Module 3 –
Interpretation and Report Writing
&
Intellectual Property (IP) Acts:

Module – III

Interpretation and Report Writing- Meaning of Interpretation, Techniques of Interpretation, Precautions in Interpretation, Significance of Report writing, Different steps in writing report, Layout of the research report, Types of reports, Oral presentation, Mechanics of writing a research report, Precautions for writing research reports.

Technical Writing and Publishing - Free Writing and Mining for Ideas, Attributes and Reasons of Technical Writing, Patent or Technical Paper, The Choice, Writing Strategies, Journal Paper: Structure and Approach, Language Skills, Writing Style, and Editing, Rules of Mathematical Writing, Publish Articles to Get Cited.

Interpretation and Report Writing

- Meaning of Interpretation,
- Technique of Interpretation,
- Precaution in Interpretation,
- Significance of Report Writing,
- Different Steps in Writing Report,
- Layout of Report.
- Types of Reports,
- Oral Presentation,
- Mechanics of Writing a Research Report,
- Precautions for Writing Research Reports.

MEANING OF INTERPRETATION

•**Interpretation** means drawing conclusions or making sense of the facts after analyzing or experimenting.
•It's about looking for a **broader meaning** in the research findings.
•The task of interpretation has two main parts:

1.a)Linking Results: **The effort to establish continuity in research** through linking the results of a given study with those of another result.

b)Creating Explanations: Developing concepts or ideas to explain the results.

2.Relationships in Data: Interpretation is concerned with relationships within the collected data, partially overlapping analysis.

A researcher can gain a better understanding of the basic ideas or principles behind their findings. They can also connect their findings to other studies in the field.

Appreciating significance through interpretation: This interpretation helps the researcher to understand their findings and explain the importance of their results to others.

Interpretation leading to new hypotheses: In exploratory research (which is often about discovering new ideas or patterns), interpreting the findings can lead to new questions or hypotheses.
These hypotheses can then be tested in experimental research.

TECHNIQUE OF INTERPRETATION

- **Explain findings clearly**: A researcher should give clear and reasonable explanations for the relationships they have discovered in the study.

- **Extraneous information**: Any additional information gathered during the research should be considered when interpreting the final results.

- **Consult others before final interpretation**: Before making a final conclusion, it's a good idea to talk to someone who understands the study well, and who can point out any mistakes or missing parts in your thinking.

- **Consider all factors**: Researchers should only interpret their results after carefully considering all the factors that could influence the study, to avoid making incorrect generalizations.

- **Understand why findings are what they are**: Proper interpretation helps explain why the research results turned out the way they did.

- **Exploratory research leads to hypotheses**: The interpretation of exploratory research findings can lead to new hypotheses. This helps move from an exploratory phase to an experimental phase of research.

PRECAUTIONS IN INTERPRETATION

Researcher must pay attention to the following points for correct interpretation:

•**Ensure Data Quality**:
•Verify that the data is appropriate, trustworthy, and sufficient for drawing conclusions.
•Ensure the data shows good consistency (homogeneity).
•Confirm that proper statistical methods have been applied to analyze the data.

•**Be Aware of Possible Errors**:
•Stay cautious about errors that could arise from misinterpreting statistical measures.

•**Interpretation and Analysis are Linked**:
•Interpretation should not be seen as separate from analysis. Both are closely connected and must be considered together.

•**Look Beyond the Obvious**:
•Interpretation involves not just observing visible trends but also identifying hidden factors that may influence the results.

•**Ongoing Interaction Between Hypothesis, Observation, and Theory**:
•Ideally, research should involve continuous interaction between the initial hypothesis, the empirical data, and theoretical ideas throughout the study.

SIGNIFICANCE OF REPORT WRITING

Sharing Knowledge

A research report helps share what you've discovered with others. It allows other people—researchers, students, or professionals—to learn from your findings and build on your work.

2. Organizing Findings

Writing a report helps you organize your research clearly. It forces you to explain what you did, how you did it, and what you found in a logical way, which makes it easier to understand.

3. Clear Communication

A well-written research report makes complex ideas easier to explain and communicate. This helps others understand your work, even if they're not experts in your field.

4. Proving Credibility

When you write a research report, it shows that you've done your work carefully and thoughtfully. A good report builds your reputation as a serious researcher.

5. Review and Improvement

A research report lets others check and critique your work. This peer review helps ensure your findings are valid and accurate, and it allows others to repeat your study if they want to.

6. Advancing Knowledge

Research reports contribute to growing knowledge in a specific area. They help solve problems, answer questions, and provide new insights that can be used by others.

7. Professional Growth

Writing research reports is an important skill for academic success and career advancement. It shows you can do serious research and communicate your findings effectively.

8. Ethical Transparency

A research report shows how your study was conducted, ensuring that your methods were ethical and that your findings are trustworthy.

STEPS IN WRITING REPORT

Understand Purpose
Identify the objective of the report: informational, analytical, or recommendation-based.
Know the audience: teachers, management, or external stakeholders.

Collect & Organize Information
Gather relevant **data, facts, and references**.
Take **notes** and categorize information logically.
Verify **accuracy and credibility** of sources.

Plan Structure
Decide on **sections** and sequence: introduction, body, conclusion, etc.
Create an **outline** or flowchart for clarity.

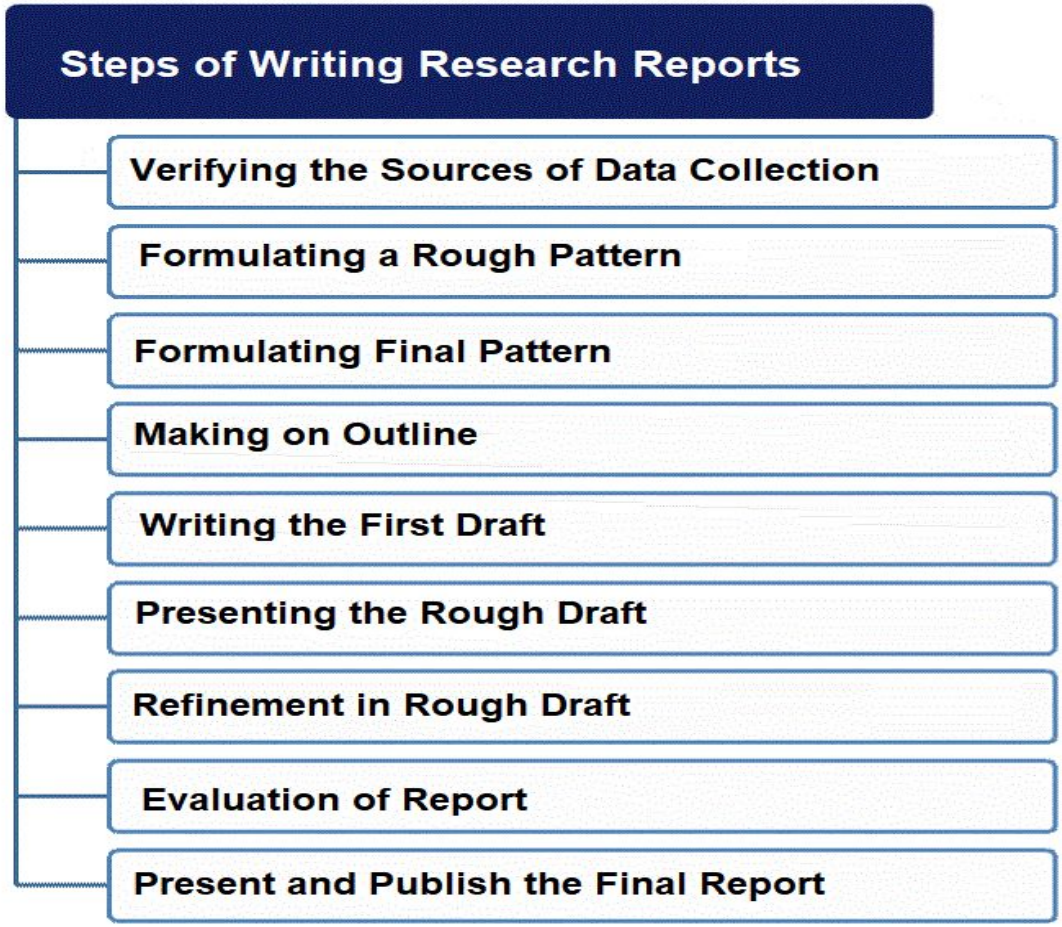
Write the Draft
Title Page: Report title, author, date, and organization.
Abstract/Executive Summary: Short overview of purpose, findings, and conclusions.
Introduction: Context, objectives, and scope of the report.
Methodology: How data was collected or research conducted.
Body/Findings: Present results, analysis, and discussion.
Conclusion/Recommendations: Summarize key points and suggest actions.
References/Bibliography: List sources cited.
Appendices (if needed): Supplementary material like charts, tables, or graphs.

Review & Edit

- Check for **clarity, coherence, and logical flow**.
- Correct **grammar, punctuation, and formatting**.
- Ensure all **tables, figures, and references** are accurate.

Finalize and Format

- Apply **consistent formatting** (fonts, headings, numbering).
- Include **page numbers, headings, and captions**.
- Prepare for **submission or presentation**.



DIFFERENT STEPS IN WRITING REPORT

The usual steps involved in writing report are:

a) Logical analysis of the subject-matter;

b) Preparation of the final outline;

c) Preparation of the rough draft;

d) Rewriting and polishing;

e) Preparation of the final bibliography; and

(f) Writing the final draft.

DIFFERENT STEPS IN WRITING REPORT

a)Logical analysis of the subject matter:

It is the first step which is primarily concerned with the development of a subject.

There are two ways in which to develop a subject

(a) logically and

(b) chronologically.

- Logical treatment means organizing ideas from the simplest to the most complex.
- You start with the basics and gradually build up to more complicated ideas.
- **Chronological development** is about arranging things in the order they happen over time.
- It follows a timeline, showing events or ideas in the sequence they occur.

b)Preparation of the final outline

Research Paper Outline

I. Introduction (2-3 paragraphs)
- **A. Story, quote, questions, something of interest**
- **B. Statement of the problem (your 'why' question)**
- **C. History of the problem**
- **D. Thesis**

II. Body Section One (4-6 paragraphs)
- **A. Extent of the problem / How bad is it?**
  1. **What has happened**
  2. **Why should we be concerned**
- **B. Who is affected / how are they affected**
  1. **Examples**
  2. **Stories**
  3. **Facts**

III. Body Section Two (3-4 paragraphs)
- **A. Cause/Effect:**
  1. **Because of this problem, this has happened….**
- **B. Repercussions of the problem**
  1. **If we don't solve, this will happen…**

IV. Body Section Three (1-3 paragraphs)
- **A. Possible solutions**
  1. **What will work**
  2. **What will not work**
  3. **Possible oppositions**

V. Conclusion (1-2 paragraphs)
- **A. Relate back to intro (story/quote/question)**
- **B. Restate thesis/clincher**

- **It is the next step in writing the research report**
- **"Outlines are the framework upon which long written works are constructed.**
- **They are an aid to the logical organization of the material and a reminder of the points to be stressed in the report"**

c)Preparation of the rough draft:

- The rough draft is prepared once the topic has been analyzed and the final outline is created.
- The researcher starts writing down the findings and ideas from their research.
- This stage is crucial as it transforms the research work into written form.
- The rough draft helps put the research into the proper context, organizing the study's ideas clearly.

d)Rewriting and polishing of the rough draft:

- This step is usually the most difficult part of the entire writing process.
- It often requires more time than writing the rough draft.
- Careful revision is key to improving the quality of writing.
- Proper revision turns an average piece of writing into a good one.

e)Preparation of the final bibliography:

- Next, the researcher prepares the final bibliography.
- This is a list of books and sources that are relevant to the research
- The bibliography is usually added at the end of the research report.

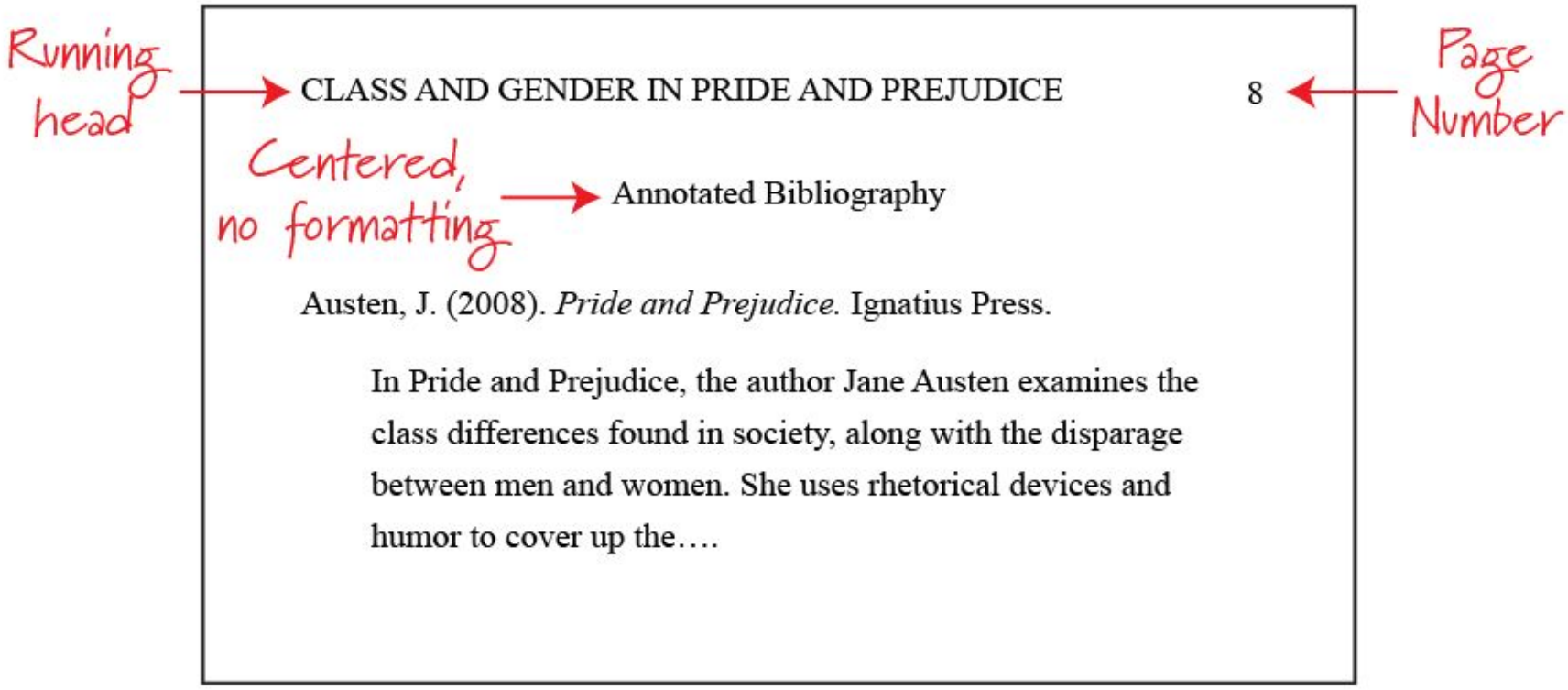
For books and pamphlets the order may be as under:

1. Name of author, last name first.
2. Title, underlined to indicate italics.
3. Place, publisher, and date of publication.
4. Number of volumes.

Example

Kothari, C.R., *Quantitative Techniques,* New Delhi, Vikas Publishing House Pvt. Ltd., 1978.

Example of Annotated Bibliography in APA Format



Tips:

- Times New Roman 12 pt., Double-spaced
- 1" margins
- Running head and page number 1/2" down
- 'Annotated Bibliography' 1" down

f)Writing the final draft:

•This is the last step in the process.

•The final draft should be clear, concise, and written in simple language.

•One should stay away from vague expressions like "it seems" or "there may be.“

•Include illustrations and examples that people can relate to, as they help make the research easier to understand

•The report should be interesting, creative, and not dull. It should capture
• attention and show originality.

LAYOUT OF THE RESEARCH REPORT

A comprehensive layout of the research report should comprise:

(A) **Preliminary pages;**
(B) The main text; and
(C) The end matter.

(A) Preliminary Pages

- In its preliminary pages the report should carry a *title and date,* followed by acknowledgements in the form of 'Preface' or 'Foreword'.

- Then there should be a *table of contents* followed by *list of tables and illustrations* so that the decision-maker or anybody interested in reading the report can easily locate the required information in the report.

(B) Main Text

The main text of the report should have the following sections:

(i) Introduction;
ii) Statement of findings and recommendations;
ii) The results;
v) The implications drawn from the results; and
v) The summary.

(i) Introduction:

- The purpose of introduction is to introduce the research project to the readers.
- It should contain a clear statement of the objectives of research… why the problem was considered worth investigating.

(ii) *Statement of findings and recommendations*: *S*tatement of findings and recommendation should be in non-technical language, so that it can be easily understood by all concerned.

(iii) *Results:*

- A detailed presentation of the findings of the study, with supporting data in the form of tables and charts put together with a validation of results, and
- It is the next step in writing the main text of the report.
- This generally comprises the main body of the report, extending over several chapters

(iv) ***Implications of the results:*** Toward the end of the main text, the researcher should again put down the results of his research clearly and precisely.

(v) ***Summary:*** It has become customary to conclude the research report with a very brief summary by –

Restating the Research Problem: A brief reminder of the main question or issue the research aimed to address. This helps readers understand the focus of the study.

Methodology Overview: A quick summary of how the research was conducted, including the general approach or design (qualitative, quantitative, experimental, etc.) and the main methods used (e.g., surveys, experiments, observations).

Major Findings: A summary of the most important results from the study, highlighting key patterns or outcomes. These should be concise and to the point.

Conclusions: State the main takeaway from the findings or the major conclusions drawn from the research results.

(C) End Matter

At the end of the report, include the following:

Appendices:

List technical materials such as questionnaires, sample data, and mathematical derivations.

Bibliography:

List all sources consulted during the research.

Index:

Provide an alphabetical list of names, places, and topics with corresponding page numbers.

Example:

Appendices

Appendix A: Survey Questionnaire

Appendix B: Sample Information

Bibliography

Author, A. (Year). *Title of Book/Article*. Publisher.

Index

Caffeine, 15, 20

Productivity, 10, 18

Name of the thesis

Thesis submitted to:

XYZ UNIVERSITY, City

For the Degree of

DOCTOR OF PHILOSPHY

Submitted by :
XYZ
Under the Supervision of :
Prof. ABC
INSTITUTE OF MANAGEMENT STUDIES & RESEARCH
XYZ UNIVERSITY, City, HARYANA [INDIA]
Date

The Preliminary (Prefatory Pages)

- The Title Page
- Acknowledgement
- Researcher's Declaration
- Research Supervisor's Certificate
- Abstract
- Table of content
- List of tables
- List of figures
- List of abbreviations

RESEARCHER'S DECLARATION

I declare that the thesis entitled "……" is a record of independent research work carried out by me under the supervision and guidance of Prof. XYZ. This has not been previously submitted for the award of any other diploma, degree or other similar title.

Place:…

Date:……

(NAME)

Signature of the Researcher

RESEARCH SUPERVISOR'S CERFICIATE

Certified that the thesis entitled "……." submitted to the **XYZ University, City** for the award of degree of Doctor of Philosophy is a record of independent research work carried out by Mr./Ms….. a Research Scholar Ph.D. programme, under my supervision and guidance. This has not been previously submitted for the award of any diploma, degree or other similar title.

Place **(Name)**

Date **Signature of the Supervisor**

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LIST OF TABLES

LIST OF FIGURES

LIST OF NOTATIONS

IV	importance value
RA	Relative abundance
RD	Relative density
Rdom	Relative dominance
CI	Complexity index
TR	Taxon Richness
d	Stem density, a- Basal area,
h	Tree height
ANOVA	Analysis of variance

The Reference Section (End matter)

- Reference
- Appendices
- Bibliography
- Index

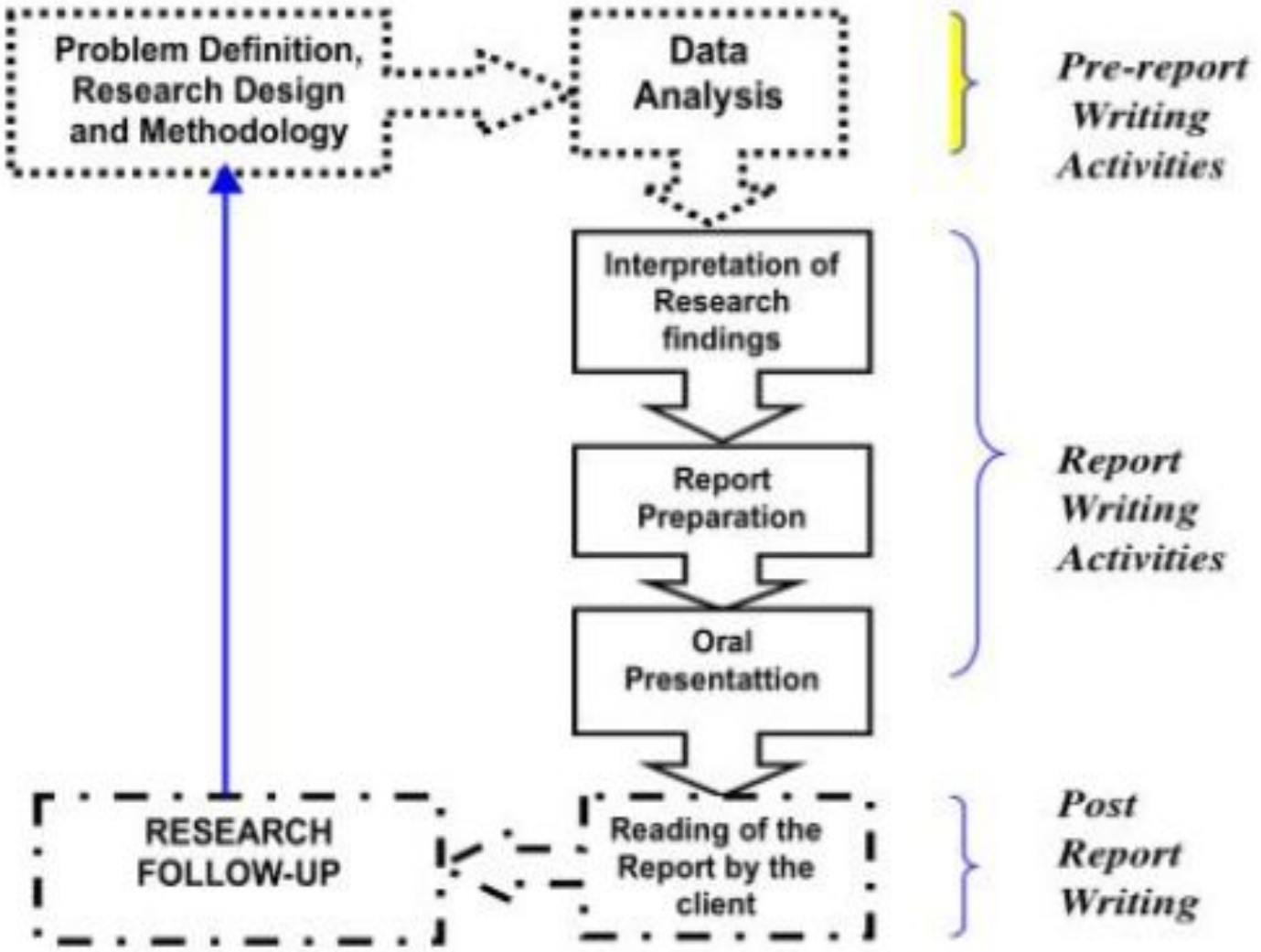
REFERENCE

1.) Kihia C. M. – "*Impact of Human Physical Disturbance on Mangrove Forest Structure at the Gazi Bay, Kenya*". Egerton Journal of Science & Technology, ISSN No. 2073 – 8277 2014

2.) Hema, M. and Indira Devi, P. – "*Factors of mangrove destruction and management of mangrove ecosystem of kerala, india*" – 2012

APPENDIX

REPORT PREPARATION AND PRESENTATION PROCESS

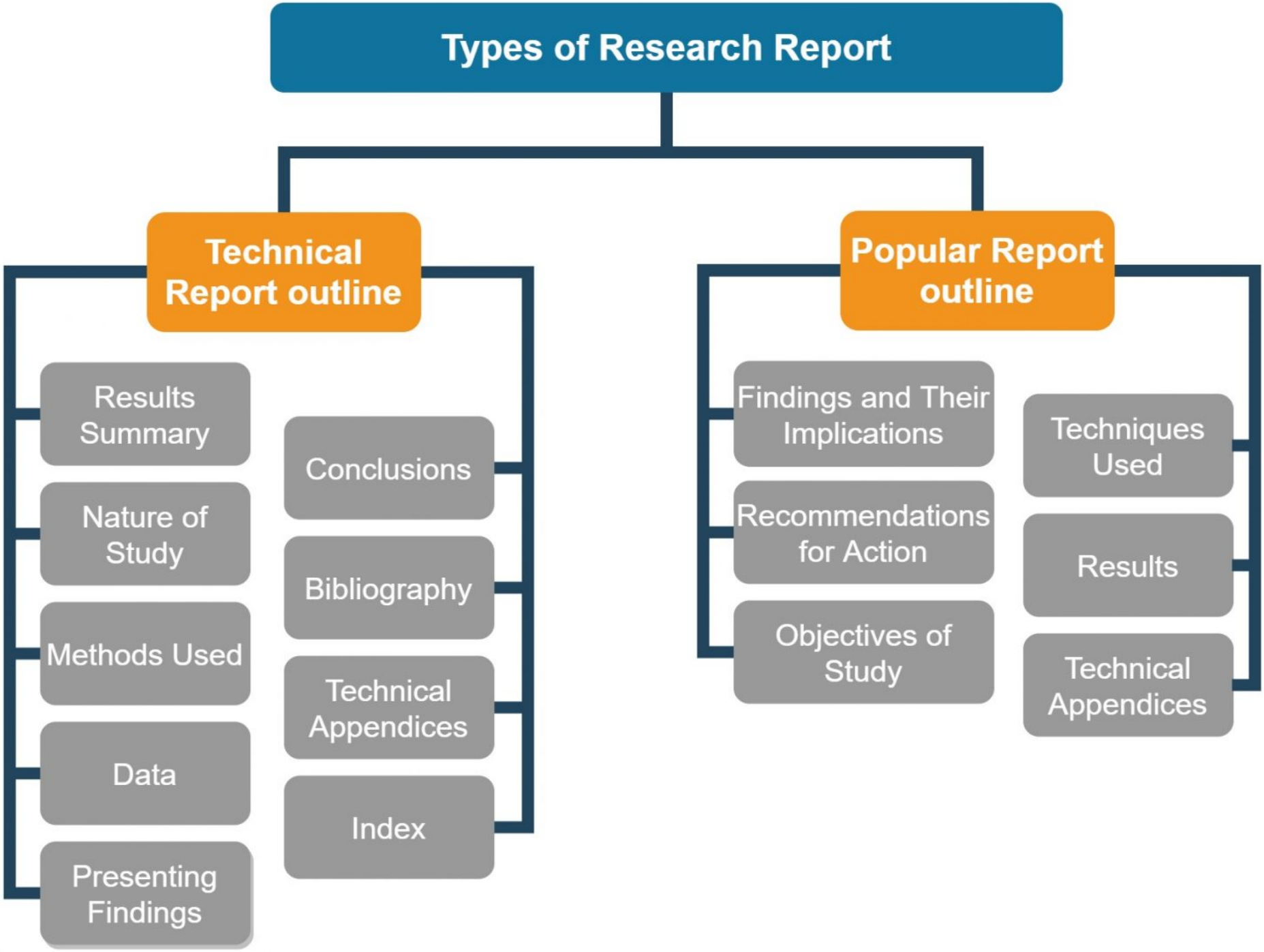


Types of Research Report I

- Any research report contains:
  - descriptions on methodology,
  - results obtained,
  - and recommendations made.
- The basic orientation of a research report depends on its audience. Before writing the report
  - the researcher must know his or her audience;
  - he/she may have to make assumptions about the composition, background and interests of the target readers.

Types of Research Report II

- **Two types of reports:-**
  - **Technical Report: suitable for a target audience of**
    - **researchers, research managers or other people familiar with and interested in the technicalities such as research design, sampling methods, statistical details etc.,**
  - **Popular Report: suitable for:**
    - **a more general audience, interested mainly in the research findings as it is non-technical in nature.**
  - **The writing style is designed to facilitate easy and rapid reading and understanding of the research findings and recommendations.**


Types of Research Report
Technical Report outline
Results Summary
Nature of Study
Methods Used
Data
Presenting Findings
Conclusions
Bibliography
Technical Appendices
Index
Popular Report outline
Findings and Their Implications
Recommendations for Action
Objectives of Study
Techniques Used
Results
Technical Appendices

TYPES OF RESEARCH REPORT

(A) Technical Report

In the technical report, the main emphasis is on:

i. The methods employed,
ii. Assumptions made in the course of the study,
iii. The detailed presentation of the findings including their limitations and supporting data.

A general outline of a technical report can be as follows:

1. ***Summary of results:*** A brief review of the main findings just in two or three pages.

2. ***Nature of the study:*** Description of the general objectives of study, formulation of the problem in operational terms, the working hypothesis, the type of analysis and data required, etc.

3. ***Methods employed:*** Specific methods used in the study and their limitations. For instance, in sampling studies we should give details of sample design viz., sample size, sample selection, etc.

4. ***Data:***

Discuss the data collected, where it came from, its features, and any limitations.

If secondary data is used, explain how suitable it is for the problem. If a survey was done, describe how the data was collected.

5. ***Analysis of data and presentation of findings:***

The analysis of data and presentation of the findings of the study with supporting data in the form of tables and charts be fully narrated.

This, in fact, happens to be the main body of the report usually extending over several chapters.

6. ***Conclusions:***

A detailed summary of the findings and the policy implications drawn from the results be explained.

7. Bibliography:

Bibliography of various sources consulted be prepared and attached.

8. ***Technical appendices:***

Appendices be given for all technical matters relating to questionnaire, mathematical derivations, elaboration on particular technique of analysis and the like ones.

9. ***Index:***

Index must be prepared and be given invariably in the report at the end.

(B) Popular Report

1. ***The findings and their implications:*** Emphasis in the report is given on the findings of most practical interest and on the implications of these findings.

2. ***Recommendations for action:*** Recommendations for action on the basis of the findings of the study is made in this section of the report.

3. ***Objective of the study*****:** A general review of how the problem arise is presented along with the specific objectives of the project under study.

4. ***Methods employed*****:** A brief and non-technical description of the methods and techniques used, including a short review of the data on which the study is based, is given in this part of the report.

5. ***Results:*** This section constitutes the main body of the report wherein the results of the study are presented in clear and non-technical terms with liberal use of all sorts of illustrations such as charts, diagrams and the like ones.

6. ***Technical appendices:*** More detailed information on methods used, forms, etc. is presented in the form of appendices. But the appendices are often not detailed if the report is entirely meant for general public.

ORAL PRESENTATION

HOW TO MAKE AN ORAL PRESENTATION (1)

Choose the right subject.

Do proper research.

Create an outline.

Write out your presentation.

Rehearse with visual aids and props.

ORAL PRESENTATION

Outline

- Planning
- Preparation
- Practice
- Performance
- Questions

STRUCTURE OF A TEN-MINUTE TALK

- Background (1-2 slides)
- Aim of the study (1 slide – essential!)
- Brief methods (1 slide)
- Results (4-8 slides)
- Summary (1 slide)
- Conclusions (1 slide)

Introduction

- An oral presentation is a short talk on a set topic given to a tutorial/researcher or seminar group. In an oral presentation one (or more) presenters give a talk to a audience group and present views on a topic based on their readings or research. The rest of the group then joins in a discussion/cross questioning of the topic.

ORAL PRESENTATION MEANS

- Presenting research paper
- Preparing and delivering a talk
- Leading a group discussion
- Preparing handouts and visual aids
- Submitting a written assignment based on the presentation topic

Modes Of Presentation

- PowerPoint presentation
- Overhead projector
- Poster

WHAT TO PRESENT AND PLAN

- Following should be considered

- Concept of the seminar/conference
- Types/number of audience
- Duration allotted
- Requirements

PREPARING PRÉSENTATION

- Preparing an oral presentation is much like preparing any other assignment; it needs to be planned researched and written before it is delivered.

1. Plan your presentation.
2. Plan your visual.
3. Design your visual.
4. Plan your graphics.

STRUCTURE OF ORAL PRESENTATION

- A good oral presentation is well structured; this makes it easier for the listener to follow.
- Basically there are three pa presentation: the
- Beginning(INTRODUCTION
- the middle and (BODY)
- the end (CONCLUSION)

INTRODUCTION/BEGINNING

An introduction is like a road map that tells your audience the direction your presentation will take.

- State your topic and tell the audience what your presentation will cover.
- Outline the main points.

A good introduction will capture an audience's attention.

Start your talk by greeting the audience
and introducing yourself.

- State your topic clearly. For example:
- 'I'm going to talk about...'
- 'Today I'd like to discuss...'
- Provide an outline of the main points.
- Provide any necessary background or definition of terms.

BODY/MIDDLE

- This is the further progression part of the presentation. The body of your presentation is where you develop the main points and present examples and evidence.
- Make sure you provide clear links between main points, explanations and examples.
- Use visual aids to engage the interest of your audience and 'show' instead of just 'tell'.
- Emphasize important information. Tell your audience when information is particularly important or interesting. Tell them Why.

Body.....

- Use verbal 'signposts' to guide your audience through the presentation, highlight key points and indicate the different sections of your presentation.
- 'Another point is...'
- 'A contrary view to consider is'
- 'In conclusion'
- Move from one point to the next by using phrases (such as 'Firstly ...secondly' ... 'finally').
- Introduce supporting evidence 'For example...' '[Author name] states that ...'

CONCLUSION/THE END

- The conclusion is usually a summary of the main points made in the body of the talk.
  - Restate the main points.
  - Re-answer the question.

- Don't introduce any new information in the conclusion. Take

the opportunity to show that you have covered all the points you made in your introduction.

MECHANICS OF WRITING A RESEARCH REPORT

1.Size and physical design:

- ✔ The manuscript should be written on unruled paper 8 1/2″ × 11″ in size
- ✔ If it is to be written by hand, then black or blue-black ink should be used.
- ✔ A margin of at least one and one-half inches should be allowed at the left hand and of at least half an inch at the right hand of the paper.
- ✔ There should also be one-inch margins, top and bottom.
- ✔ The paper should be neat and legible.
- ✔ If the manuscript is to be typed, then all typing should be double-spaced on one side of the page only except for the insertion of the long quotations.

2. ***Procedure****:* Various steps in writing the report should be strictly adhered

3. ***Layout****:* Keeping in view the objective and nature of the problem, the layout of the report should be thought of and decided and accordingly adopted

4. *Treatment of quotations:*

Quotations should be in quotation marks and double-spaced, becoming part of the main text.

If a quotation is long (more than four or five lines), it should be single-spaced and indented at least half an inch from the normal text margin.

5. *The footnotes:*

(a)Footnotes serve two main purposes:

1.to identify the sources of quotations used in the report and

2.to provide additional information that is not essential to the main text but still adds value.

(b) Footnotes are placed at the bottom of the page where the reference or quotation appears.

(c) Footnotes should be numbered consecutively, typically starting with 1 for each chapter.

(d) Footnotes are typed in single space, with a double space between each one.

6. *Documentation style:*

Regarding documentation, the first footnote reference to any given work should be complete in its documentation, giving all the essential facts about the edition used. Such documentary footnotes follow a general sequence.

The common order may be described as under:

(i) ***Regarding the single-volume reference***

1. Author's name in normal order (and not beginning with the last name as in a bibliography) followed by a comma;
2. Title of work, underlined to indicate italics;
3. Place and date of publication;
4. Pagination references (The page number).

Example

John Gassner, *Masters of the Drama,* New York: Dover Publications, Inc. 1954, p. 315.

(ii) ***Regarding multivolumed reference***

1. Author's name in the normal order;
2. Title of work, underlined to indicate italics;
3. Place and date of publication;
4. Number of volume;
5. Pagination references (The page number).

(iii) ***Regarding works arranged alphabetically***

For works arranged alphabetically such as, encyclopedias and dictionaries, no pagination reference is usually needed. In such cases the order is illustrated as under:

Example 1

"Salamanca," *Encyclopaedia Britannica,* 14th Edition.

7. *Punctuation and abbreviations in footnotes:*

The first item after the number in the footnote is the author's name, given in the normal signature order. This is followed by a comma. After the comma, the title of the book is given: the article (such as "A", "An", "The" etc.) is omitted and only the first word and proper nouns and adjectives are capitalized.

The title is followed by a comma. Information concerning the edition is given next. This entry is followed by a comma.

PRECAUTIONS FOR WRITING RESEARCH REPORTS

- The report should be long enough to cover the topic, but not so long that it loses the reader's interest.
- The report should be interesting and avoid being boring.
- Use simple and clear language, and avoid complex terms or uncertain phrases like "it seems" or "there may be.“
- Readers want to quickly understand the main findings, so the report should make those easy to find.
- Use charts, graphs, and tables to present results, along with a summary of key points.
- The layout of the report should be clear and match the goals of the research.
- The report must be free of grammar mistakes and follow proper writing techniques, such as correct use of quotations, footnotes, documentation, punctuation, and abbreviations.
- The report should present a logical analysis of the topic, where all parts of the analysis connect well with the research problem.

- A research report should be original, aiming to solve an intellectual problem and contribute new knowledge.

- Near the end, the report should discuss the policy implications of the research and suggest possible future developments or areas for further study.

- Appendices should include all technical data referenced in the report.

- A bibliography of sources used is essential for a good report and must be included.

- An index is also important and should be added at the end of the report.

- The report should look attractive, neat, and clean, whether typed or printed.

- The report must mention the calculated confidence limits and describe any challenges faced during the research.

- The report should clearly state the study's objective, the nature of the problem, the methods used, and the analysis techniques in the introduction.

Free Writing and Mining ideas

Free writing is a technique where a person writes continuously without worrying about grammar, punctuation, or structure.

To allow ideas to flow freely, often resulting in unexpected insights. Free writing is used as a method to stimulate creativity, overcome writer's block, and discover new ideas.

Benefits of Free Writing

1. **Unleashes creativity:** Encourages open and original thinking
2. **Generates raw material**: It can help you come up with a variety of ideas
3. **Clarifies thoughts**: Free writing often helps you organize and focus your thoughts
4. **Discovers connections**: It can help reveal connections between ideas that you might not have considered otherwise.
5. **Promotes flow**: It can serve as an effective warm-up exercise before more structured writing or research.

How to Do Free Writing

1. **Set a time limit** (e.g., 10-15 minutes).
2. **Write without stopping**: Don't worry about making mistakes or refining your writing during the process.
3. **Focus on the topic**: While you should allow your mind to wander, try to remain connected to the central theme of your research or project.
4. **Review and refine**: After the time is up, go back through your writing to highlight useful insights and organize them.

Mining Ideas

Mining ideas involves exploring and extracting concepts, facts, or possibilities from a particular topic, field of research, or set of materials.

It can be done through various techniques, including but not limited to brainstorming, free writing, reading extensively, and collecting data or experiences.

Techniques for Mining Ideas:

Brainstorming: Generate lots of ideas quickly, without judgment, to find patterns or new research angles.

Mind Mapping: Visualize ideas in a network to see how concepts connect.

Reading and Research: Explore a variety of sources, from academic papers to blogs and podcasts.

Personal Experiences: Reflect on your own or others' experiences related to the topic.

Creative Constraints: Set limits or use unusual perspectives to focus and spark new ideas.

Idea Mining Steps

- **Define the research scope**: Clearly understand what you're researching and the questions you're trying to answer.
- **Gather raw materials**: This could include existing research, literature, notes, or personal insights.
- **Extract key themes**: Look for repeating patterns, surprising connections, or any novel angles.
- **Refine the ideas**: Once you've identified several potential directions, start organizing and developing these concepts into more structured outlines or hypotheses.
- **Test and evaluate**: Continuously assess the viability and relevance of your ideas against your research objectives.

Combining Free Writing and Idea Mining:

By combining free writing with idea mining, you can enhance the creative process and refine your research direction, like:

- **Start with free writing** to generate raw thoughts and ideas related to your topic.

- **Use mining techniques** (like brainstorming or mind mapping) to organize and evaluate the ideas you've uncovered.

- **Refine your insights** by considering the connections, contradictions, or opportunities you've discovered.

Example: Research Topic — *Sustainable Urban Development*

- ***Free Writing****: You might write down your thoughts about the future of cities, what makes urban areas sustainable, the challenges cities face in adapting to climate change, or innovations that might change city life.*

- ***Mining Ideas****: After free writing, you could mine for themes related to renewable energy, green spaces, smart cities, public transportation, or community engagement. Use mind maps or literature review to extract specific challenges or success stories from global case studies.*

Incorporating both free writing and idea mining into your research methodology can significantly enhance the depth, creativity, and originality of your work.

ATTRIBUTES/CHARACETERISTICS OF TECHNICAL WRITING

- **It pertains to a technical subject: specialized topics** such as engineering, science, computer applications, or research.
  Example: Writing about how a machine works, or explaining a scientific process.
- **It has a purpose:**to inform, explain, instruct, or report findings.
  Example: A lab report aims to present experimental results clearly.
- **It** has an objective:The goal is to communicate information accurately and effectively
- It conveys information/facts/data: based on **facts, data, and logical reasoning** rather than opinions
- **It is impersonal:**Writers avoid personal pronouns like *I* or *we*, and instead focus on the subject matter.
  Example: "The experiment was conducted…" instead of "We did the experiment."
- **It is concise:**Technical writing should be **short, clear, and to the point**.
  Unnecessary words or details are avoided.
- **It is directed:**is written for a **specific audience** (e.g., engineers, researchers, or students) and serves their needs.
- **It is performed with a particular style and in a particular format:** headings, bullet points, and figures.
- **It is archival:** permanent records that can be stored and referred to later — like research reports, manuals, or data sheets.
- **It cites contributions of others:** Technical documents follow **standard structures** (like reports, manuals, or proposals) and **formal writing conventions** such as headings, bullet points, and figures.

Pertains/belong to a Technical Subject

Technical writing must pertain to some aspect of engineering or the sciences in a given subject area such as the following:……

Philosophy, psychology, and religion,
History,
Geography and anthropology,
Social sciences,
Political science,
Law,
Education,
Fine arts,
Language and literature
Science
Agriculture
Technology
Health/Medicine

Has a Purpose

- A technical document always is written for a reason, and the purpose of reports may be to explain what was done, why it was done, and/or the results of a study.
- The purpose of reports on investigations is usually to present the results of the study.
- The purpose of reports and papers should also be clearly stated.
- This excerpt identifies the purpose of the report as the presentation of results from a statistical study.
- Readers are also informed why the author(s)did the work. If the report is done correctly, it will also close with recommendations on what should happen next

Has an Objective

- The objective of a technical report is the overall reason for doing the work.
- In an industrial situation, the objective of any work is usually to make or increase profits.
- In the preceding example, the objective was to reduce failure rates to a level
- This will save money and in-crease profits.
- Discriminating between purpose and objective requires some practice, and this distinction is discussed in more detail again in the chapters on strategies and introduction

Conveys Information/Facts/Data

- Technical writing should have substance in every statement.
- If a sentence does not convey information pertinent to a study, leave it out.
- Technical writing is focused on the technology under discussion.
- A report without facts or scientific evidence to support an opinion also usually lacks credibility, and it is likely to be unsuccessful in achieving its purpose and objective.
- The following report excerpt illustrates reports with and without data.

Most reports need facts or data to support conclusions and recommendations,
and the verbs listed here are probably associated with factual statements:·····

Determined,Solved,Built,Accepted,Rejected,Completed,Passed,Failed, Broke,Approved,Cancelled,Invented,Designed,Developed,Discovered, Uncovered

Verbs that are often not associated with factual statements include words like the following:·····
Think
May be
Suggest
Appear
Suppose

Impersonal (Third Person) Voice

- ✔ The use of first person pronouns is usually discouraged in technical writing.
- ✔ The intrusion of “I” makes the work less authoritative.
- ✔ Similarly, it is inappropriate to use names of people and/or trade names unless there is no other way to describe the item.
- ✔ With regard to using people’s names in reports, it is not necessary and it reads “unprofessional.”
- ✔ In addition, it adds length, and anything that adds unnecessary length to a document should not be done.
- ✔ If the intent of including names is to give credit, the correct placement of credits is not in the body of a report
- ✔ Credits belong in end-of-document acknowledgments,which will be covered in a subsequent Chapter.
- ✔ Personal pronouns and names should be omitted because they are unnecessary be avoided because of liability considerations.

BE CONCISE

Technical reports are usually written for business reasons.
They are not intended to entertain; they communicate information to an identified person or group.
Wandering sentences and extra words reflect badly on the author and often have a negative effect on the readership that you are trying to reach.

Example 1:

Wordy

Polymer surfaces were studied to determine if physical surface changes occur with continued UV exposure. This program was necessitated to meet customer expectations for a longtime company with world-class name recognition. If surface degradation is in fact occurring, we need to ascertain and assess the severity of this degradation. Moreover, it is imperative that we address any product deficiencies so that the company image as a supplier of robust products is not denigrated.

Preferred

A study was conducted to quantify UV damage to polymer surfaces. This work was done to satisfy customer concerns about the weather ability of sun shields made from our outdoor grade of polypropylene.

Example 2:

Not Concise

The biopsy results were negative. Nonetheless, the nurse-practitioner sent a sample for retest to be sure.

Preferred

The biopsy results were negative, but the nurse-practitioner sent a sample for retest to be sure

Directed to Readers

Technical reports must be directed to a particular readership.

The author is responsible for determining the specific individuals or parties who will receive a technical document.

Writing should be aimed at the readership.

Directing a report determines the technical level of the writing.

If you direct a report to your coworkers, you donot have to bring them up to speed on the organization of your department.

They already know it.

Archival

An intrinsic part of the value of technical writing is that it is written in such a manner that it can be archived and produce valuable and usable information in the future.

Conversely, technical documents should not be generated on transient issues or subjects that will not be pertinent in the future

THE FORMAT

(the basic elements and their placement) of technical papers and reports is a more structured one than that used for other forms of writing.
Formal technical reports have basic elements and a structure as follows:·····

Introduction (why you are doing the work)

Procedure (what you did)

Results (what happened)

Discussion (what it means)

Conclusions (what was learned)

Recommendations (what is to be done with the new information or knowledge)

CONTRIBUTION TO OTHERS

Giving Acknowledge to others by citations and references.


Writing & Research Strategies
Understanding academic writing
Understanding writing assignments
Exploring/ focusing a topic
Finding research sources
Evaluating research sources
Using sources ethically
Crafting a thesis statement
Organizing your evidence
Drafting and revising

Technical Writing

Writing helps:

- to communicates thoughts, ideas and knowledge
- In solving / organising complex problems (through equations, drawings, graphs, organising thoughts, etc.)

Categories of technical writing

Reports and communications	• disseminate technical information • Often includes engineering drawings. • communicate technical viability of designs
Technical papers, articles, and books	• authored by academics (or professionals) in their area of experience and knowledge
Patents	• legal record that bestows the holder the exclusive right over an invention
Operational manuals, instructions, procedures	• usually written by a technical expert with possible inputs from a legal expert.

Technical Writing

Free Writing:

- For personal usage, not shown to anyone
- Write-ups of thoughts and idea before the actual writing

Technical Writing:

- = Structured and formal writing sharing technical information / knowledge
- Reader-centred (to understand the reader)
- Provide only supporting material that directly supports the message
- If question raises in the reader's mind, answer it soonest possible.

Purpose:

- what was done,
- why was it done
- results of research work
- what should be done next (recommendation)

Characteristics:

- in third person
- every statement should carry meaningful information / message
- each claim should be substantiated by data and factual information and not opinion
- state the message in the fewest words

Structure and Approach

Typical structure: (subjected submission guideline of the journal or thesis)

Journal paper

Beginning	Title Abstract Introduction
Body	Methodology Results Discussions
Closure	Conclusions Future work References

**subjected submission guideline of the journal*

Thesis / dissertation

- Title
- Abstract
- 1. Introduction
  - Background of Study
  - Problem statements
  - Objectives
  - Scope of study
  - Significance of study
- 2. Literature review
- 3. Methodology
  - Material
  - Instrumentation
  - Test program
- 4. Results and Analysis
  - Results
  - Analysis
  - Discussion
- 5. Conclusion
  - Summary
  - Conclusion
  - Recommendations
- Reference

**similar set of components*

Language Skills, Writing Style, and Editing

- Avoid overuse of complex words / jargon
- concise – fewest words possible
- Mind the punctuation and grammar
- Proofread by a trusted peer / software
- Writing style – consistent, objective and impersonal
- Minimize repetitive set of words in successive sentences
- Tenses

Reader friendly

- Effectively communicate message
- make the reader look forward to what comes next.
- arrange the material in such a way that it leads the reader to the intended conclusion

Tenses

- Simple past for specific methods
- Simple present for facts
- present perfect for general findings or many studies

Tenses: Present, past, future

Tense	Used for	Example sentences
Simple present	• happens regularly, repeatedly, or is always/generally true. • state established scientific facts and findings, theories, definitions and so on.	• Air is 79% nitrogen. • Figure 1 shows … • This section presents … • This type of vinegar contains about 3% acid.
Present perfect	• happened at an unspecified time in the past, • began in the past and is still current today. • announce a new finding or an advance in a particular discipline.	• Researchers have developed a new system for converting ocean wave motion into energy. • The sea level has changed throughout the Earth's history and will continue to do so.
Simple past	• that is clearly past, • that has a clear time reference (e.g. 2013, three months ago, etc.)	• Marie Curie conducted pioneering research on radioactivity. • Watson (2000) first used this procedure more than a decade ago.
Simple future	• Making predictions, • announcing future work/research, • talking about later parts of the document	• Demand will outweigh supply and prices will rise. • Future work will involve investigating the causes for these defects. • The final chapter will discuss the implications of these findings.

Subject–verb agreement

Singular or plural

- This study investigates
- The results indicate

Indefinite pronouns: either, neither, each

- Neither of the models is applicable
- Each of the models has flaws.

Compound subjects

- Neither the circuit nor the transistors were modified.

(the verb should agree with the last item in the subject. If comprises a singular noun and a plural noun, the plural noun should come after the singular noun.)

Common sentence problems

Fragments

- A complete sentence has the following three components:
  - A subject (the actor in the sentence)
  - A verb
  - A complete thought (that is, the sentence can stand alone and make sense)
- If any of these is missing from the sentence, it is a fragment.

Wrong	Correct
The types of applications range from games to office suites. *Enabling the owner to perform a wide array of tasks.* a fragment	The types of applications range from games to office suites. *These applications enable the owner to perform a wide array of tasks.* New sentence or The types of applications range from games to office suites, *enabling the owner to perform a wide array of tasks.* Combined sentence
The university wants to introduce more online courses. *Although a number of faculty are sceptical.* a fragment	The university wants to introduce more online courses *although* a number of faculty are sceptical.

Common punctuation problems

Commas (,): indicates a pause.

Usage of Comma	Example
After each item in a series	The experiments were carried out in a tank 1.8 m wide, 4 m long **and** 1 m deep.
separate a dependent clause from the main clause in a sentence	The evolution of a typical scouring profile along the longitudinal direction***, which is illustrated in Fig. 2,*** may be divided into four stages.
after an introductory phrase or dependent clause	***Although the Kyoto Protocol was signed in 2007,*** it has had limited impact on reducing global warming.
separate information that is not essential to the meaning of the sentence	This rapid growth in human population***, with the accompanying urban migration and industrialisation,*** has impacted water eco-systems around the world.
Differentiate the compound phrase	Most large technology companies have different departments, such as human resources, finance, *and* ***research and development*** working together to achieve the company goals

A, B and C (UK)
A, B, and C (US)

Dependent clause

It = Kyoto Protocol

Additional information

Compound "and"

Final "and"

Commonly misused words and phrases

Irregular plurals

Singular	Plural
Analysis	Analyses
Appendix	Appendices
Axis	Axes
Basis	Bases
Criterion	Criteria
Datum	Data
Focus	Foci
Formula	Formulae
Half	Halves
Hypothesis	Hypotheses

Singular	Plural
Matrix	Matrices
Medium	Media
Phenomenon	Phenomena
Radius	Radii
Research	Research
Self	Selves
Stimulus	Stimuli
Stratum	Strata
thesis	Theses

Do's of technical writing

Be clear

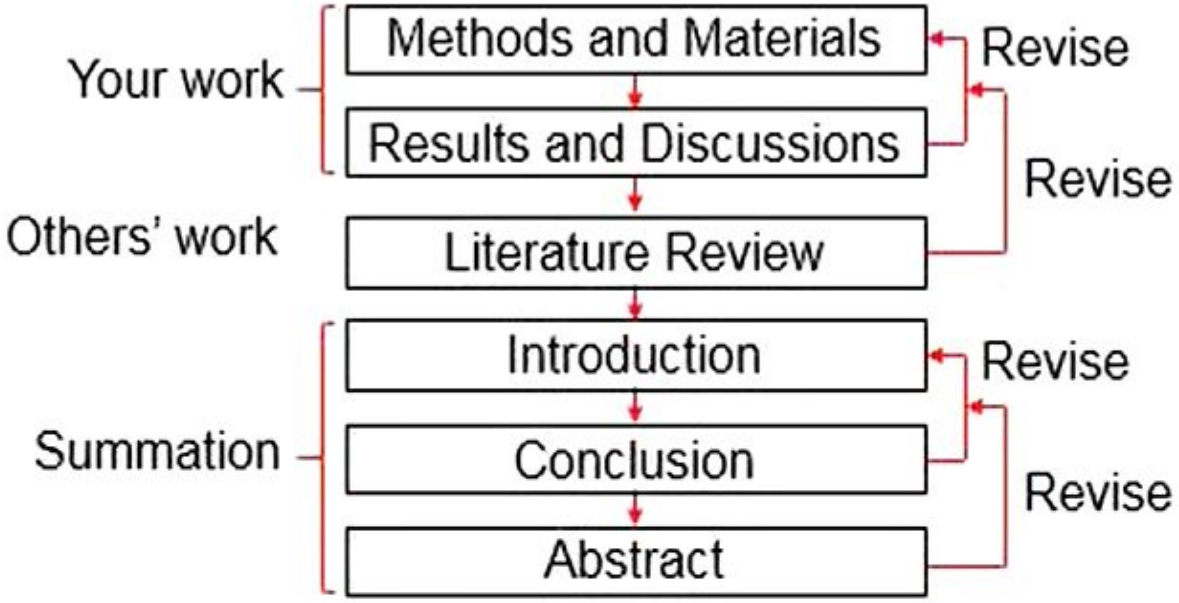
- Prefer plain words over unnecessary complex words and phrases

Complex word	Simpler substitute
Axiomatic	Self-evident, unquestionable
Apprise	Inform, tell
Elucidate	Explain, clarify
Endeavour	Try, attempt
Impugn	Challenge, question
Modicum	A small amount
Obfuscate	Obscure, complicate
Peruse	Read, study
Propensity	Tendency, inclination
Purvey	Sell, supply
Desultory	Superficial, casual
Egregious	Extremely bad

- Avoid writing excessively long sentences (i.e. 15 and 25 words)
- Avoid overloading your sentences with too many different ideas (i.e. 1 idea per sentence)

Strategies of technical writing

Making the first draft for your report or thesis



Revisions (several times) can be done sequentially, from the first chapter to the last chapter of your report or thesis, to ensure that the chapters are all logically connected.

Publishing articles to get cited

To get your articles cited, publish high-quality, impactful research in reputable journals, and make your work discoverable by using clear titles, strategic keywords, and online profiles.

Before and during publications

Publish quality work: Ensure your research is relevant, impactful, and well-written.
Choose reputable journals: Target journals with high impact and broad readership.
Write reviews or concept papers: These are often cited more than original research.
Craft strong titles: Make them short, clear, and keyword-rich.
Use keywords smartly: Add them to titles, abstracts, and headings for better searchability.
Self-cite when relevant: Refer to your past work to boost citations.
Collaborate: Co-authoring increases reach and impact.
Promote your work: Enhance visibility through academic platforms and networks.

After publications

- **Create profiles**: Use platforms like ORCID, Google Scholar, and Research Gate for discoverability.
- **Be consistent**: Keep your name and affiliation uniform across all publications.
- **Share widely**: Upload to preprint servers, include links in email signatures, and promote on social media.
- **Link your data**: Use public repositories to share datasets and boost citation impact.