

Fundamentals of Data Visualization and Effective Reporting

Objective	The main goal of this group project is for students to be able to communicate an explanatory analysis with an appropriate report.
Briefing:	• Form a group of three (max: 4) members and work on a project that applies data visualization techniques. • Students may choose any hands-on tools (Google Spreadsheet or Power BI) to perform the data visualization. • The data source must be primary data. • The objective(s) of this project must be clearly defined and measurable (up to 2 main goals only). Example: • Objective 1: <i>To describe the demographic profile of the respondents</i> • Objective 2: <i>To analyze anonymized student performance data (e.g., exam scores, attendance, GPA)</i> <i>Both of the objectives can be achieved using tables or simple plots.</i> • The results (analysis/visualization) section should include relevant tables and simple charts to support the objectives.
Content	Title, Abstract, Introduction, Methodology, Results, Conclusion, Reference (at least 3 sources, max 5 sources), and Appendices (if any).
Format	Students are required to refer to and follow the prescribed template. Single spacing and do not exceed 10 pages.

Recommendations for Content Detailing

Title

Good research paper titles (typically 10–12 words long) use descriptive terms and phrases that accurately highlight the core content of the paper.

- Concise, accurate, meaningful, and highlight the significant issue.
- Interesting and attract attention.
- Different from the others.
- Avoid abbreviations.
- Not too short but not too long - 10–12 words.
- The title should contain: What is my paper about? What techniques/ designs were used? Who/what is studied?

Abstract

How to write an abstract?

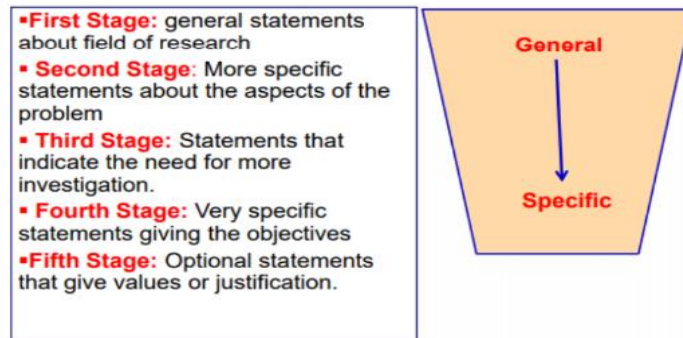
- Begin writing the abstract after we have finished writing the full content.
- First, answer the questions "What problem are we trying to solve?" and "What motivated us to do so?" by picking out the major objectives/hypotheses and conclusions from our Introduction and Conclusion sections.
- Next, answer the question, "How did we go about achieving your objective?" by selecting key sentences and phrases from our Methods section.
- Now, reveal our findings by listing the major results from the Results section.
- Finally, answer the question, "What are the implications of our findings?"
- Arrange the sentences and phrases selected in steps 2, 3, 4, and 5 into a single paragraph in the following sequence: Introduction, Methods, Results, and Conclusions (IMRaD).
- Make sure that the abstract is self-contained and does not include Information that is not present in the paper, figures and tables, Abbreviations, Literature reviews or references and citations
- An abstract is written in the past tense
- Check that the information flows well, preferably in the following order: purpose, basic study design/techniques, major findings, conclusions, and implications.

Introduction

The introduction is a very important section where it serves as an orientation for readers, giving them the following:

- perspective they need to understand the detailed information coming in later sections.
- Contains a review of up-to-date literature.
- Discuss the objective(s) and significance of the work.
- Include at least (3 citation), max 5 citation

How to write an introduction?



In Stage 3, it is very important to highlight the need for more investigation (as a study gap). We need to do a literature review to establish the knowledge gap.

Statements that indicate the need for more investigation - **Missing Information/Gap of Knowledge**

- However, **few studies have reported** on the effects of computer assisted instruction.
- But **there is little information available** on the air flow rates on simple flat plate solar collectors.

Example of writing introduction:

if we can Identify and distinguish the five stages of the introduction flow as below, then, we are good to go

During the past 40 years, the United States has experienced the integration of the computer into society. Progress has been made to the point that small, inexpensive computers with expanded capabilities are available for innumerable uses. Many schools have purchased and are purchasing microcomputers for infusion into their directed learning programs.

Most individuals seem to agree that the microcomputer will continue to hold an important role in education. Gubser (1980) and Hinton (1980) suggested phenomenal increases in the numbers of computers both in the school and the home in the near future. Schmidt (1982) identified three types of microcomputer use in classrooms: the object of a course, a support tool, and a means of providing instruction. Foster and Kleene (1982) cite four uses of microcomputers in vocational agriculture: drill and practice, tutorial, simulation and problem solving.

The findings of studies examining the use of various forms of computer-assisted instruction (CAI) have been mixed. Studies by Hickey (1968) and Honeycutt (1974) indicated superior results with CAI while studies by Ellis (1978), Coldwell (1980) and Belzer (1976) indicated little or no significant effect. Although much work has been done to date, more studies need to be conducted to ascertain the effects of microcomputer-assisted instruction in teaching various subjects in a variety of learning situations.

The purpose of this study was to ascertain the effect of using microcomputer-assisted instruction as compared to a lecture-discussion techniques in teaching principles and methods of cost recovery and investment credit on agricultural assets to graduate students in agricultural education. This topic was identified as being of importance to teachers in providing them the necessary background to teach lessons in farm records .

Methodology

Must be written in the past tense and in a passive voice and contain this sub-section:

- Simple Research design
- Reference population, Target sample and Sampling techniques (if using primary data)
- Instrumentation: The Questionnaire.
- Statistical Analysis: Students should use a suitable data visualization to achieve the objectives. What and why?

Result

This section is the most important part in which a critical analysis of the results is done. This section should contain a presentation of the results of the analysis, tables, graphs, figures, dashboard and etc.

- Provide a Sufficient good quality number of Figures or Tables to present the result.
- The tables and figures should be complementary, not repeat the same information.
- Every table or figure should be referred to in the text. Any table or figure not referred to should be removed.
- Do not copy and paste the output from the software. Summarizes your results in the text, drawing on the figures or tables to illustrate your points.
- Explain possible reasons for the results.

Conclusion

A reference to the main purpose of the study (make it in 1 paragraph only). Students should conclude the findings and make some recommendations.

- A review of the most important findings. It should reinforce the originality and the significance of the work presented.
- Should be consistent with the objectives – highlight the achievements.
- Refers to only work done in the present study
- Discuss the applications and future experiments.
- Highlight the limitations of the study

Reference

- At least 3 references, max 5 references
- APA 7th Edition style