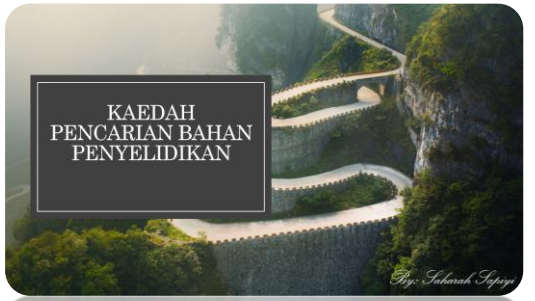
STQP6014: RESEARCH METHODOLOGY AND INDUSTRY SEMINAR

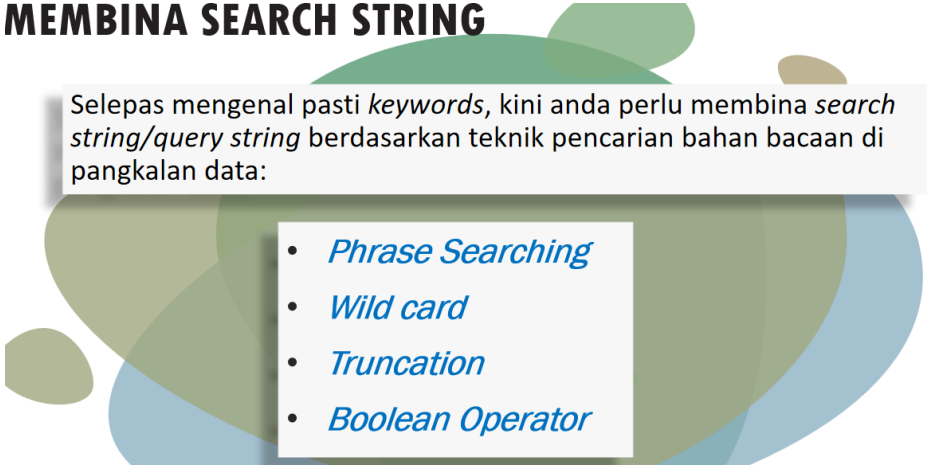
ACADEMIC WRITING: ABSTRACT, LITERATURE REVIEW

LITERATURE SEARCH

Research Materials Searching Techniques

- Refer to: PPT Slides on *Kaedah Pencarian Bahan Penyelidikan* (Research Materials Searching Techniques) oleh Dr. Saharah Sapiyi (PhD in Quality and Productivity Improvement, UKM), currently INTAN Head Centre, Communication and Language Studies.





ACADEMIC WRITING

Academic Writing defined

- https://www.scribbr.com/category/academic-writing/

- A formal style of writing used in universities and scholarly publications such text books, journal articles.
- Other examples of academic writing: essays, research papers, dissertation, thesis
- Specific conventions in terms of content, structure and style

Academic writing **is**…

- Formal and unbiased
- Clear and precise
- Focused and Well Structure
- Well Sourced
- Correct and Consistent

Academic Writing **is not**…

- Personal
- Long-winded
- Emotive and grandiose (magnificent, impressive due to absurd exaggeration)

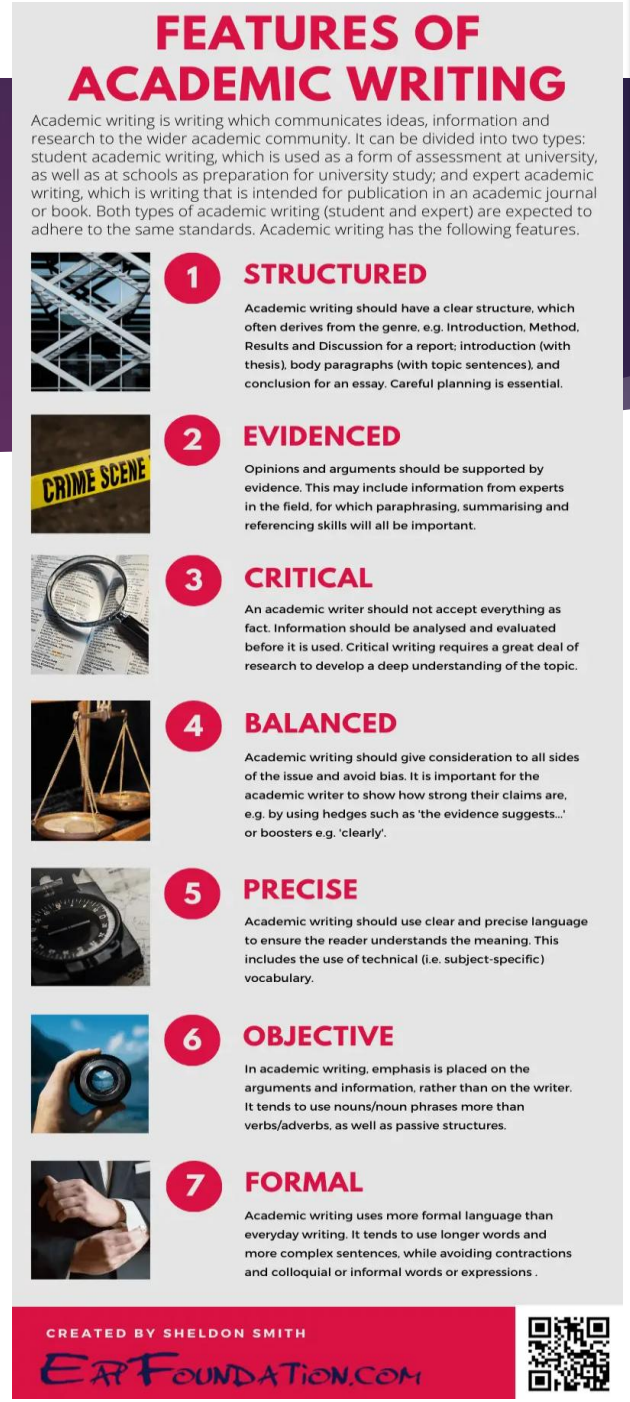
TYPE OF ACADEMIC TEXT	DEFINITION
ESSAY	A fairly short, self-contained argument, often using sources from a class in response to a question provided by an instructor
RESEARCH PAPER	A more in-depth investigation based on independent research, often in response to a question chosen by the student
THESIS/ DISSERTATION	The large final research project undertaken at the end of a degree, usually on a dissertation topic of the student's choice.
RESEARCH PROPOSAL	An outline of a potential topic and plan for a future dissertation or research project.
LITERATURE REVIEW	A critical synthesis of existing research on a topic, usually written in order to inform the approach of a new piece of research.
LAB REPORT	A write-up of the aims, methods, results, and conclusions of a lab experiment.
ANNOTATED BIBLIOGRAPHY	A list of source references with a short description or evaluation of each source.

Formal and Unbiased

- Convey information in an impartial way
- base arguments on the evidence under consideration, not the author's preconceptions
- All claims should be supported with relevant evidence, not just asserted.
- clearly outlining your methodology and being honest about the limitations of your research

Features of Academic Writing

- https://www.eapfoundation.com/writing/what/



SPAM

A STRUCTURED APPROACH FOR WRITING & PUBLISHING SCIENTIFIC PAPERS

WHAT IS IN A PAPER?

A paper is a report about;

- The System under study
- The Problems to be solved
- The Achievements in solving the problems
- The Methods used to achieve them

It's all about **S P A M**

ABSTRACT

- An abstract is a concise summary of a research study, including its purpose, methods, results, and conclusions.

CHARACTERISTICS OF A GOOD ABSTRACT

- **Concise** (usually 150–250 words)
- **Complete** (contains key elements of the research)
- **Clear** (easily understood, no jargon)
- **Structured** (logically organized)

COMMON ABSTRACT STRUCTURE

A. IMRaD Structure (for empirical research)

1. **Introduction** – What is the research about?
2. **Methods** – How was the research conducted?
3. **Results** – What did you find?
4. **Discussion/Conclusion** – What does it mean?

STRUCTURED ABSTRACT

Section	Description
Background	The problem or motivation
Objectives	What the research aimed to do
Methods	The approach, model, dataset, or algorithm used
Results	Main findings (e.g., accuracy, patterns, trends)
Conclusion	Implication, significance, or next steps

EXAMPLE OF A WELL-WRITTEN ABSTRACT

Title: *Predicting Student Performance Using Machine Learning: A Comparative Study*

- **Abstract:**
  This study investigates the effectiveness of various machine learning algorithms in predicting academic performance among university students. The objective is to identify the most accurate and interpretable model for early intervention. A dataset comprising 1,000 student records, including demographic, behavioral, and academic variables, was analyzed using Random Forest, Support Vector Machine, and Logistic Regression. The Random Forest model achieved the highest accuracy (87%) and offered key insights into feature importance. The findings suggest that timely identification of at-risk students can support targeted educational strategies. Future work will explore real-time data integration and broader institutional applications.

COMMON MISTAKES TO AVOID

- Being too vague or general
- Including citations or references
- Writing too much background
- Omitting key results
- Using acronyms without definition

LITERATURE REVIEW

Critical Review

- Evaluates strengths and weaknesses
- Assesses methodological rigor and relevance
- Reflects on the implications and limitations
- Considers the paper’s contribution to the field

Review Framework using 5C model

Aspect	Questions to Ask
Context	What is the research problem? Why is it important?
Content	What are the key findings or arguments?
Credibility	Is the methodology appropriate and well-executed?
Contribution	How does it advance knowledge or practice?
Critique	What are the limitations, biases, or gaps?

EXERCISE

Choose a paper

- Read the paper thoroughly
- Highlight key parts (objective, methods, results, discussion)
- Use the framework above to structure their notesWrite a short review (300–500 words)

Example Critical Review

- Paper entitled:

A Comparison of Machine Learning Algorithms for Predicting Customer Churn"

Example: Critical Review

Summary:

This study compares four machine learning models—Logistic Regression, Decision Tree, Random Forest, and XGBoost—using a public telecommunications dataset to predict customer churn.

Critical Review:

This paper tackles a relevant and practical issue—predicting customer churn—with real business value. The study is well-structured and compares multiple algorithms using appropriate metrics (accuracy, precision, recall, F1-score). A strength of the paper is the inclusion of feature importance, which enhances interpretability, especially with Random Forest and XGBoost.

However, the paper lacks clarity on hyperparameter tuning, which may affect model performance. The dataset used is slightly outdated and lacks recent behavioral variables, such as app usage or customer feedback scores. Moreover, the paper does not explore ethical implications or model biases (e.g., fairness across customer segments), which are critical in applied data science.

- Overall, while the paper demonstrates sound technical execution, it would benefit from a more holistic approach, including business context, ethics, and limitations.

THANK YOU