

Course Title: Research Planning and Report Writing

Course Code: WL-711

Course Credit Hours: 3(1-4)

Course Incharge: Mr. Muhammad Safeer

Theory:

Introduction to nature of wildlife research enquiry, problem identification, objectives, analysis, development of hypothesis. Use of the library and the internet for literature search. Literature review, reference writing for books, journals, anonymous, internet etc. Selection of study subjects and size; development of study design. Research ethics.

Practical:

Development of research plan, preparation of synopsis, precautions in execution of research, data collection, tabulation, analysis of data graphically and statistically and presentation, exercise in interpretation of results, writing of results, logical inferring, composing and presentation of report.

Books Recommended:

1. Arifullah, S. and K. M. Bhatti. 1998. Research process simplified. Pen Graphic (pvt) limited, Islamabad.
2. Hashmi, N. 1983. Style manual of technical writing. Pakistan Economic analysis network project, Islamabad
3. Jones, A., R. Reed and J. Weyer. 1994. Practical skills in Biology. Longman Scientific and Technical.
4. O' Connor, M. 1993. Writing Successfully in Science. Chapman and Hall. N.Y.

Title, Author,
Abstract,
Keywords

- Descriptive information that lets readers search for an article.



Introduction

- What is the context for this project?
- How does it fit in with other research on the topic?
- *What is the research question?*

WHY?

Methods

- What did the author(s) do to answer the research question?

HOW?

Results

- What was the answer to the question?
- This is often shown in tables and figures.

WHAT?

Discussion/
Conclusion

- What is the significance of this project?
- How does it fit in with what else is known about the topic?

SO WHAT?

References

- Materials the author(s) cited when writing this paper.



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1. Introduction <ul style="list-style-type: none">• Problem statement• Research question• Motivation of the study• Context causing the question• Summarising findings• Importance of findings• Roadmap for readers	2. Literature Review <ul style="list-style-type: none">• Comprehensive and up to date• Command of literature• Problem contextualisation• Discussion selective, synthetic, analytical, thematic
3. Theory <ul style="list-style-type: none">• Appropriateness• Logically interpreted• Well understood• Aligns with the question discussed	4. Methods <ul style="list-style-type: none">• Appropriateness• Described in detail• Aligns with the question addressed and the theory• Demonstration of advantages and disadvantages of the methods• Usage of the methods
5. Results or Analysis <ul style="list-style-type: none">• Appropriateness• Aligns with the question and hypothesis raised• Sophisticated• Iterative• Sufficient• Well presented• Intelligently interpreted	6. Discussion or Conclusion <ul style="list-style-type: none">• Findings summarised• Perspectives provided• Refers to introduction• Provides overall cohesion• Discusses strengths and weaknesses• Provides implications and applications to the discipline• Discusses future directions for research

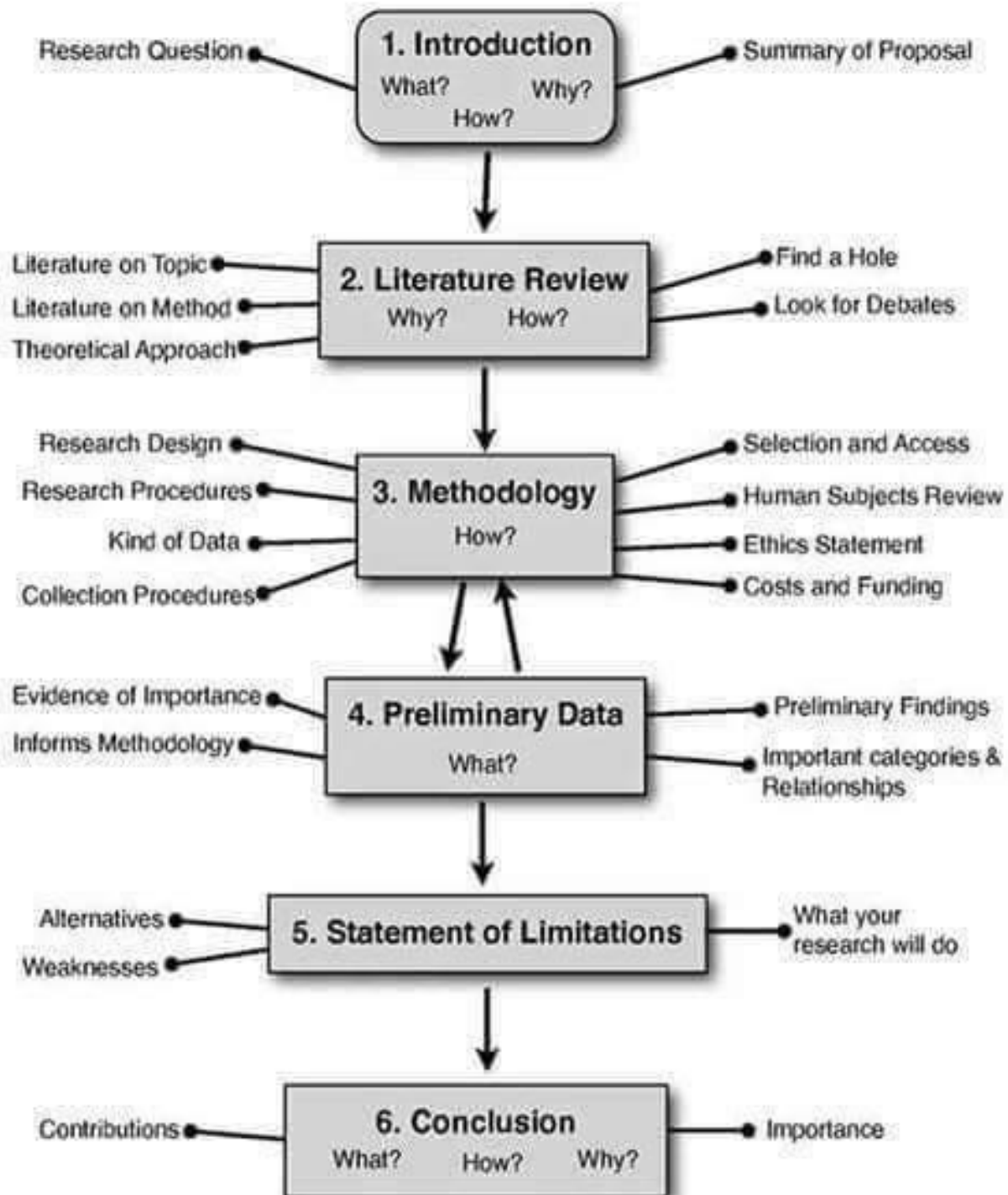
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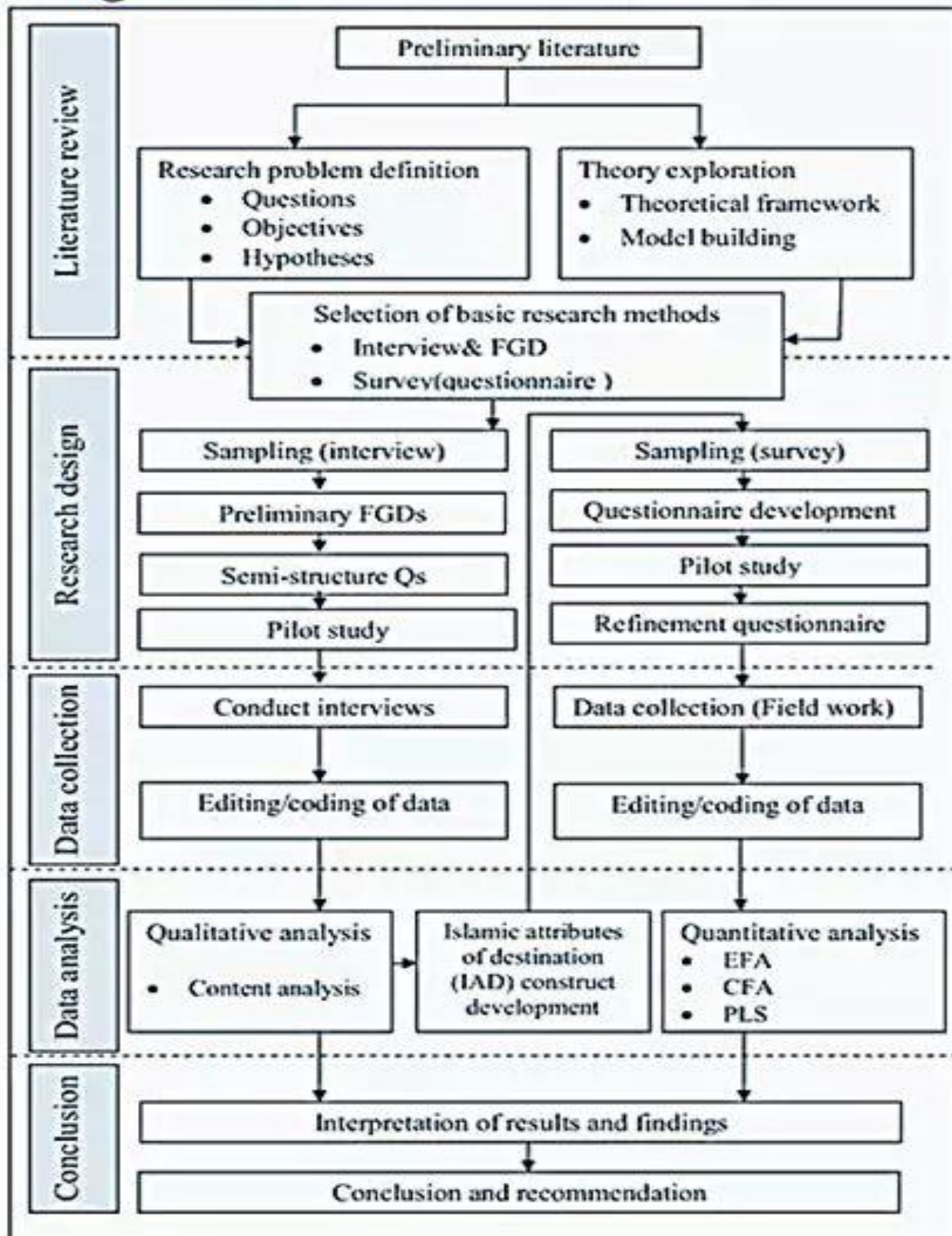
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Research Proposal Flow Chart





Literature Review Template

Definition: A literature review is an objective, critical summary of published research literature relevant to a topic under consideration for research. Its purpose is to create familiarity with current thinking and research on a particular topic, and may justify future research into a previously overlooked or understudied area.



A typical literature review consists of the following components:

1. Introduction:

- A concise **definition of a topic** under consideration (this may be a descriptive or argumentative thesis, or proposal), as well as the **scope** of the related literature being investigated. (Example: If the topic under consideration is 'women's wartime diaries', the scope of the review may be limited to published or unpublished works, works in English, works from a particular location, time period, or conflict, etc.)
- The introduction should also note intentional **exclusions**. (Example: "*This review will not explore the diaries of adolescent girls.*")
- Another purpose of the introduction is to state the **general findings** of the review (what do *most* of the sources conclude), and comment on the **availability** of sources in the subject area.

2. Main Body:

- There are a number of ways to organize the evaluation of the sources. **Chronological and thematic approaches** are each useful examples.
- Each work should be critically summarized and evaluated for its **premise, methodology, and conclusion**. It is as important to address inconsistencies, omissions, and errors, as it is to identify accuracy, depth, and relevance.
- Use logical connections and **transitions** to connect sources.

3. Conclusion

- The conclusion **summarizes the key findings** of the review in general terms. Notable commonalities between works, whether favourable or not, may be included here.
- This section is the reviewer's opportunity to **justify a research proposal**. Therefore, the idea should be clearly re-stated and supported according to the findings of the review.

4. References

- As well as accurate in-text citations, a literature review must contain **complete and correct citations for every source**.



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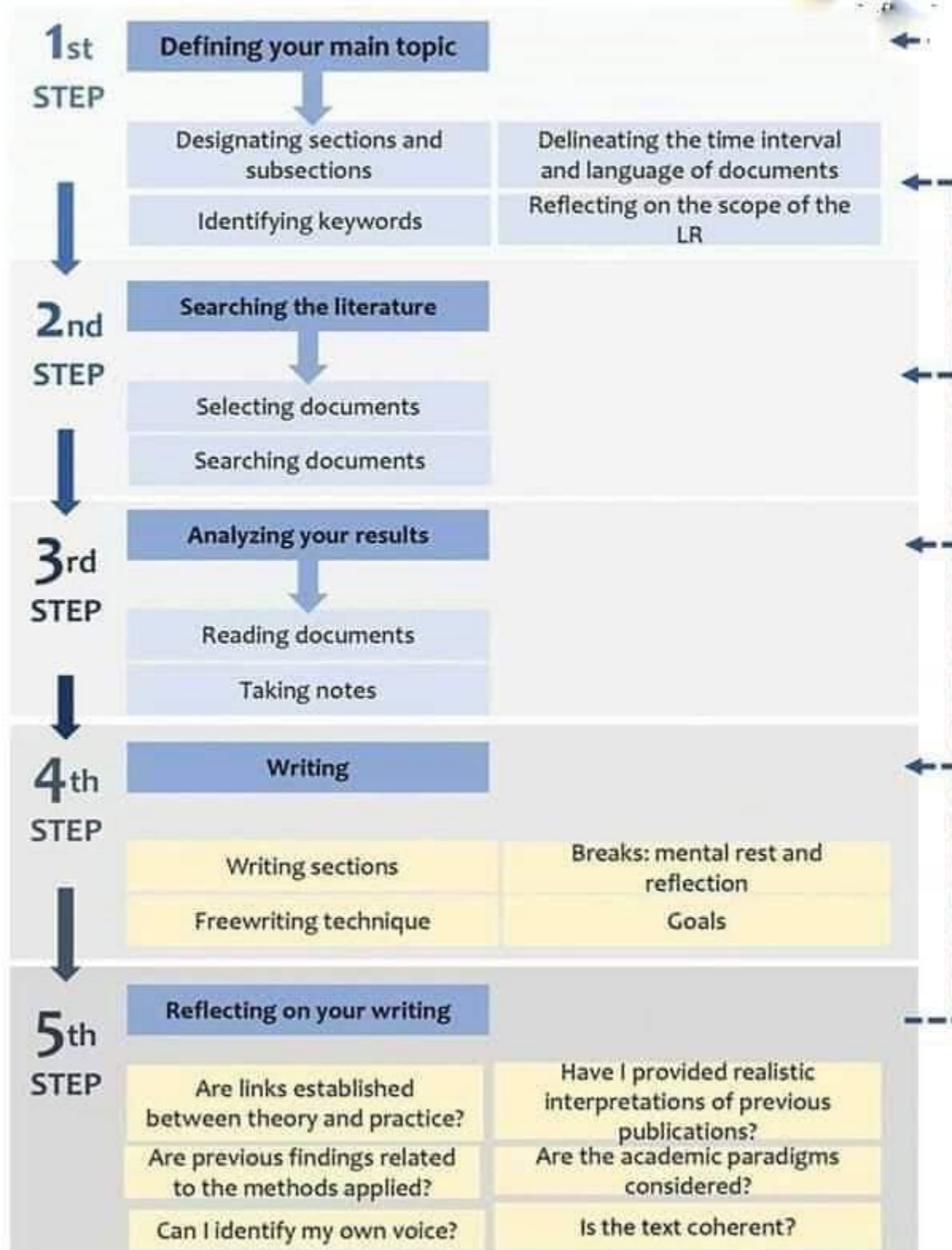


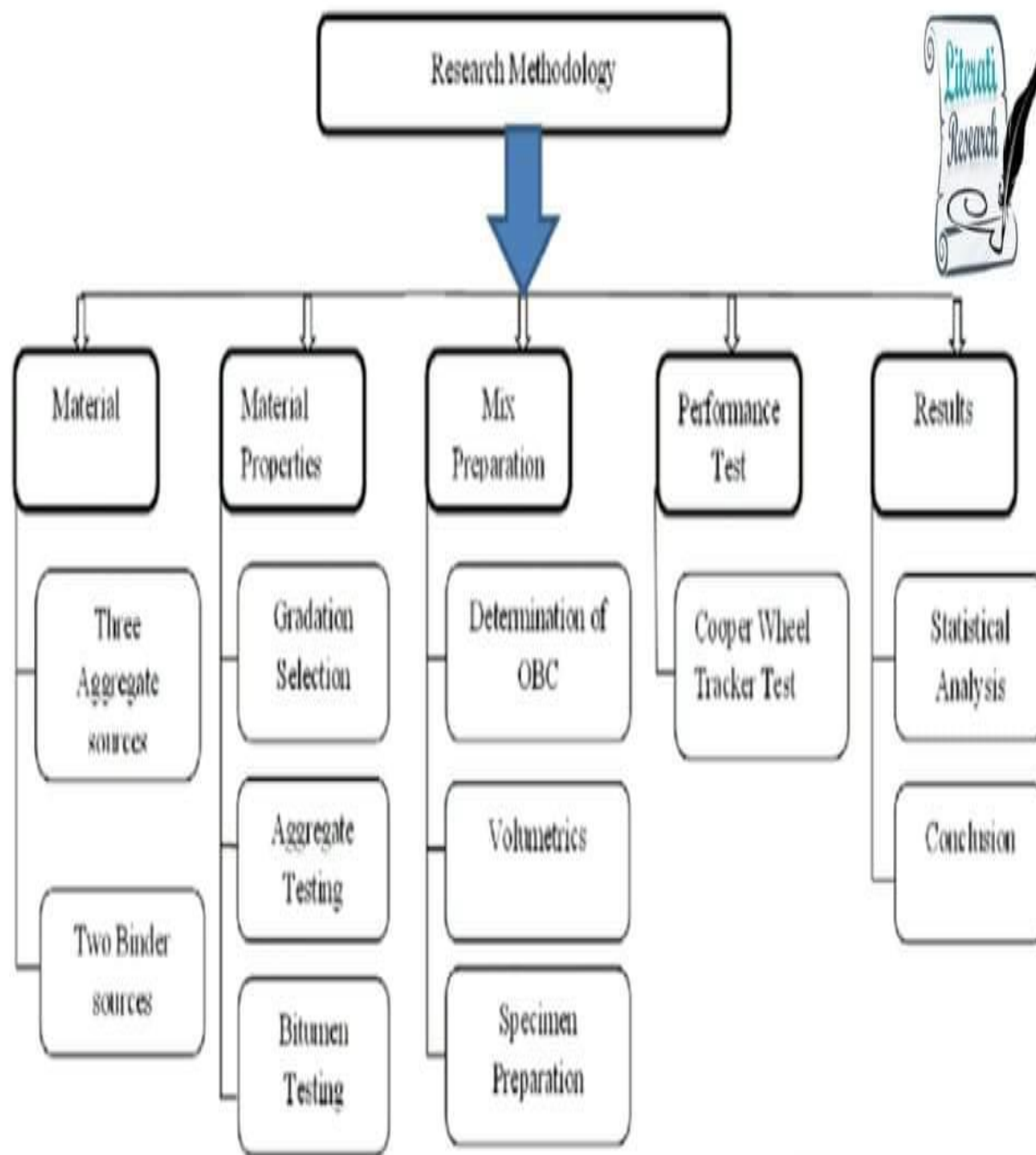
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5 –step guide on how to conduct and write a literature review





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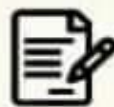





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5 DIFFERENCES BETWEEN THE RESULTS AND DISCUSSION SECTIONS

The Results and Discussion sections of your research paper play different roles. You need to understand the differences between both before you start writing them.

	<u>RESULTS SECTION</u>	<u>DISCUSSION SECTION</u>
	This section answers the question "WHAT" about your research	This section answers the question "SO WHAT" about your research
	Describes the experiments completed before the paper was written	Summarizes and interprets the significance of the main findings of your study
	States the results but does not interpret them	Interprets the results but does not restate the results
	Includes only that data which will be relevant to the discussion section	Doesn't introduce any new results in this section; so don't make statements your results can't support
	Uses the simple past tense	Uses both the past and the present tense as required



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12 IMPORTANT METHODS OF STATISTICAL DATA ANALYSIS

01	Linear Regression	Predicts a target variable by fitting the best linear relationship between the dependent and independent variable.
02	Classification	Assigns categories to a collection of data in order to aid in more accurate predictions and analysis.
03	Logistic Regression	Performed when the dependent variable is dichotomous (binary); similar to all regression analyses, this type is a predictive analysis.
04	Discriminant Analysis	Two or more groups or clusters or populations are known and one or more new observations are categorized into one of the recognized populations depending on the evaluated attributes.
05	Resampling	Drawing repeated samples from the original data samples.
06	Bootstrapping	Assists in many situations like validation of a predictive model performance, ensemble methods, estimation of bias and variance of the model.
07	Subset Selection	Identifies a subset of the p predictors that are related to the response; later fit a model through the least squares of the subset attributes.
08	Shrinkage	Suits a model involving all p predictors, however, the estimated coefficients are shrunken towards zero relative to the least squares estimates; shrinkage is also known as regularization has the outcome of reducing variance.
09	Ridge Regression	Comparable to least squares but that the coefficients are valued by minimizing a slightly different quantity.
10	Dimension reduction	Reduces the problem of estimating $p + 1$ coefficients to the simple problem of $M + 1$ coefficients, where $M < p$.
11	Nonlinear models	Observational data are modeled by a function which is a nonlinear combination of the model parameters and rest on on one or more independent variables.
12	Decision trees	Performed for both regression, classification problems; involves stratifying or segmenting the predictor space into various simple regions.



Probability vs Statistics

Which One Is Important And Why

Definition

Probability

It is the branch of mathematics and analyses the random phenomena that the event will occur. The outcome cannot be determined before the event occurs.

Statistics

Statistics is a branch of mathematics. It is used quantified models and representations for a given set of experimental data.

Examples

In the case of probability, the mathematicians would see the dice and state that "Six-sided die".

On the other hand, the statistician will assume the same dice scenario with different assumptions.

Types



Classic Probability

It is the first probability approach. In this approach, we often use the coin tossing and rolling dice.



Experimental Probability

It is different than the recent one experimental probability is based on the number of possible outcomes by the total number of trials.



Theoretical Probability

Theoretical probability is an approach that is based on the possible probability of the possible chances.



Subjective Probability

Subject probability is also known as personal probability.



Descriptive

In descriptive statistics, the statistician describes the goal. In this, we use numerical measures to tell.

Types of descriptive statistics

- ★ Central tendency measures
- ★ Variability measures



Inferential Statistics

Inferential statistics is not easy statistics. It is more complicated than descriptive statistics.

Types of Inferential statistics

- ★ Regression analysis
- ★ Analysis of variance (ANOVA)
- ★ Analysis of covariance (ANCOVA)
- ★ Statistical significance (t-test)
- ★ Correlation analysis

Models



Probabilistic Model

We use this model to incorporate the random variables and probability distributions into the model of an event or phenomenon. We know that the deterministic model provides only a single possible outcome for an event.



Statistical Model

A statistical model is a kind of mathematical model. It includes the set of statistical assumptions concerning the generation of sample data. It represents the data in an idealized form and the data-generating process.

Uses

Uses of Probability

Probability has something to do with every change you may cause. In other words, it is a study of things that something might happen or not. Probability is a crucial part of our life.

Uses of Statistics

Statistics keep us informed and alert about what is happening all around us. Statistics is a crucial part of our life because our world is full of information.



When To Use ANOVA

		Independent Variable (X)	
		Continuous	Categorical
Dependent Variable (Y)	Continuous	Regression	ANOVA
	Categorical	Logistic Regression	Chi-Square (χ^2) Test

The tool depends on the data type. ANOVA is used with an attribute (categorical) input and a continuous response.

