Course 1. Scientific literature and academic writings

Outline

1. Definition of "Academic writing"
2. Key features of academic writing
3. Purposes of Scientific Writing
4. Types of scientific products
5. Actors in scientific publishing

Introduction

A significant source of frustration among higher education students is the complexity of academic writing. Students involved in conversations on this subject felt that there was a lack of clarity and precision in the term's meaning. As a result, they were left with the impression that there was inconsistency in expectations, guidance and standards. Therefore, the goal of this lesson is to explicate the nature, meaning, and process of academic writing and thought.

In addition, the present course aims help the student to follow the next courses of the MTT module, which will emphasize the need for methodical information research**.**

1. Definition of "Academic writing"

Academic writing is a **formal understandable written expression** of one's own evidence-based perspectives on a **given topic**, question or subject. Additionally, it is focused, impersonal, open-minded, objective, precise, clear, engaging, thorough and consistent with convention within its specific discipline. Because, among other things, the purpose is to convey one's arguments to the reader, it must be the primary goal to be understood how one intends to be understood. Therefore, there must be clarity of expression, depth, breadth, and cohesion of the work in the context of the discipline, subject or topic context.

Academic writing required in higher education, particularly at university, vary depending on the level and the diploma being prepared.

There are different types of academic writing, including a book report, journal article, and dissertation. Here are the most common types:

- Essay.
- Research paper.

- Research proposal.
- Thesis and dissertation.
- Lab report.
- Literature review,
- Annotated bibliography.

These writings are distinguished by an explicit purpose and a certain compositional structure.

2. Key features of academic writing

The literature identifies primary characteristics of academic writing outlined below.

a) Formal tone

- Follow convention in the field
- Avoid slang or colloquial language
- Avoid shorthand or contractions
- Organise work in properly constituted paragraphs

b) Evidence-based

- Support all arguments with evidence
- Use relevant research findings
- Use examples from practice
- Also use theoretical or conceptual propositions
- Use any other relevant literature, both published and unpublished

c) Depth and breadth

- To demonstrate depth, closely discuss or examine your arguments in detail, including questioning widely held assumptions and notions
- For breadth, consider all key counterarguments to your own and support these with evidence as well
- Include a wide range of evidence, i.e., different types and sources
- Offer balanced perspectives, including those you do not personally agree With.

d) Supportable conclusions

- Each examined argument should have a conclusion or closing
- For each argument, what is the ‘therefore’?
- You have considered multiple perspectives on the argument. So what?
- You have used multiple sources to support different perspectives. So

what?

- For each well-rounded argument, reach a closing, i.e., the central insight of that section or paragraph

e) Clarity of meaning

- Use simple, easy-to-understand language for the discipline
- Offer operational definitions of key terms of the piece of writing
- Use technical terms how they are used in that discipline, bearing in mind the audience
- Describe, explain, expand, conclude
- Be succinct or concise

f) Focused

- Every part of the writing must meaningfully contribute towards answering the question, examining the topic or fulfilling the overall purpose of the piece
- Avoid including content just because it excites you
- Everything in the piece must earn its place by clearly relating to the core purpose of the writing

g) Sustained

- Follow through every argument in a balanced manner
- Ensure every argument is sufficiently developed and concluded or closed before moving on to the next

h) Cohesion of written thought

- Sound academic work flows, and cohesion is key to presenting convincing arguments
- Ensure that there is harmony within and between your paragraphs
- Transitions between points must be logical

i) Grounded in the discipline or topic

- All content must be consistent with the discipline
- Different terms mean different things in different disciplines. Ensure meanings in your writing are consistent with disciplinary meanings
- As appropriate, include discipline-specific literature and/ or evidence
- Inferences or interpretations must be compatible with those held within the field or discipline

- Conclusions reached and insights drawn must be consistent with the field or discipline

j) Originality

- The work ought to be original, i.e., it must be your own
- Even though others' work is drawn on to extend or support one's argument, the composition of the work must be one's original effort
- Present your own arguments
- Draw your own insights
- Make your own inferences
- Use your own examples
- Reach your own conclusions

3. Purposes of Scientific Writing

Scientific writing serves as the cornerstone of knowledge dissemination, facilitating the exchange of ideas, discoveries, and advancements across diverse fields of study. Beyond its role in academia, scientific writing holds immense value for organizations seeking to innovate, inform, and influence.

3.1. Disseminating Research Findings

The primary purpose of scientific writing is to disseminate research findings to the broader scientific community and the public.

3.2. Validating Scientific Claims

Scientific writing plays a critical role in validating scientific claims and hypotheses through rigorous experimentation, data analysis, and peer review. By adhering to the principles of scientific inquiry and transparency, researchers ensure the reliability and reproducibility of their findings.

3.3. Advancing Scientific Knowledge

Scientific writing contributes to the advancement of scientific knowledge by synthesizing existing research, proposing novel hypotheses, and challenging prevailing theories. Through literature reviews, theoretical frameworks, and conceptual analyses, researchers build upon the foundations of their respective disciplines.

3.4. Informing Policy and Decision-Making

Scientific writing informs policy development, decision-making, and public discourse by providing evidence-based insights into complex issues such as public health, environmental sustainability, and technological innovation.

3.5. Promoting Critical Thinking and Scientific Literacy

Scientific writing fosters critical thinking skills and scientific literacy by engaging readers in the process of inquiry, analysis, and evaluation of evidence. Through clear and accessible communication, scientists educate the public about scientific concepts, methodologies, and implications.

4. Types of scientific products

To disseminate science through books, articles, collective works, conference proceedings, reports or theses, there are two publishing channels.

There are publishing circuits with publishers who take care of all the material aspects of publishing and non-commercial, institutional circuits, which produce abundant gray literature.

4.1. Commercial publishing circuits

In science, publishers publish all types of documents (books, journals, collective works, etc.). Only dissertations and reports are exceptions.

The publishers' objective may be commercial or not.

The main commercial publishers (Springer, Elsevier, Wiley, Taylor & Francis, etc.).

On the non-commercial publisher side, we find mainly small publishers. They are generally associated with learned societies or academic institutions.

These publishers often adhere to the open access movement.

4.2. Grey Literature

Grey literature, unconventional literature or underground literature, is that which does not go through a publisher.

4.2.1. Definition

Gray literature is defined as: “that which is produced on all levels of government, academics, business and industry in print and electronic formats, but which is not controlled by commercial publishers.”

Types of gray literature can include academic papers, including theses and dissertations, research and committee reports, government reports, conference papers, and ongoing research, among

others. As a result of its wide range of formats and scopes, gray literature is often a rich source of evidence used in systematic reviews and meta-analysis.

4.2.2. Documents of the gray literature type

Grey literature covers a wide variety of documents, most often from scientific and technical research.

The proposed list (Table 1) is not exhaustive, because representing "all the writings that fall under grey literature is an impossible challenge to meet".

Types of Grey Literature	**Examples of Publications**	**Examples of Common Sources**
Academic: Not all academic resources are scholarly and peer-reviewed! That means that lots of information academics put out is Grey Literature (This guide is an example of academic grey literature).	• Theses • Conference Papers • Dissertations • Research Reports • Articles that have not been peer-reviewed yet (pre-prints) or will not be peer-review (White papers) • Course materials • Research Posters • Surveys and Questionnaires used to collect data • Bibliographies • Lectures	• Academic Websites and Blogs • University Research Repositories Conference Proceedings
Primary Sources: Resources that reflect the views, memories or immediate responses to events primary sources.	• News Articles • Personal Journals • Social Media • Photos • Speeches • Interviews • Legislation	• Newspapers • Archives Blogs
Non-Academic Research and Reports: These are documents that are created by non-academic organizations that attempt to research topics outside of academia. Think Tanks, Policy Institutes, Research Centers, and Governments fall into this category.	• Policy Briefs • Data sets • Maps • Reports on specific programs, areas or topics • Statistics • Fact sheets	• Government Agency Publications Non-Profit Organizations
Health: These documents relate to the fields of health and medicine and are designed to be used by experts in	• Clinical Trials	• Pharmaceutical Companies

the field.	• Practice Guidelines	• Health Professional Associations
Technical: Technical grey literature covers literature that conveys highly specialized information on the interworkings of different proceedures, inventions, technologies, enginneering advancements, scientific discoveries and more. These are different from non-academic research because the intended audience are fellow technical experts and are more STEM or scientific in nature.	• Technical reports • Trade magazines • Scientific reports • Maps • Standards • Patents • Toolkits • Guidelines	• Associations, unions, and other organizations representing specific fields • Government Agencies that set standards and regulations. • Academic organizations focused on the specific field
Industry and Commercial: These items of grey literature are created to inform businesses, consumers, and industry professionals about products, markets, and industry trends.	• Business documents • Catalogues • Guidelines • Repair manuals Trade magazines	• Individual Busienesses Chamber of Commerce and other busieness associations
Program or Public Information: These items are made to report or inform outside audiences of an organization's activities. This can be made by businesses, think tanks, government agencies, academic organizations and more. This is different from primary sources as these items are updates on indivdual organizations, not events or broader topic. They differ from technical or non-academic research reports as they are not research-based, and are made for general consumption.	• Bulletins • Newsletters • Brochures/pamphlet • Directories • Posters and • advertisments • Press releases • Annual reports • Fact sheets Flyers	• Individual organization's websites Government information like Public health flyers or National Park brochures

5. Actors in scientific publishing

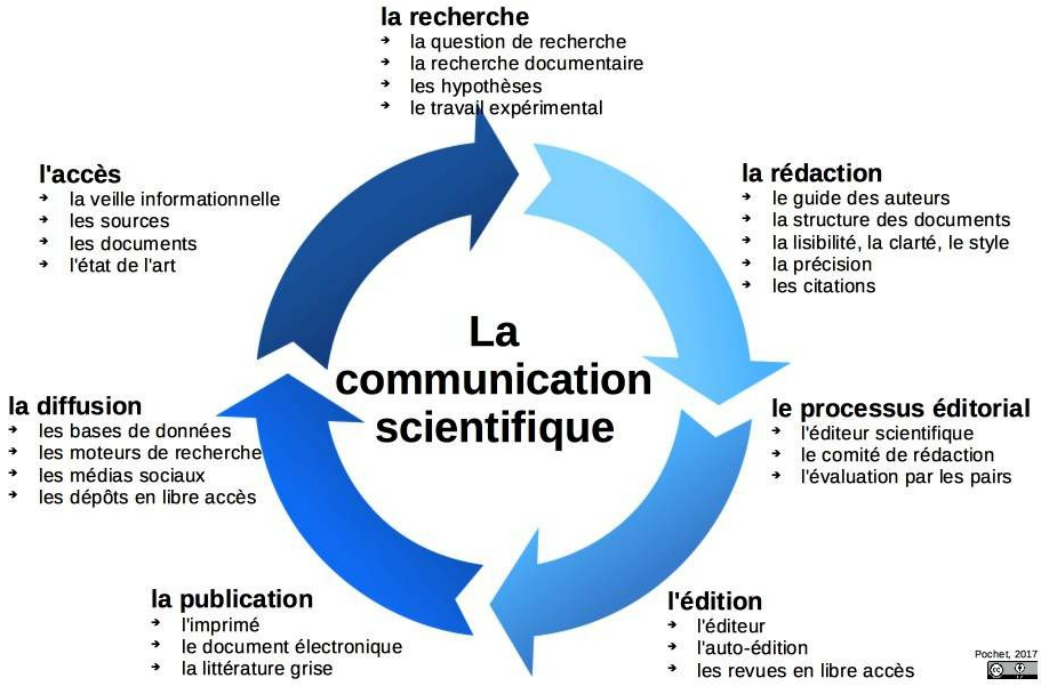
Readers are selected based on their reputation in the fields covered by the articles. They are, or have often been, also authors for these same journals.

5.1. Editing process

The ***editing process*** is located in the middle of the scientific communication processes through which scientific information passes before being accessible to a reader.

It is located between the research and writing processes and the processes of dissemination and access to information.

All of the processes can be schematized by the figure below. This chapter describes the steps managed by the editor and the scientific editor.



Schematic representation of all processes (Pochet, 2018).

5.2. Notoriety of scientific publications

Bibliometric tools: A set of tools whose objective is to make comparisons between journals, between researchers, between institutions and to propose rankings.

The impact factor (IF) of a journal or a researcher is a calculated value. The IF is the oldest tool and remains the most renowned among scientists but there are other indicators such as h index. The impact factor (IF) is calculated based on the number of citations in these bibliographies.

To calculate the IF of year X of a journal:

- we count, for the whole of year X, the number of citations of the articles published in X-2 years and in X-1 year by this journal;
- we divide this number by the number of articles that this journal published during this same period (in X-2 years and in X-1 year).