Scientific writing (Rédaction scientifique)

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2024

Domaine: Mathematics and Computer Science
Title of the ACADEMIC LICENSE: Computer Science
Speciality: Informatic Systems
Semestre: S6
Methodology teaching unit: UEF2
Title of the material: Scientific Writing (Rédaction scientifique).
Credits: 2
Coefficients: 1
Objectives of teaching: Applies the techniques of design for the study. How to publish the results of their research work.
Recommended prior knowledge: knowledge of scientific work.
Content of the material:

1. **Chapter I:** Before writing.
   (a) Organization of ideas and writing plan
   (b) Prepare how to write
   (c) Choose your formatting tools
   (d) Version control systems
2. **Chapter II:** Bibliographic references.
   (a) Obtain references
   (b) Building the bibliography
   (c) Avoid plagiarism
3. **Chapter III:** Writing
   (a) Structure
   (b) Content
   (c) Style
   (d) Presentation

Evaluation method: Exan (100%).

The author has prepared this work by collecting a wide range of different scientific sources for educational purposes. The use of these courses is authorized as part of university training with mention of the author.

Rferences

- Mélot, Hadrien. "Eléments de rédaction scientifique en informatique." (2008).
- Valduriez, Patrick, Projet Rodin, and France Patrick. "Some Hints to Improve Writing of Technical Papers." Ingénierie des Systemes d'Informations 2, no. 3 (1994): 371-375.

Contents

Introduction

Scientific writing is a specialized form of communication that aims to convey research findings, theories, and methodologies to a targeted audience. It follows a specific format with key sections, including an introduction, methods, results, and discussion. The introduction serves as the opening section of a scientific paper, providing background information, outlining the purpose of the study, and establishing the context for the research. It familiarizes readers with the issue at hand and justifies why it's important to address. Clear and concise writing is crucial in scientific communication, ensuring that complex ideas are effectively conveyed. Adherence to a structured writing style, with topic sentences and appropriate transitions between paragraphs, enhances clarity and readability.

Scientific writing is not an easy thing. The main difficulties are: having a good knowledge of the language, having writing experience, knowing the basic principles of "good" writing and having an effective working method. Knowledge of the language and experience are not the subject of this note, because it is up to the student himself to perfect them.

On the other hand, the objective here is to help the student to appropriate elements allowing him to improve his writing and to build an effective working method.

Chapter 1

Before writing

(a) Organization of ideas and writing plan

(b) Prepare how to write

(c) Choose your formatting tools

(d) Version control systems

Introduction

Before delving into the writing phase of scientific production, researchers engage in a meticulous pre-writing process to ensure clarity, coherence, and effectiveness in communicating their findings. This crucial stage involves several key steps, including defining the research question or objective, conducting thorough literature reviews to understand existing knowledge gaps, outlining the structure of the manuscript, and gathering and organizing data. Additionally, researchers may refine their hypotheses, methods, and analytical approaches during this phase to align them with the research goals. The pre-writing process lays the foundation for a successful scientific manuscript, providing a roadmap for the writing phase and facilitating the synthesis of complex information into a cohesive narrative.

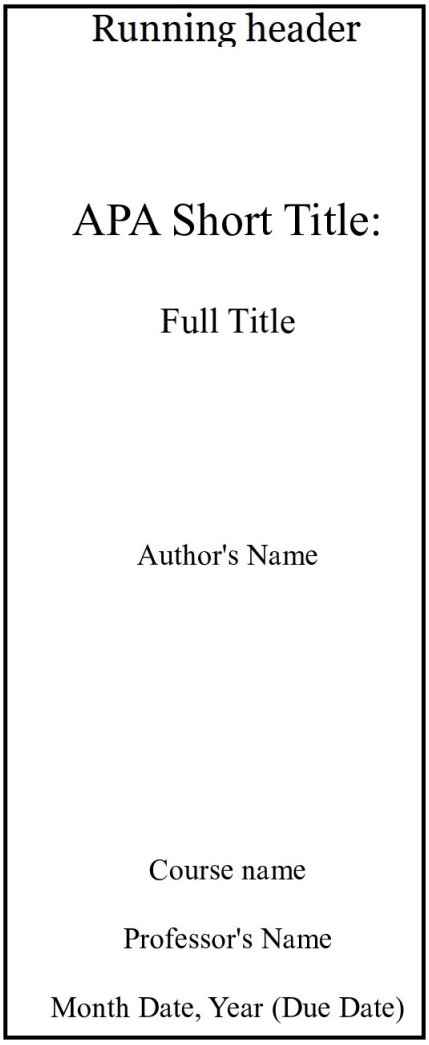
1.1 Organization of ideas and writing plan

Effective organization of ideas is essential for coherent and compelling scientific writing. Before beginning to write, it's crucial to plan and structure the content. Here's a concise plan for organizing ideas and creating a writing plan:

1.1.1 Cover and cover page

A cover page is a separate page at the beginning of a document that displays essential information about the document, such as its title, author, date, and any other pertinent details. It serves as the introductory page and often includes graphic elements or design features to make it visually appealing. Cover pages are commonly used in reports, essays, proposals, and other formal documents to provide a professional and organized appearance. They help to introduce the content of the document and provide important context for the reader before delving into the main body of the text. the content to include in a successful cover page:

- **Running header:** A running header is a text usually placed at the top of a cover page. The maximum number of characters used for the running head is 50 characters and it's best written in uppercase.
- **Title:** It is important as it explains the content of the work done to your readers. When drafting your title, try to write all words in full and avoid using abbreviations and contractions.
- **The name of the institution or university:** When working on an academic paper or project, your university or institution is another important piece of information for your cover page.
- **The name of the author:** An essay written by several students



will begin with a list of the students with their affiliations and the name of the author placed beneath the title cover page.

- **The date:** It should be the exact date of publication. Another benefit of including a date on a cover page is to provide correct information about the work for future reference, in case someone wanted to search for works in a specific frame of time.

1.1.2 Acknowledgments

Acknowledgements are usually a minor part of scientific papers, but they serve a very important function. This section of the manuscript is normally reserved to thank those who offered assistance, but not enough to merit authorship, funders, or any other people or organizations or artificial intelligent tools that may have in any way been directly associated either with the research reported in that study, or with the published paper.

1.1.3 Table of contents

Documents longer than ten pages use a table of contents to help the reader move around in the material. Tables of contents are widely used in reports, proposals, and other longer administrative and research documents. They are not used in articles that appear in periodicals. A table of contents is a list of the main subject headings and subheadings of the document. Hence, a table of contents not only helps readers find materials in the report but also outlines the topics of the report.

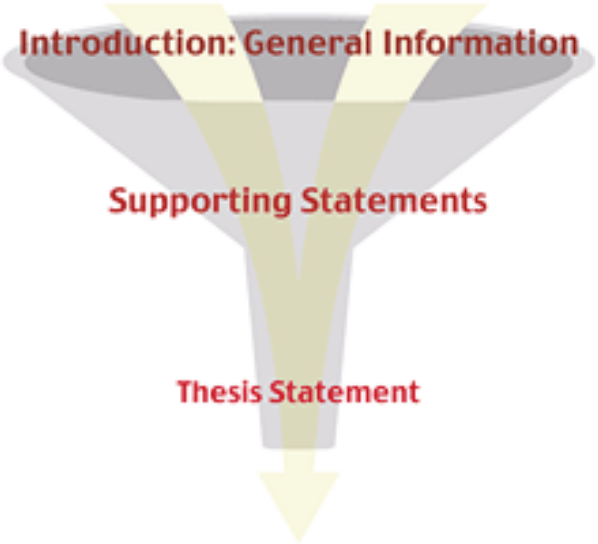
1.1.4 Introduction

An introduction in scientific writing serves to provide context, background, and self-introduction. It is crucial to write this section clearly and effectively, as it sets the tone for the entire paper. A good introduction will capture the reader's attention and interest. In research writing, it is essential to provide a brief overview of the research question, methodology, and significance of the study. The introduction should end with a thesis statement that outlines the main objectives of the paper.

1.1.5 Chapters or Sections

Scientific writing has many similarities and differences to standard writing. A standard template guides the overall design: (introductory paragraph with thesis statement, main body of paragraphs, conclusion paragraph) and the construction of each paragraph (topic sentence, supporting sentences, concluding sentence). The flow of the writing should go from broad to narrow (thesis statement) through the main body and from narrow to broad in the conclusion.

However, in scientific writing, the economy of words guides the word count. It is always best to express the most ideas in the most direct way, using the least number of words.



1.1.6 Conclusion

A conclusion is a statement based on experimental measurements and observations. It includes a summary of the results, whether or not the hypothesis was supported, the significance of the study, and future research.

1.1.7 Bibliography

A bibliography is a list of sources cited in a piece of academic writing. In scientific writing, a bibliography is typically required to provide evidence for claims made in the paper. The format of a bibliography can vary depending on the citation style used, but it typically includes the author's name, the title of the work, the date it was published, and other relevant information.

1.1.8 Appendices

An appendix comes at the end (after the reference list) of a report, research project, or dissertation and contains any additional information, such as raw data or interview transcripts. The information in the appendices is relevant, but too long or too detailed to include in the main body of your work.

1.2 Prepare how to write

Preparing to write a scientific paper involves several key steps. Here's a structured guide to help you:

(a) **Understand the Structure:** Familiarize yourself with the standard structure of scientific papers, typically including sections like Introduction, Methods, Results, Discussion (IMRAD), and Conclusion.

(b) **Choose a Topic:** Select a topic that interests you and is relevant to your field of study. Ensure it's not too broad or too narrow.

(c) **Review Existing Literature:** Conduct a thorough literature review to understand the current state of research on your topic. Identify gaps in knowledge that your paper can address.

(d) **Define Your Hypothesis or Research Question:** Clearly articulate the main hypothesis or research question that your study aims to address. This will guide your research and writing.

(e) **Design Your Study:** Plan and execute your research methodology carefully. Document all procedures and materials used to ensure reproducibility.

(f) **Collect and Analyze Data:** Gather data following your research design. Employ appropriate statistical or analytical methods to analyze your data.

(g) **Organize Your Findings:** Present your results in a clear and logical manner. Use tables, figures, and graphs to enhance clarity and understanding.

(h) **Interpret Your Results:** Discuss the implications of your findings in the context of existing literature. Address any unexpected results and potential limitations of your study.

(i) **Write the Draft:** Start with the sections you feel most comfortable with. Follow the IMRAD structure, ensuring each section flows logically and supports your main argument.

(j) **Cite Sources Properly:** Use appropriate citation styles (e.g., APA, MLA, Chicago) to credit the sources of your information and ideas. Ensure accuracy and consistency.

(k) **Revise and Edit:** Review your draft critically for clarity, coherence, and accuracy. Make revisions as needed to improve the quality of your paper.

(l) **Get Feedback:** Seek feedback from peers, mentors, or colleagues in your field. Incorporate their suggestions to strengthen your paper.

(m) **Finalize Your Paper:** Make final edits and proofread your paper for grammar, spelling, and formatting errors. Ensure compliance with journal guidelines if submitting for publication.

1.3 Choose your formatting tools

There are several popular options that researchers and academics commonly use. Here are a few:

(a) **LaTeX:** LaTeXis a typesetting system commonly used for technical and scientific documents. It's particularly popular in academia for its ability to produce high-quality documents with complex mathematical equations and symbols.

(b) **Overleaf:** Overleaf [1] is an online LaTeXeditor that allows collaborative writing and real-time collaboration. It provides templates and tools specifically designed for scientific writing, making it easier for researchers to create and format their documents.

(c) **Markdown:** Markdown [2] is a lightweight markup language that is becoming increasingly popular for writing scientific documents. With the help of tools like Pandoc, Markdown can be converted into various formats including LaTeX, PDF, and HTML.

(d) **Scrivener:** Scrivener [3] is a writing tool that is often favored by researchers and academics for its organizational features. While not specifically designed for scientific writing, its ability to manage large documents, references.

(e) **LibreOffice/OpenOffice:** [4] These open-source office suites offer alternatives to Microsoft Word. It can be used effectively with plugins like **Zotero** for citation management.

Choosing the right tool often depends on personal preference, the specific requirements of the project, and the collaborative nature of the work. Many researchers use a combination of these tools depending on the stage of the writing process and the preferences of collaborators.

[1] `https://fr.overleaf.com/project`
[2] `https://daringfireball.net/projects/markdown/`
[3] `https://www.literatureandlatte.com/scrivener/overview`
[4] `https://fr.libreoffice.org/download/telecharger-libreoffice/`

1.4 Version control systems

Version control systems (VCS) are tools that allow programmers to manage changes to their code over time. This helps to keep track of different versions of a project and roll back changes if necessary. These systems use a branching model to allow for parallel development work, and they often include features such as conflict resolution and merge support. Here are some popular version control systems:

(a) **Git:** [5] Developed by Linus Torvalds, Git is one of the most widely used distributed version control systems. It's known for its speed, efficiency, and robust branching and merging capabilities.

(b) **Subversion (SVN):** SVN [6] is a centralized version control system that maintains a single repository for the project. It's been around for a long time and is still used in many organizations, although it's been largely supplanted by distributed systems like Git.

(c) **Mercurial (Hg):** [7] Similar to Git, Mercurial is another distributed version control system. It's designed to be easy to use and has gained popularity for its simplicity and performance.

(d) **Perforce:** Perforce [8] is a centralized version control system commonly used in enterprise environments, especially in industries like gaming and software development where large binary assets are common.

(e) **Microsoft Team Foundation Version Control:** TFVC [9] is a centralized version control system offered by Microsoft as part of its Azure DevOps suite. It's commonly used alongside Git within the Azure DevOps ecosystem.

[5] `https://git-scm.com/`
[6] `https://subversion.apache.org/`
[7] `https://www.mercurial-scm.org/`
[8] `https://www.perforce.com/manuals/dvcs/Content/DVCS/Home-dvcs.html`
[9] `https://azure.microsoft.com/en-us/products/devops/server/`

Chapter 2

Bibliographic references

(a) Obtain references

(b) Building the bibliography

(c) Avoid plagiarism

Introduction

The bibliography is a fundamental element of scientific and technical work. The base of the scientific approach is to rely on existing work to propose personal contributions. The text and bibliographical references must allow the reader to differentiate between what is personal and what is not. Bibliographic references must be complete so that they can be found without ambiguity.

2.1 Obtain references

In scientific writing, references are crucial for acknowledging sources and supporting claims. The structured approach to obtaining references is:

(a) **Identify Relevant Sources:** Determine the sources that are pertinent to your topic. These can include peer-reviewed journal articles, books, conference proceedings, government reports, and reputable websites.

(b) **Use Academic Databases:** Before going to the library, see if it is available in electronic format via sites like:

- Citeseer (`citeseer.ist.psu.edu`),
- Google Scholar (`scholar.google.com`),
- ScienceDirect (`www.sciencedirect.com`),
- ACM Digital Library (`portal.acm.org`),
- IEEE Digital Library (`www.computer.org/portal/site/csdl/index.jsp`).

The first two sites often provide access to preprints. The ScienceDirect site provides access to the content of hundreds of scientific journals, but you must connect to it from the university to access it.

The ACM and IEEE electronic libraries contain a significant number of computer science publications. You need to have an account to log in. Other computer resources are given on the website of the Library of Sciences and Medicine.

(c) **Cite Properly:** Ensure that you follow the appropriate citation style guidelines (e.g., APA, MLA, Chicago) when citing references in your scientific writing. Include all necessary bibliographic information such as author(s), title, publication year, journal or book title, volume, issue, page numbers, and DOI (if available).

(d) **Organize References:** Keep track of your references using reference management software like Zotero, Mendeley, or EndNote. These tools can help you organize, cite, and manage your references efficiently.

(e) **Avoid Plagiarism:** Always provide proper attribution when using ideas, data, or words from other sources to avoid plagiarism. Paraphrase or quote directly from the original source and cite it accordingly.

2.2 Building the bibliography

The bibliographic information for different types of resources is located in different places, so you may need to do some detective work to get all the information for your bibliography:

- The title page of a book, encyclopedia or dictionary
- The heading of an article
- The front, second, or editorial page of the newspaper
- The contents page of a journal or magazine
- The header (at the top) or footer (at the bottom) of a Web site
- The About or the Contact page of a Web site

There are standards for documenting sources of information in research papers. Even though different journals may use a slightly different format for the bibliography, they all contain the same basic information. The most basic information that each reference should have is the author's name, the title, the date, and the source.

2.2.1 Bibliography styles

Different types of sources have different formatting in the bibliography. In American schools, the two most commonly used guidelines for this formatting are published by the MLA (Modern Language Association) and the APA (American Psychological Association).

The MLA guidelines call for the bibliography to be called Works Cited. Science Buddies has summarized some of the most common MLA formats for your use: MLA Format Examples.

The APA guidelines call for the bibliography to be called the Reference List. Science Buddies has summarized some of the most common APA formats for your use.

2.2.2 Sample Bibliographies

APA Reference List Format:

Telli, A., Benferhat, S., Bourahla, M., Bouraoui, Z., & Tabia, K. (2017). Polynomial algorithms for computing a single preferred assertional-based repair. KI-Künstliche Intelligenz, 31, 15-30.

MLA Reference List Format:

Telli, Abdelmoutia, et al. "Polynomial algorithms for computing a single preferred assertional-based repair." KI-Künstliche Intelligenz 31 (2017): 15-30.

Chicago Reference List Format:

Telli, Abdelmoutia, Salem Benferhat, Mustapha Bourahla, Zied Bouraoui, and Karim Tabia. "Polynomial algorithms for computing a single preferred assertional-based repair." KI-Künstliche Intelligenz 31 (2017): 15-30.

Harvard Reference List Format:

Telli, A., Benferhat, S., Bourahla, M., Bouraoui, Z. and Tabia, K., 2017. Polynomial algorithms for computing a single preferred assertional-based repair. KI-Künstliche Intelligenz, 31, pp.15-30.

Vancouver Reference List Format:

Telli A, Benferhat S, Bourahla M, Bouraoui Z, Tabia K. Polynomial algorithms for computing a single preferred assertional-based repair. KI-Künstliche Intelligenz. 2017 Mar;31:15-30.

TeX Reference List Format:

article { telli2017polynomial,
title={ Polynomial algorithms for computing a single preferred assertional-based repair },
author={Telli, Abdelmoutia and Benferhat, Salem and Bourahla, Mustapha and Bouraoui, Zied and Tabia, Karim},
journal= { KI-Künstliche Intelligenz},
volume={31}, pages={15–30}, year={2017}, publisher={Springer} }

EndNote Reference List Format:

%0 Journal Article
%T Polynomial algorithms for computing a single preferred assertional-based repair
%A Telli, Abdelmoutia
%A Benferhat, Salem
%A Bourahla, Mustapha
%A Bouraoui, Zied
%A Tabia, Karim
%J KI-Künstliche Intelligenz
%V 31
%P 15-30
% 0933-1875
%D 2017 %I Springer

2.3 Avoid plagiarism

Plagiarism is the unethical practice of using words or ideas (either planned or accidental) of another author/researcher or your own previous works without proper acknowledgment. Considered a serious academic and intellectual offense, plagiarism can result in highly negative consequences, such as paper retractions and a loss of author credibility and reputation. It is currently a grave problem in academic publishing and a major reason for paper retractions.

2.3.1 Types of plagiarism

Plagiarism can take various forms, ranging from intentional to unintentional. here are some common types of plagiarism:

(a) **Direct Plagiarism:** This involves copying someone else's work word-for-word without giving proper credit or citation.

(b) **Self-Plagiarism:** Also known as "recycling fraud," this occurs when a person submits their own previously written work as new, without proper citation or acknowledgment.

(c) **Mosaic Plagiarism:** Sometimes called "patchwriting," this involves copying and pasting from multiple sources, combining them without proper citation, and presenting them as original work.

(d) **Paraphrasing Plagiarism:** Paraphrasing involves rewriting someone else's work in your own words. However, if proper citation is not provided or if the structure and ideas closely resemble the original, it can still be considered plagiarism.

(e) **Accidental Plagiarism:** This occurs when a person unintentionally plagiarizes someone else's work due to improper citation practices, lack of understanding of citation rules, or failure to distinguish between their own ideas and those of others.

(f) **Uncredited Quotation:** Failing to properly attribute a direct quote to its original author is also a form of plagiarism.

(g) **Fabrication:** Creating false information and attributing it to a source or presenting entirely fabricated content as genuine is also a form of academic dishonesty and plagiarism.

2.3.2 Ways to avoid plagiarism

Avoiding plagiarism in scientific writing is essential to maintaining academic integrity and ensure the credibility of your work:

- **Cite your source:** Whenever you use someone else's ideas, words, or work, ensure that you provide proper citation according to the required citation style (e.g., APA, MLA, Chicago). This includes both in-text citations and a complete bibliography or reference list.
- **Include quotations:** When directly quoting a source, use quotation marks to indicate the exact words of the author. Also, provide a citation to give credit to the original source.
- **Paraphrase:** Paraphrasing is rewriting a source's ideas or information into your own words, without changing its meaning. But be careful paraphrasing can slip into plagiarism if done incorrectly.
- **Present your own idea:** Whenever possible, strive to develop and express your own ideas and arguments. Even when discussing existing research, provide your own analysis and interpretation.
- **Summarizing:** on the other hand, involves condensing the main ideas or key points of a source into a shorter form. It involves providing an overview of the most important information while omitting less significant details. Summaries are often used to provide a brief overview of a larger text or to highlight the main points for the reader.

- **Use a plagiarism checker:** Utilize plagiarism detection tools and software to check your work for any unintentional plagiarism. These tools can help identify passages that may need to be properly cited or rephrased.
- **Review and Edit Your Work:** Before submitting your work, carefully review it to ensure that all sources are properly cited and attributed. Use plagiarism detection software or online tools to check your document for unintentional plagiarism.

2.3.3 Plagiarism detection tools

Turnitin [1]**:** A widely used plagiarism detection tool for academic institutions.

Grammarly[2]**:** While primarily known as a grammar checking tool, Grammarly also offers plagiarism detection features in its premium version.

Copyscape[3]**:** Copyscape is a web-based plagiarism detection tool that allows users to check for copies of their content online. Website: Copyscape

Plagiarism Checker X[4]**:** This software is designed for individuals, teachers, students, and website owners to check for plagiarism in documents, assignments, and web content.

Quetext[5]**:** Quetext offers a user-friendly plagiarism detection tool that checks for plagiarism in documents and web content.

Plagscan[6]**:** Plagscan offers plagiarism detection solutions for academic institutions, businesses, and individuals.

[1] https://www.turnitin.com/
[2] https://www.grammarly.com/
[3] https://www.copyscape.com/
[4] https://plagiarismcheckerx.com/
[5] https://www.quetext.com/
[6] https://www.plagscan.com/en/

Chapter 3

Writing

(a) Structure

(b) Content

(c) Style

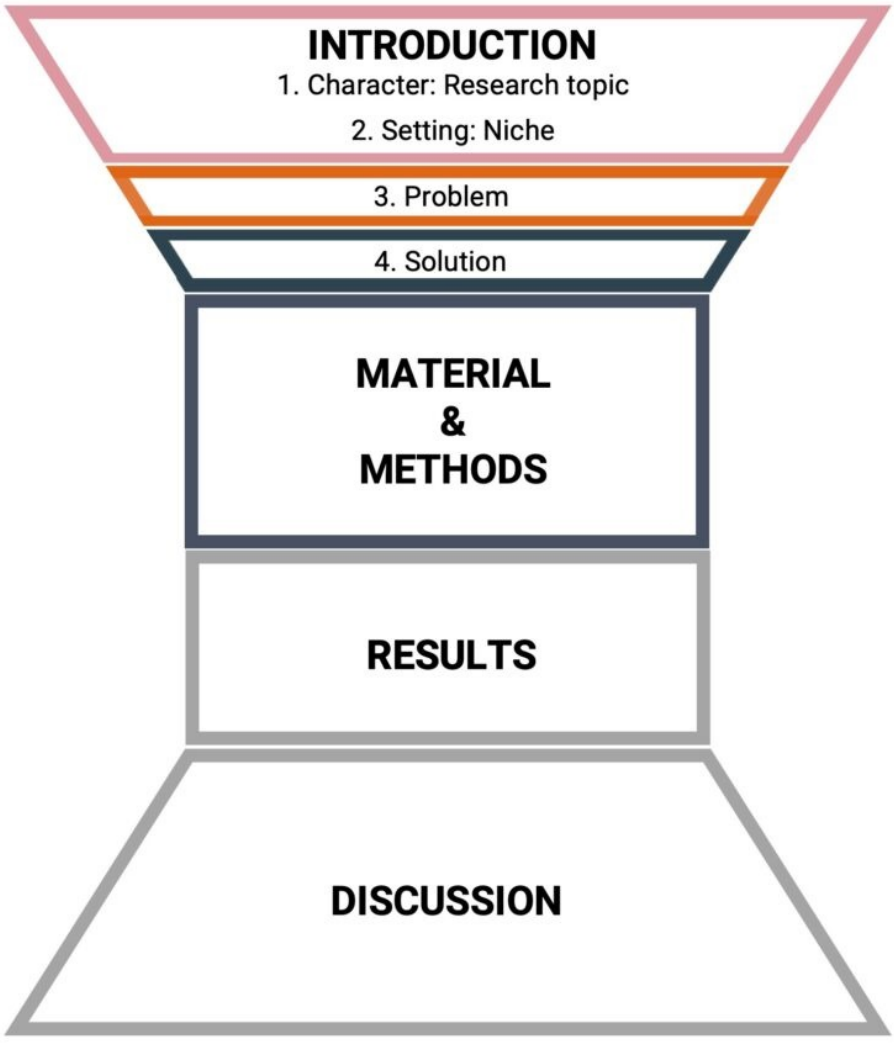
(d) Presentation

3.1 Introduction

Improvement in scientific writing is a gradual process that requires dedication and practice. As with all skills, practice writing and thinking are essential components. The more one engages in writing and critical thinking exercises, the more proficient they become. Learning by example from the writings of others is also crucial. By reading scientific literature and observing the style and format employed by professional scientists, individuals can gain valuable insights into effective writing techniques. Paying attention to how professionals articulate their research findings and present their work enhances one's understanding of scientific writing nuances. Improvement is achieved through repeated practice, involving reading, writing, and critiquing others' work.

3.2 Structure

The structure of scientific writing typically follows a standard format designed to effectively communicate research findings and insights. While variations may exist depending on the specific discipline or publication guidelines, the following structure is commonly observed (The general structure of the written work has already been discussed in Section 1.1):



- **Title:** The title succinctly summarizes the main focus or findings of the study, providing readers with a clear indication of the research topic.
- **Abstract:** The abstract provides a concise overview of the study, including its objectives, methods, results, and conclusions. It serves as a summary for readers to quickly grasp the essence of the research.

- **Introduction:** The introduction establishes the context and significance of the research by reviewing relevant literature, stating the research question or hypothesis, and outlining the objectives of the study.

- **Materials and Methods:** This section describes the materials, equipment, and procedures used in the study. It provides sufficient detail for readers to understand how the research was conducted and to replicate the experiments if desired. Include in this section:
  - Study design: procedures should be listed and described, or the reader should be referred to papers that have already described the used procedure
  - Particular techniques used and why, if relevant
  - modifications of any techniques; be sure to describe the modification
  - Specialized equipment, including brand-names
  - Temporal, spatial, and historical description of study area and studied population
  - Assumptions underlying the study
  - Statistical methods, including software programs
- **Results**: The results section presents the findings of the study in a clear and organized manner. Data are often presented in tables, figures, or graphs, with accompanying text to highlight key observations and trends. Three rules of thumb will help you with this section:
  - Present results clearly and logically

  - Avoid excess verbiage
  - Consider providing a one-sentence summary at the beginning of each paragraph if you think it will help your reader understand your data.
  - Remember to use table and figures effectively.

- **Discussion:** In the discussion section, the authors interpret the results in relation to the research question or hypothesis, evaluate their significance, and compare them with previous studies. This section also addresses any limitations of the study and suggests areas for future research.
- **Conclusion:** The conclusion summarizes the main findings of the study and their implications. It reinforces the importance of the research and may suggest practical applications or recommendations for further investigation.
- **References:** The references section lists all sources cited in the manuscript, following a specific citation style (e.g., APA, MLA, Chicago). This allows readers to locate and verify the sources of information used in the study.
- **Acknowledgments:** The acknowledgments section acknowledges individuals, organizations, or funding agencies that contributed to the research but are not authors of the manuscript.
- **Appendices:** Appendices may be included to provide supplementary information that is not essential to the main text but may be helpful for readers interested in further details or analyses.

3.3 Content

To convince the reader, a scientific approach must be followed (hypotheses, measurements, verification, proof, etc.):

- Any assertion or numerical data must be justified or, if it is not personal, must be cited by including a reference.
- The reader must be able to clearly distinguish between what is a personal contribution and what is not.
- Always discuss technological choices and possible alternatives (Why use this or that tool, language, algorithm, formalism?)
- Define and use precise and objective criteria to motivate the choice made.
- In the case of a computer experiment, the configuration of the machine (hardware) must always be mentioned. It is also necessary, for all software used during the experiment, to indicate where they come from (website to download them) and what version was used.
- For the reader to easily understand a complex algorithm, only pseudo-code is not enough. You need to use an approach that presents the big ideas, before breaking things down in detail. gradually. For example, for a large algorithm, we can:
  (a) Present the objective of the algorithm (inputs, outputs);
  (b) Give the main ideas of how it works.
  (c) Detail important ideas;
  (d) Give the pseudo-code (Only the important parts if it is long);
  (e) Apply the algorithm on an example;
  (f) Prove its accuracy;
  (g) Give and prove its complexity in time and memory;
  (h) Possibly, give an implementation in the appendix.

3.4 Style

Scientific writing typically adheres to a specific style and format to ensure clarity, accuracy, and consistency across disciplines. A style specific to scientific work should respect the following guidelines:

- **Clarity and Precision:** Scientific writing aims to convey complex ideas in a clear and concise manner. Sentences are usually straightforward, avoiding unnecessary jargon or overly complicated language.
- **Concision:** Get to the point and keep sentences short. Avoid using unnecessary words. Give only one idea per sentence.
- **Objective:** Scientific writing maintains an objective tone, focusing on facts, evidence, and logical arguments rather than personal opinions or biases.
- **Passive Voice:** The passive voice is often preferred in scientific writing as it emphasizes the action or results rather than the individual or individuals performing the action.
- **Logical Structure:** Scientific papers typically follow a structured format, including sections such as Introduction, Methods, Results, and Discussion (IMRAD). This helps readers easily navigate the content and understand the progression of the research.
- **Citation and Referencing:** Accurate citation of sources is crucial in scientific writing to give credit to previous work, provide evidence for claims, and enable readers to find further information.
- **Avoidance of Ambiguity:** Precision in terminology and definitions is essential to avoid misunderstandings. Scientific writers carefully define key terms and concepts to ensure clarity and accuracy.
- **Typography:** Respect the typographic rules specific to the language used.

3.5 Presentation

Presentation of scientific writing involves conveying complex information in a clear, structured, and engaging manner. To properly design the layout of your work:

- Use good word processing software, such as LaTeX(Section 1.3).
- Choose fonts and font sizes carefully and avoid changing them too much.
- The hierarchy of headings should be visually consistent.
- Use footnotes (but not too many) to provide details that are not necessary for understanding the text.
- To be sure that a clarification is read, it can be given in the text in parentheses.

Other elements, presented below, facilitate reading and improve the presentation:

(a) **Environments:** An environment is a part of the text that has a well-defined role, such as a theorem, a definition, an example, a demonstration, a piece of code. This part of the text is formatted in such a way that we can directly identify the environment and its role. Some environments are numbered so that they can be referred to elsewhere in the text.

(b) **Cross-references:** Any element of the text (section, equation, definition, bibliographic reference, figure, theorem, table, etc.) which has a label (in the form of a number or a few letters) can be cited in the text using this label . This quote is called a cross-reference. A capital letter is used to cross-reference a numbered environment, figure, or table ("See Proposition x", "as illustrated in Table y").

(c) **Tables et Figures:** Tables and figures make reading easier and help illustrate results or observations.

- A figure can help understanding but does not constitute an argument in itself. Choices or results must be justified in the text.
- A table allows you to summarize elements. It can for example be used in the comparison of different approaches, to give the results of tests or an empirical study.
- A figure or table must always be numbered and accompanied by a legend.
- In general, the legend of a figure is placed below it. It's the opposite for a table: the legend is at the top.
- A cross-reference in the text should appear for each figure or table.

The writing method proposed in this note includes two main stages: the organization of ideas and the writing itself. Each of these steps is iterative: the writing plan and the text must be revised until a result is obtained that best expresses the ideas.