्रश्न व शोध या दोन्ही बाबी गतिमान होत गेल्या आणि त्यातूनच मानवी जीवनाची संस्कृती विकसित होत गेली संशोधनाच्या बाबतीत नाविन्याचा ध्यास नवीन काहीतरी मांडणी करणे ही मानवाची नैसर्गिक प्रवृत्ती आहे त्यातूनच संशोधनाचा विकास होत गेलेला आढळते. मराठी भाषा व साहित्य संशोधन परंपरेचा विचार केल्यास अतिशय समृद्ध आणि संपन्न अशी संशोधन परंपरा मराठीला लाभलेली आहे .

मराठी भाषा व साहित्य यांच्या वांड्.मयीन अंगाने सामाजिक सांस्कृतिक ऐतिहासिक उच्च दर्जाचे संशोधन करणाऱ्या विद्वानांची एक मोठी परंपरा मराठीला लाभलेली आढळते. आधुनिकीकरणाच्या बदलणाऱ्या या युगात मराठी साहित्य व भाषेच्या संदर्भात नव्या संशोधनाच्या दिशेचा शोध आपल्याला घेता येतो. मराठी भाषेच्या संदर्भात विचार केल्यास या भाषेचा लोकजीवनाशी अतूट असा संबंध आहे तिला समृद्ध अशी परंपरा आहे तिला सुबोध अशी लिपी आहे आणि सर्वात महत्त्वाचे म्हणजे तिला साहित्याचा समृद्ध असा वारसा आहे .

साहित्यिक संशोधन ही साहित्याच्या भागाशी संबंधित माहिती शोधण्याची प्रक्रिया आहे.

### प्रस्तावना

संशोधन म्हणजे नवीन काहीतरी शोधणे साहित्य कृतीमध्ये काहीतरी नवीन शोधणे . संशोधनामध्ये प्रत्येक प्रकाराचा स्वतःचा दृष्टिकोन आणि उद्दिष्ट असतात. संशोधन साहित्य ही अशी सामग्री आहे जी एखाद्याला त्यांचा विषय समजून घेण्यास आणि युक्तिवाद किंवा स्पष्टीकरण तयार करण्यास मदत करते संशोधन साहित्य शोधण्यास मदत करण्यासाठी काही मूलभूत टिपा आहेत ज्याला संदर्भ साहित्य जसे की विश्वकोश, शब्दकोश, लेखन कोश याशिवाय तंत्रज्ञानाच्या या युगामध्ये नवनवीन संकेतस्थळ उपलब्ध असलेले दिसून येतात.

संशोधन संसाधने आपल्या वैयक्तिक अनुभवातून येऊ शकतात. पुस्तके ,ब्रोशर ,जर्नल्स, मासिके, वर्तमानपत्र यासारखे प्रिंट मीडिया आणि संकेतस्थळ, इंटरनेटवर इलेक्ट्रॉनिक स्त्रोत सापडतात .आपण घेतलेल्या मुलाखती सर्वेक्षणांमधून देखील ही संसाधने उपलब्ध होऊ शकतात.संशोधना करता स्त्रोत सामग्री म्हणजे माहिती आणि कल्पना गोळा करण्याकरता लेखक वापरत असलेल्या वस्तूंचा संग्रह आहे स्त्रोत हे लिखित, बोललेले असू शकते तर पुस्तके जर्नल लेख छायाचित्रे अहवाल या सर्वांचा समावेश संशोधन स्त्रोत साहित्यामध्ये आढळून येतो. संबंधित साहित्याचे पुनरावलोकन हे प्रबंध किंवा प्रबंधाच्या विषयाशी संबंधित विद्यमान साहित्याचे तपशीलवार पुनरावलोकन आहे आपल्या विषयाशी संबंधित विद्यमान साहित्यातील ज्ञान आणि निष्कर्षांबद्दल शोध घेणे,हे महत्त्वाचे ठरते. संशोधनामध्ये एखाद्या विशिष्ट विषयावर आधी लिहिलेल्या साहित्याचा संदर्भ देण्यासाठी उपयोग करता येतो.

माहिती किंवा पुराव्याचे स्त्रोत अनेकदा प्राथमिक दुय्यम किंवा तृतीय सामग्री म्हणून वर्गीकृत केले जातात हे वर्गीकरण सामग्रीची मौलिकता आणि स्त्रोत किंवा उत्पत्तीच्या समीपतेवर आधारित असते.

संशोधन म्हणजे नवीन ज्ञानाची निर्मिती आणि ज्ञानाचा नवीन आणि सर्जनशील मार्गाने वापर करणे म्हणजे नवीन संकल्पना पद्धती आणि समज निर्माण करणे यामध्ये मागील संशोधनाचे संश्लेषण आणि विश्लेषणाचा समावेश असू शकतो ज्या प्रमाणात ते नवीन आणि सर्जनशील परिणामांना कारणीभूत ठरते.

उद्दिष्टे

नवीन ज्ञान ओळखणे

समस्यांचे निराकरण करणे.

निष्कर्षांचे पुरावे सादर करणे.

मिळवलेल्या माहितीचे विश्लेषण करणे.

संशोधनाची विषय निश्चिती पूर्व लेखनाचा आढावा संशोधन  हेतू निश्चिती, गृहीतके, माहितीचे संकलन व निष्कर्ष या संशोधनाच्या पायऱ्या आहेत.

मराठी साहित्य आणि भाषा संशोधनाच्या कक्षा आता दिवसेंदिवस रुंदावतांना दिसून येत आहे त्याचा अधिकाधिक विस्तार होत आहेत.

आधुनिक युगामध्ये ज्ञान विज्ञानाच्या विविध शाखांचा विकास अत्यंत जलदगतीने होत आहे बदलती परिस्थिती, वैचारिक दृष्टिकोन, अद्ययावत साधनसामग्री इत्यादी गोष्टींबरोबरच इतरांच्या संदर्भात स्वतःला जाणून घेण्याची मनुष्याची प्रबळ जिज्ञासा हा या संशोधनाचा महत्त्वाचा टप्पा मानावा लागेल. दैनंदिन जीवन क्रमामध्ये आपली आवड निवड मुख्यतः उपलब्ध अगरज्ञात विषयांच्या संदर्भातच असते.

वाङ्मयाचा अभ्यास करताना वाङ्मयाच्या इतिहासाची सुरुवात कालखंडाची मांडणी विभाजन तत्कालीन सामाजिक, आर्थिक, राजनैतिक, सांस्कृतिक परिस्थिती, तत्कालीन कृतीचे मूल्यमापन विशिष्ट विचारधारा तत्कालीन साहित्याची वैशिष्ट्ये इत्यादी अनेक गोष्टींमध्ये साम्य आणि वैशम्य त्याची कारण मी माणसा लक्षात घेणे गरजेचे ठरते वाङ्मयाच्या इतिहासाचा कालखंड हा बराच मोठा असल्यामुळे संपूर्ण कालखंडाच्या इतिहासाची तुलना करणे ऐवजी सीमित व विशिष्ट कालखंड लक्षात घेणे महत्त्वाचे ठरते. लोकसाहित्य, भाषाशैली व व्याकरण, काव्यशास्त्र नाटक, कादंबरी, एकांकिका, कथा ,निबंध, चरित्र, संस्मरण, दलित साहित्य, ग्रामीण साहित्य, स्त्रियांचे साहित्य, आदिवासी साहित्य, संत साहित्य, संस्कृती या सर्वांचा विचार करणे संशोधनात मराठी साहित्याच्या अंगाने महत्त्वपूर्ण ठरते.

संशोधनाचा विचार करत असताना संशोधनावरील निष्ठा, शिस्त, पद्धतशीरपणा, टापटीप, परिश्रम सिद्धता पूर्वग्रहांपासून अलिप्तता ,वस्तुनिष्ठता इत्यादी गुण महत्त्वपूर्ण ठरतात.

वांग्मय प्रकारांचा अभ्यास करताना आकृतीबंधाची मांडणी लक्षात घ्यायला हवी.

लोकसाहित्याच्या संदर्भात अन अक्षर ग्रामीण किंवा आदिम समाजाचे साहित्य म्हणजेच लोकसाहित्य असा दीर्घकाळ समज लोकसाहित्याच्या अभ्यासाकांचा होता तो आता बदलताना दिसत आहे सौंदर्य भावना नीती तत्वे तत्त्वज्ञान आणि भाषा या चार वैशिष्ट्यांनी युक्त अशा समूहाला लोकसाहित्याच्या संदर्भात लोक अशी संज्ञा असल्याचे लक्षात घेता येते त्यामुळे अशा वैशिष्ट्यांनी युक्त समूह नेहमीच अन अक्षर ग्रामीण व आदिवासी असेल असे नाही समाजात असे समूह नेहमीच असतात दर पिढीत तपशील बदलतात परंतु वरील वैशिष्ट्यांनी युक्त समूह असतातच आणि लोकसाहित्याची निर्मिती अशा प्रकारच्या सर्व समाज स्तरांवरून सातत्याने होत असते लोकसाहित्य निर्मितीची प्रक्रिया ही अखंड चालणारी आणि अखंड अभ्यासनीय अशीच आहे ,या दृष्टीने अधिक

प्रयत्न व्हायला हवेत. लावणी, पोवाडा, अभंग, डोहाळ जेवणाची गीते, पाळणे इत्यादी प्रकारच्या साहित्याचा समावेश यात करता येईल. श्रीमती दुर्गाबाई भागवत, डॉ

प्रभाकर मांडे हे जेष्ठ संशोधक अशा साहित्याला लौकिक वांग्मय अशी संज्ञा देतात. लोक साहित्य ही सामूहिक निर्मिती असते ती अनाम असते ही निर्मिती तो समूह ज्या भौगोलिक भाषिक सांस्कृतिक परंपरेतून आलेला असतो त्या सामूहिक कृतीचा परिसराचा सांस्कृतिक धोरणेचा मौखिक स्वरूपात झालेला अविष्कार असतो लोक साहित्य हा एक विशिष्ट सामूहिक जीवनाचा सामूहिक आविष्कार असतो हा अविष्कार दृश्य व श्राव्य स्वरूपात असतो या सामूहिक आविष्कारातून तो विशिष्ट समूह आपल्या सामूहिक संस्कृतीची जाणीव अभिव्यक्त करीत असतो. भारतीय व मराठीतील लोकसाहित्याला थोर परंपरा आहे लोकसाहित्याची विविध अंगांनी संपन्नता आहे या परंपरेचे जतन कसे का व कशा प्रकारे करावयाचे यांची उत्तरे देण्यासाठी आजच्या तंत्रज्ञानाच्या या युगात लोकसाहित्याचा शास्त्रशुद्ध पद्धतीने अभ्यास विविध तांत्रिक मार्गांनी व्हायला हवा.

संत साहित्याची प्रेरणा ही सामाजिक परिवर्तनाचा ध्यास ही राहिली आहे, त्यामुळे संत साहित्याचा समाजप्रबोधन व सांस्कृतिक स्वरूप या अंगाने केलेला अभ्यास व संशोधन अधिक मोलाचे ठरते.

मराठी साहित्यातील ग्रामीण साहित्य हा एक महत्त्वाचा प्रवाह मानला जातो. ग्रामीण साहित्याने मराठी साहित्यात संख्यात्मक व गुणात्मक दृष्ट्या अतिशय मोलाची भर घातलेली आहे. एक नवा आशय, जीवनाचे नवे क्षेत्र मराठी वाचकांसाठी ग्रामीण साहित्याने खुले करून दिले. या अर्थाने मराठी साहित्याला समृद्ध करण्याचे कार्य ग्रामीण साहित्याने केले आहे.

स्त्रीवादी जाणिवेचा विविध दृष्टिकोनातून, भिन्न भिन्न पातळयांवरचा आविष्कार स्त्रीवादी साहित्यात आढळून येतो.

स्त्रीकेंद्री साहित्याची निर्मिती अगदी प्राचीन काळापासून मौखिक वा लिखित स्वरूपात होत होती, असे दिसून येते. स्त्रियांच्या साहित्याचे मूळ प्राचीन काळापर्यंत जाऊन पोहोचते. स्त्री आपल्याशीच किंवा आपल्यासारख्याच दुसरीशी चालेलल्या संवादातून'बाई असण्याचा ', ' बाईपणाचा ' अर्थ व्यक्त करीत आली आहे. मराठी लोकगीतां त हा स्त्रीत्वाचा स्वर सतत ऐकू येतो. अन्याय, बंधने, शिक्षा, दंड, तक्रार, शोषण, पुरुषांकडून मिळणारी अन्यायकारक व अपमानास्पद वागणूक, सततची अवहेलना व उपेक्षा, अपाय, इजा, आपल्याकडून चूक वा अपराध घडेल का ह्याची स्त्रीला वाटणारी धास्ती इ. स्त्रियांच्या अनु-भवविश्वाच्या कक्षेतील अशा अनेक भावना आणि तथ्ये त्यांनी लोकवाङ्मयातून शब्दांकित केलेली दिसतात.

संशोधनाच्या कक्षा विस्तारत असताना आपणही नवनवीन विषयांचा शोध घेतला पाहिजे. काही जुने विषय नव्या परिप्रेक्ष्यातून अभ्यासले पाहिजेत. नव्या संकल्पना निर्माण करून संशोधन व्हावयास हवे. समाज, संस्कृती, इतिहास आणि साहित्य यांचा अनुबंध पक्का असतो, हे संशोधकाने लक्षात घ्यावयास हवे. त्यामुळे साहित्याच्या अभ्यासकाने या बाबींकडे कानाडोळा करता कामा नये. हळूहळू आंतरविद्याशाखीय संशोधनाकडे आपण वळावयास हवे; तरच संशोधन एकसंध होईल.नव्या पिढीत संशोधनाला आवश्यक गुण चिकित्सकपणा तो दिसून येतो. अद्ययावत तंत्रज्ञानामुळे तंत्रज्ञानाची मदत घेऊन सहज व सुलभता निर्माण झालेली दिसून येते. संशोधकांमध्ये ज्ञानपीपाचा, संशोधनाची आवड व चिकाटी या गुणांचे सहचार्य मिळाल्यास उत्कृष्ट संशोधन निर्माण होणे शक्य होईल. पूर्वग्रहाधिष्ठित मते व अहंकार ही संशोधनाला मारक ठरतात. ज्ञानाचे क्षेत्र विस्तीर्ण आहे. एकेक विषयाचे संशोधन करण्यासाठी खूप कालावधी लागतो .संशोधन ही वर्षानुवर्षांची साधना आहे.संशोधनात आत्मसमर्पण वृत्ती आवश्यक ठरते. व्यवहारातील फायदे ,तोटे विचारात घेऊन खरे संशोधन होत नाही कुठल्याही संशोधनात एक प्रकारचा उन्न आनंद असतो, त्यासाठी हवे ते कष्ट करण्याची तयारी करावी लागते.

संशोधनात थोड्या आधारांवर तर्काचे मोठे निष्कर्ष काढणे संयुक्तिक ठरत नाही. प्रांजळपणाने व समतोल मनाने सर्व आधार शोधून ते दाखल करून निर्णय घेणे ही संशोधनाची स्वाभाविक प्रक्रिया आहे. एकूणच मराठी संशोधनाची सद्यस्थिती व दिशा निश्चितच चांगली आहे.

अपेक्षा

संशोधनाचा विचार करता संशोधने मौलिक असावे.

विषय निवडताना मूल्य असलेला विषय निवडावा.

एखादा कालखंड, परिसर ,समूह असा विषयांमध्ये समावेश असावा .

संशोधनातून वांग्मय निर्मिती आस्वाद मूल्यमापन समीक्षा यांना वाव मिळण्यात यावा.

संशोधनातून सांस्कृतिक संवर्धन व्हावं

संशोधनामध्ये भाषिक वाड्.मयीन सामाजिक  उपयुक्तता असावी.

ग्रामीण दलित आदिवासी भटके विमुक्त तृतीयपंथी यांच्यावरील साहित्यावर संशोधन होण्याकरता विषय निवडण्यात यावे.

संशोधनातून निष्कर्ष यायला हवेत.

निष्कर्ष

संशोधनाची भूमिका मौलिक आढळते.

मराठी साहित्य व संशोधनातून वांग्मय निर्मिती, आस्वाद, मूल्यमापन समीक्षा यांना बळकटी मिळते.

संशोधन ही सातत्याने चालणारी प्रक्रिया आढळते.

संशोधन हे समाज जीवनासाठी वांग्मय निर्मितीसाठी व वांग्मय व्यवहारासाठी उपयुक्त ठरते.

 संदर्भ :

भाषा व साहित्य: संशोधन, संपादक डॉ. वसंत जोशी, डॉ गं.ना. जोगळेकर ,महाराष्ट्र साहित्य परिषद पुणे

सं.गं .मालशे, साहित्याभ्यासाची शैलीलक्षी पद्धत ,मराठी संशोधन मंडळ, मुंबई

मराठी संकेतस्थळ

## संशोधन आराखडा व कार्यकरणवाद

### सिम्रेला आर देशमुख

संशोधक मातोश्री विमलाबाई देशमुख महाविद्यालय ,अमरावती

प्रस्तावना

संशोधन आराखडा

संशोधन आराखडा हा, संशोधन प्रवासातील संशोधन समस्यांची वैध, वस्तुनिष्ठ, बिनचूक उत्तरे मिळण्यासाठी आणि आर्थिकदृष्ट्या परवडण्यासाठी तुम्ही निवडलेला एक पथदर्शक नकाशा आहे. संशोधन प्रक्रियेत कशा आणि कोणत्या पद्धती आणि रीती वापरायच्या याचा रीती आणि कृती याची यादी आहे

कर्लिंगर यांच्या मते

संशोधन आराखडा हा, संशोधन प्रश्न किंवा समस्या यांची उत्तरे प्राप्त करण्यासाठी अन्वेषणाचा संरचित आणि रणनीती दर्शवणारा नकाशा आहे. हा नकाशा संशोधनाचा पूर्ण कार्यक्रम किंवा योजना आहे. यामध्ये अन्वेषक, गृहीतकृत्य लेखनापासून ते तथ्यांचे अंतिम विश्लेषण यापर्यंत होणाऱ्या कार्यान्वयन विहितार्थ यांचा समावेश होतो.

"सेल्टीझ"

यांच्या मते

संशोधन आराखडा ही तथ्य संकलन आणि विश्लेषण यांची अशी रचना आहे ज्याचा त्याचा उद्देश संशोधन हेतूची व्यावहारिक सांगड घालणे आणि कार्यपद्धती अल्प खर्चात पार पाडणे उद्देश असतो

संशोधन आराखडा हा, ज्याद्वारे संशोधक कोणता अभ्यास आराखडा वापरणार आहे हे त्यांनी स्वतः ठरवणार आहात व इतरांना सांगणार आहात, इतर प्रतिसादकांकडून माहिती कशी संकलित करणार आहात, प्रतिसादकांची निवड कशी करणार आहात, संकलित केलेल्या माहितीचे विश्लेषण कसे करणार आहात आणि त्यांची अनुमाने कशी संप्रेषित करणार आहात, याची योजना आहे. याशिवाय संशोधन प्रवासात 'कसे' याचे प्रत्येक निर्णयासाठी तर्कशुद्ध आणि स्पष्टीकरणात्मक तपशील द्या. तर्कशुद्ध उत्तरे आणि स्पष्टीकरण सादर करताना साहित्याच्या परीक्षणाचा आधार घ्यावा लागेल. संशोधकांनी ठरवलेला मार्ग हा वैध आणि विश्वसनीय निष्कर्ष देईल याची संशोधकाला स्वतःला व इतरांना खात्री द्यावी लागेल.

संशोधन आराखड्याची कार्ये

संशोधन आराखड्याची दोन मुख्य कार्ये सूचित करण्यात आली आहेत.

१) संशोधन अभ्यास हाती घेताना पहिले कार्य, आवश्यक कार्यपद्धतीचा शोध आणि विकास, त्याची आखणी याच्याशी संबंधित असते .

२) दुसरे या कार्यपद्धतीत वैधता, वस्तुनिष्ठता आणि अचूकता आणून गुणवतेची हमी देण्यावर भर असतो.

* तुमचा अभ्यास पूर्ण होण्यासाठी विविध रीती आणि कामे पूर्ण करावी लागतात यासाठी प्रत्यक्ष कृती करण्याजोग्या रूपरेषेचे संकल्पनात्मक चित्र उभे करावे

* संशोधन समस्येची वैध, वस्तुनिष्ठ आणि अचूक उत्तरे प्राप्त करण्यासाठी या पद्धती पुरेशा आहेत का याची खात्री करा. "कर्लिंगर" या कृतीस बदलावरील नियंत्रण असे संबोधतात.

संशोधन आराखड्यातील आवश्यक बाबी

* तुमचा अभ्यासाधीन लोकसमुदाय कोण असणार आहे?

* अभ्यासाधीन लोकसमुदाय कशाप्रकारे वेगळा करणार आहात ?

* नमुना निवड करणार आहात की संपूर्ण लोकसमुदाय निवडणार आहात ?

* जर नमुना निवड केली तर त्यांच्याशी संपर्क कसा साधणार आहात ?

* त्यांची संमती कशी मिळवणार आहात ?

* तथ्य संकलनासाठी कोणती पद्धत वापरणार आणि का?

* जर प्रश्नावली वापरली असेल तर प्रतिसादकांनी ती कुठे आणून द्यायची आहे?

* प्रतिसादकांना जर शंका असतील तर त्यांनी कुठे संपर्क करायचा आहे?

* मुलाखती घेणार असाल तर त्या कुठे घेणार?

* नैतिक मुद्द्यांबाबतची खबरदारी कशी घेणार?

या सर्व बाबींचा विचार करावा लागेल

कार्यकारणवाद आणि संशोधन आराखडा

संशोधन आराखड्याचे दुसरे कार्य म्हणजे संशोधन समस्येची अचूक, वैध आणि वस्तुनिष्ठ उत्तरे मिळवण्यासाठी ठरवलेल्या पद्धती पुरेशा योग्य आहेत याची खात्री करा. सामाजिकशास्त्रांत, ज्यांच्यावर आपले नियंत्रण नाही असे अनेक घटक उलगडत जातात जे घटना बदलण्यास कारणीभूत ठरतात. हे घटक घटनेवर अनेक मार्गांनी परिणाम करू शकतात. तरीही, बहुतेक अभ्यासांमध्ये आपण एकाच कारणांचा (स्वतंत्र चल) अभ्यास करतो आणि प्रसंगी दोन कारणांचा आपण जसजशी अधिक स्वतंत्र चले समाविष्ट करत जाल तसतसा आराखडाही अधिकाधिक जटिल होत जाईल, तो करायला कठीण व खर्चिकही होईल. या सर्व चलांचा दुवा जरी परावलंबी चलाशी जोडला असला तरीही ते तुमच्या अभ्यासाच्या केंद्रस्थानी नसतात, त्यांना भिन्न चल असे म्हटले जाते. कार्यकारण सिद्धान्त तुम्हाला परावलंबी चलामध्ये बदल घडवून आणण्यास कारण ठरणारी वेगवेगळी चले समजून घेण्यासाठी मदत करतो. हा सिद्धान्त तुम्हाला चलांच्या वेगवेगळ्या वर्गीकरणाचा निश्चित व अलग प्रभाव दाखविण्यासाठी मदत करतो, त्यामुळे तुम्ही स्वतंत्र चलांची वैधता, वस्तुनिष्ठपणे व अचूकपणे शोधून काढू शकता.

संशोधन साधनातील संदिग्धता किंवा प्रतिसादाची मनोवस्था यामुळे अवलंबी चलांमध्ये होणाऱ्या बदलाला यादृच्छिक चल किंवा संभाव्य चल असे म्हणतात. त्यामुळे होणाऱ्या चुकीला यादृच्छिक किंवा संभाव्य त्रुटी असे म्हणतात. अनेक उदाहरणांमध्ये संभाव्य चलांचा प्रभाव हा नगण्य असतो, कारण प्रतिसादकांनी अत्यल्प प्रतिसाद नोंदवले आहेत ते विचारात घेऊन ज्यांनी जास्त प्रमाणात प्रतिसाद नोंदवले आहेत ते रद्द करण्याकडे कल असतो. तशाच प्रकारे संशोधन साधनातील संदिग्ध प्रश्नांनाही हे तत्त्व लागू होते.

म्हणून कोणत्याही कार्यकारण संबंधांत अवलंबी चलातील परिणामांमुळे तीन प्रकारचे चल घडून येतात.

अवलंबी चलातील बदल

१)स्वतंत्र चलात बदल घडून येण्याची शक्यता

२)भिन्न चलात बदल घडून येण्याची शक्यता

३)यादृच्छिक किंवा संभाव्यता चलात बदल घडून येण्याची शक्यता

संदर्भ

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## संशोधन : अर्थ, व्याख्या, उद्दिष्ट्ये,वैशिष्ट्येव महत्व.

### श्री. प्रशांत जगतराम शेंदूरकर

एम. ए. मराठी. बी. एड

**प्रास्ताविक :-**

मानवी जीवनात संशोधनाला खूप महत्व आहे. संशोधनातून ज्ञानात भर पडते, सोबतच नवीन संकल्पना व तथ्ये शोधली जातात. आजच्या आधुनिक युगातसुद्धा मानवासमोर अनेक समस्या आहेत, तसेच दररोज अनेक नव्या समस्यासुद्धा निर्माण होत असतात. अशा समस्यांचे निराकरण करण्यासाठी व त्यावर उपाय शोधण्यासाठी संशोधन हे महत्वाची भूमिका पार पाडते. मानवजातीचे कल्याण करण्याची क्षमता संशोधनात आहे, त्यासाठी आजच्या शिक्षण पद्धतीत संशोधनासाठी पूरक वातावरण निर्माण करणे गरजेचे आहे.

संशोधन ही सातत्याने चालणारी प्रकिया आहे. एखादी समस्या किंवा प्रश्न सोडवण्यासाठी संशोधक संशोधनाची प्रकिया हाती घेत असतो. नंतर ती समस्या सोडवण्यासाठी संशोधकाला संशोधन विधान तयार करणे, त्यास अनुसरून उद्दिष्ट्ये निश्चित करणे, गृहितके मांडणे, माहिती गोळा करून त्याचे संकलन करणे, माहितीचे वस्तूनिष्ठ पद्धतीने विश्लेषण करणे, व त्या समस्येवरील उपाय सुचविणे अशा प्रक्रियेतून जावे लागते.

प्रस्तुत शोधनिबंधात संशोधनाचा अर्थ, व्याख्या, संशोधनाचे महत्व, संशोधनाची वैशिष्ट्ये, संशोधनाचीउद्दिष्ट्ये याचा अभ्यास करण्यात आला आहे.

**प्रस्तुत शोधनिबंधाची उद्दिष्ट्ये :-**

- ➢ प्रस्तुत शोधनिबंधात संशोधनाचा अर्थ, उद्दिष्ट्ये, इ. चा अभ्यास केला आहे.
- ➢ संशोधनाचे महत्व काय आहे याचा अभ्यास प्रस्तुत शोधनिबंधातकेला आहे.
- ➢ संशोधन प्रक्रियेचीवैशिष्ट्ये स्पष्ट करण्यात आले आहे.

**संशोधनाचा अर्थ व व्याख्या :-**

'संशोधन' या मराठी शब्दाचा विचार केला असताया शब्दाची **सं+शोधन** अशी आपल्याला फोड करता येईल. याचा अर्थ शोध घेणे, चौकशी करणे, काळजीपूर्वक तपास करून सत्यशोधनाचा शास्त्रीय प्रयत्न करणे असा होतो.

संशोधन हा शब्द इंग्रजीतील **Research** या शब्दासाठी प्रतिशब्द म्हणून वापरतात. **Re** म्हणजे पुन्हा व **Search** म्हणजे शोध घेणे होय. यावरून पुन्हा पुन्हा एखाद्या बाबीचा शोध घेणे अथवा तपास करण्यास संशोधन म्हणतात. नवीन सत्य आणि नवीन वस्तूस्थिती अभ्यासणे म्हणजे संशोधन होय.

**संशोधनाच्या व्याख्या :-**

- ➢ वेब्स्टरच्या शब्दकोशाप्रमाणे " संशोधन म्हणजे तथ्ये किंवा तत्वे शोधण्यासाठी करण्यात येणारी चिकित्सा किंवा परीक्षण, किंवा एखादी गोष्ट शोधून काढण्यासाठी सतत व पद्धतशीरपणे केलेले परिश्रम होय."
- ➢ स्मॉल यांच्या म्हणण्याप्रमाणे संशोधनाचा अत्यंत साधा अर्थ म्हणजे गोष्टी (Things) शोधूनकाढण्याचा प्रयत्न करणे होय.
- ➢ जे. डब्लू बेस्ट यांच्या मते " संशोधन ही एक व्यवस्थित प्रक्रिया आहे, ज्याद्वारे शोध घेतला जाते आणि संघटित ज्ञानाच्या अंगांचा विकास केला जातो."

➤ न्यू सेंच्युरी शब्दकोशाप्रमाणे " संशोधन म्हणजे एखाद्या विषयाचा सातत्यपूर्ण काळजीपूर्वक पद्धतशीरपणे अभ्यास करणे होय." अशा अभ्यासाचे उद्दिष्ट नेहमी नवीन माहिती गोळा करणे किंवा नविन तत्त्वे शोधून काढणे हे असते.

➤ रेडमन व मोरी यांच्या मते " संशोधन म्हणजे नवीन ज्ञान मिळवण्यासाठी घेतलेले पद्धतशीर प्रयत्न होय."

## संशोधनाचीउद्दिष्ट्ये :-

शास्त्रीय पद्धतीने एखाद्या समस्येच्या उत्तराचा शेध घेणे हा संशोधनाचा हेतू असतो. आजपर्यंत ज्या गोष्टींचा शोध लागलेला नाही आणि जी गोष्ट शोधणे कठीण आहे, त्यामागील सत्याचा शोध घेण हे संशोधनाचे प्रमुख उद्दिष्ट आहे. संशोधनाची काही उद्दिष्ट्ये खालीलप्रमाणे.

➤ नवीन ज्ञान मिळवणे.

➤ अस्तित्वात असणारे सिद्धांत व तथ्ये यांची पडताळणी करणे व चाचणी करणे.

➤ नवीन शोध  शोध लावणे.

➤ समस्यांशी निगडीत कारणांचा शोध घेऊन अभ्यास करणे.

➤ सत्याचा शोध घेणे.

➤ संशोधनासाठी निवडलेल्या विषयासंबंधिची माहिती संकलित करणे, त्यातील घटना, कारणे, परिणाम यांचे पृथ:करण करणे.

➤ घडणाऱ्या घटनांची कारणमिमांसा करणे व मानवी व्यवहारासंबंधी सार्वत्रिक सिद्धांत मांडणे.

➤ संशोधित ज्ञानाचा व्यावहारिक उपयोग दाखवून देणे.

## संशोधनाची वैशिष्ट्ये :-

➤ संशोधनाची सुरूवात समस्येतून होते.

➤ संशोधनात समस्या निश्चितीची गरज असते.

➤ संशोधनात नियोजनाची आवश्यकता असते.

➤ संशोधनात मुख्य समस्या ही उपसमस्येच्या स्वरूपात मांडणे आवश्यक असते.

➤ संशोधनात समस्येचे उत्तर म्हणून गृहितकृत्यांची योजना असते.

➤ संशोधनातून वस्तुस्थितीचे अर्थनिर्वचन केले जाते.

➤ संशोधन चक्रीय असते.

## संशोधनाचे महत्व :-

कोणत्याही क्षेत्राचा विकास हा संशोधनामुळे होत असतो. अनेक प्रकारच्या संशोधनातून विविध प्रकारचे ज्ञान उदयास येते. त्याचा उपयोग मानवी कल्याणासाठी केला जातो. त्यामुळेच संशोधनाचे महत्व जाणून घेणे गरजेचे आहे.

➤ संशोधनातून वैज्ञानिक व तर्कशुद्ध ज्ञानाची प्राप्ती होते.

➤ वैज्ञानिक दृष्टिकोन निर्मितीसाठी संशोधन महत्वाचे आहे.

➤ संशोधनामुळे अज्ञानाचा नाश होतो.

➤ संशोधन हे शासकीय धोरणांना आधार पुरविते.

➤ संशोधनातून विविध समस्यांची उकल होते.

➤ संशोधन हे सामाजिक आणि राष्ट्रीय विकासास मदत करते.

➤ सामाजिक कल्याणासाठी संशोधन हे उपयुक्त ठरते.

➤ संशोधनामुळे नवीन तथ्यांचा शोध घेतला जातो.

➢ समस्यांच्या निराकरणासाठी संशोधन महत्वाचे असते.

➢ समाजातील समस्या सोडवून सामाजिक नियोजन करण्यासाठी संशोधन महत्वाचे असते.

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➢ कऱ्हाडे बी. एम. 'शास्त्रीय संशोधन पद्धती' पिंपळापुरे प्रकाशन , नागपूर.

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