**People's Democratic Republic of Algeria.**

**Ministry of Higher Education and Scientific Research.**

**Abderrahmane MIRA University of Bejaia.**

**Faculty of Humanities and Social Sciences**

**Mr. DJADDA Mahmoud.**

**Grade; Class “A” lecturer.**

**Department of Sociology.**

**Semester 05:**

**Online course module: sociological writing techniques.**

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**Objective ;**

This course is intended for students and aims to provide common guidelines for writing sociological articles and papers according to the rules of the art.The rules employed often vary from one discipline, journal or professor to another, as well as according to the training received. This document is therefore intended to be a common tool, simple and accessible to all. However, adaptations may be made to suit specific needs It deals with page layout (pagination, margins, line spacing, font, etc.) It also covers references and citations (paraphrases, quotations, reference styles, plagiarism and fraud, etc.) Finally, it explains the rules for producing and writing a bibliography.

**Table of content**

**1-The formal characteristics of a scientific article.**

**2-The academic standards for writing a scientific article.**

**3-Les composantes et étapes de réalisation d’un article.**

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**7-Intellectual properties in the field of scientific research.**

**1-The formal characteristics of a scientific article .**

1. The structure of a scientific article A scientific document is a written and published report describing the original results of research. A scientific document must be written (an oral communication is therefore not a scientific document) and published. are not scientific documents). It must describe the original results of research. It is subject to evaluation by the journal’s reading committee according to scientific criteria. The scientific article is a contribution evaluated and published in a standardized form in a scholarly journal. According to Aristotle, every plan has two parts: the first consists of defining the problem, the second aims to solve it. A universal plan could be schematized as follows:

– Define the problem based on the diversity of phenomena (synthesis of approach)

– Solve the problem already defined by analyzing it in several parts (analysis)

– Conclusion: based on the analyzes we try to find a final solution (final synthesis).

**2. The IMRED structure**

According to Bénichoux (1985), the IMRED structure: Introduction, Material and methods, Results and Discussions (IMRAD for English speakers) makes it possible to make the structure of the article intelligible to researchers around the world, whatever the their tongue. However, it may vary depending on the type of work (thesis, article) and the discipline. This type of plan is best suited for analytical articles in the exact sciences. Standard plan:

**a) Introduction:** “The introduction to the scientific article must briefly establish the state of the art for the question to be resolved and define a precise situation in time and space” (Bénichoux, 1985, p. 61) In this introduction, the author must say the essential from the first sentences, he must cite the works of one or a few authors indicated in the list of references in order to situate himself.

**b) Material and methods:** The aim of this part is to make known all possible details of the work undertaken to allow other researchers (readers and evaluators of the article) to reproduce it for verification if necessary. The principle is to describe the experiment in a logical and/or chronological order.

**c) Results:** in this part the results obtained from the experiment are presented in detail. Generally this part contains tables and diagrams to make reading and interpretation clearer and easier.

**d) Discussion:**

This part is reserved for comments on the results. It is presented either in a single unit, or in several subunits, by comparing the results between them, by comparing them with those already published in the literature and finally by responding to the hypothesis of the work presented in the introduction and detailed in the material and methods section.

**2.2 Other types of plan**

Devillard & Marco (1993) propose other types of plans: – The OPERA plan: which means Observation, Problem, Experimentation, Results and Action. This type of plan is rather used for analytical articles and in particular in applied sciences (technology, management, etc.).

The ILPIA plan: which is presented as follows: Introduction, Literature, Problem, Implication, Future. It is best suited for review articles and surveys. **2.3 A possible plan in educational sciences**

**Introduction – Context:** Essential element, particularly when the targeted journal and its readership is located outside the author's area of ​​research and intervention Brief description (two or three paragraphs max .) of the universe in which the research described is deployed and the strategic issues underlying the theme of the article

**Problem:** Presents a critical synthesis (and not an extensive discourse) of the state of international and national scientific documentation relating to the object under study. Justifies the objective of the article (of the research presented) and introduces its theoretical framework.

**Methodology:** • Brief but essential presentation of the data collection method • Detailed description of the data collection instruments • Presentation of the sample (number of subjects; main distribution characteristics)

**Results**

**Conclusion**

**2.4 Keys to the text**

Several additional elements can identify a scientific article, namely:

\*The title: it serves as a sign, and the summary is its showcase, which is why it must be carefully chosen.

**\*The author:** the name of the author(s) as well as the institutional affiliation in which the research subject of the article is carried out appear at the beginning of the document.

**\*The summary:** Generally placed at the beginning of the article, it constitutes, with the conclusion, the most read part of scientific articles, which is why it must be carefully written.

**\*Key words:** They constitute a specificity of scientific articles. These keywords are usually chosen by the author of the article.

**\*The bibliography:** The scientific article is characterized by a solid bibliography whose references are generally classified according to standards. **2.5 Style**

Style represents the author’s truth and individuality. In scientific literature, the writing style is important, and it must be as logical and clear as possible. The use of logical connectors (thus, therefore, however, on the other hand, therefore…) is important to articulate the argument. Furthermore, the style of scientific writing varies depending on the type of writing and in the same document it varies depending on the part or chapter in question. Indeed, the style of the introduction, for example, is often descriptive in order to describe the facts and to position oneself in relation to other researchers. In the discussion or interpretation part, the argumentative style dominates. For the summary, the reduced form imposes a dense style, but reading must remain easy...a certain variety in the style helps to sustain attention.

**3/ Evaluation and criticism of an article**

Here are some evaluation criteria for a scientific article:

\*Exposes the research problem from the start of the article \*Shows how the problem is treated and developed by theory

\*Establishes links with other existing works in the literature in a relevant and informative manner without seeking exhaustiveness

\*Explains the hypotheses of the experiment if there are any (this depends on the methodology chosen)

\*Concludes within the limits of the results

\*Demonstrates how the The study was able to help resolve the issue

\*Exposes and discusses the theoretical and practical implications that can be drawn from the study

**3.1 Internal critical analysis**

How are the arguments made?

How are the results stated?

What is the nature of the conclusions?

Does the method respect the canon of research?

What makes us say that we have identified this or that other method?

Does the reader know:

\*How this research was conducted and in what context?

\*What were the contracts concluded with the participants and/or institutions? \*What are the subjects and/or situations encountered (and how many)?

\*Was there sample selection? How? If not, why and how were the subjects selected?

\*What data is collected?

\*What measures were taken to make the research valid and faithful (or credible)?

\*If there are categorizations, how were they defined? before or after data collection, why? with what checks?

\*What ethical and political implications? Research ethics: What control do subjects have over this data? Will they have access to articles or transcripts? Will they have a right of veto?

**3.2 External critical analysis Say and argue:**

\*What relevance does this methodological approach bring among others? \*Would other methods have been possible?

**2-The academic standards for writing a scientific article**

A written report, whatever the reader for whom it is intended, is intended to convince that the student has fulfilled the objectives assigned to him and respected the instructions data. Two centers of attention exist to establish this conviction: the content and the form. One of the evaluation criteria for all academic work is scientific rigor. This criterion concerns both the substance (structure of the reasoning, quality of the ideas and arguments presented, diversity and relevance of the sources), and the form (compliance with the rules regarding citation, referencing sources, spelling, organization of the text). The content of the different parts of a work Any work of university level and respecting the standards of scientific rigor will have different parts, listed as follows:

• cover page

• table of contents (this can be placed at the end of the work, before the annexes) • introduction

• chapters

• conclusion

• bibliography

• list of annexes

• annexes

**1. The cover page**

The cover page will include, in addition to the name of the student (author of the work): the academic year, the year of training. the title of the work, the type of document (internship report, project report, documentary research work), the name of the course or seminar for which the work is carried out, the name of the professor holding the course or seminar.

**2. The table of contents**

The table of contents lists the different parts of the work, specifying the pages. It allows the reader to locate a point of interest more quickly and easily. It also allows you to quickly visualize the structure of the report.

**3. The introduction**

The work will always include a general introduction. The role of the introduction is to present the problem, i.e. the subject covered (which may consist of a question and hypotheses) by placing it in its context. You will always assume that the reader is unfamiliar with the subject matter. It should serve to introduce the subject of the work. So be sure to: Relate the subject covered to its context Cite the objectives to be achieved Define the subject precisely. Also show its limits, mentioning any difficulties encountered (for example, difficulty accessing information, time constraints).

**4. The different chapters (or “main body of the report”**

To meet the objectives of the work, you will probably need to proceed in stages and therefore structure your remarks into different chapters. So pay attention to the numbering logic of these. In addition, it is always useful to resituate, in a few words, at the beginning of each chapter the logic in which the structure you have chosen fits. In other words, be sure to specify to the reader what you are going to address in this new stage. Each chapter will have an introduction and a conclusion.

**5. The conclusion**

Your report will include a general conclusion. The conclusion is an outcome, a point of arrival and not just an end. It testifies to the spirit of synthesis and the critical spirit of its authors. The spirit of synthesis will appear in the clear and skillfully formulated presentation of ideas and key thoughts developed throughout the report. Remember that an informed reader often reads the introduction and conclusion first. These two parts must therefore be logical and well articulated. It will be preferable to write the introduction and conclusion after the rest of the report so that there is consistency between the remarks developed and the summary presented in the introduction and conclusion.

**6. The bibliography**

The bibliography brings together all the sources consulted for the preparation of the report. The bibliography is found at the end of the work and can be presented in several forms: in alphabetical order by type of sources (books, journals) and inside in alphabetical order by category of problems addressed and inside in alphabetical order. To write the bibliography according to the standards commonly used in the academic and scientific world, please refer to chapter 4: the bibliography.

**7. The annexes**

Include in annexes all the documents useful to support the report but which would make reading difficult, if they appeared in the text. It is important, to facilitate reading, to number the annexes, to give them a title, and to make a list which will appear as a cover page in the appendices. This list will be mentioned in the table of contents with the pagination. You will always include the source of the document attached.

**2. Layout rules**

**2.1 Presentation**

The presentation of the report must be careful. It gives the first impression of the work. The text will be typed and paginated. You will ensure that the text is sufficiently ventilated and that the important points stand out.

**2.2 Structuring the text Before writing,** it will be important to make a writing plan which will serve as a framework. The writing plan will allow the text to be divided into several parts. Each part will be announced by a title. The parts themselves can be organized into sub-parts which will be presented by subtitles. It is important here to choose a consistent presentation and to stick to it throughout the text. The numbering must be done in Arabic numerals. The number of subdivision levels should be limited to three or four maximum.

**- The paragraph**

The paragraph is the unit, the basic cell organized in written language. It completely expresses an idea, which can itself be complex. Made up of one or more sentences, the paragraph marks a step in reasoning, develops an aspect in a description, Its length usually varies from 5 to 20 lines. The absence of paragraphs or their overabundance both indicate a problem with the structure of ideas.

**- The sentence** Be careful with sentences that are too long, which can cause construction problems. Prefer short sentences; do not develop more than one idea per sentence. If possible, try to vary the structure of your sentences to introduce a certain rhythm into your production.

**- Logical articulations**

Their function is to indicate relationships and sequences of ideas, either within the same paragraph or from one paragraph to another. They explain the links between the elements of the message, the stages of the description or the argumentation.

**2.3 Style and spelling**

You will ensure that the style is pleasant: clarity of thought, rigor of reasoning and accuracy of formulas. The vocabulary used must be precise. Label facts and concepts by name. Avoid approximations. Punctuation is fundamental for giving rhythm to a text and structuring it. The meaning itself can vary depending on the punctuation used. The spelling must be careful.

**2.4 Layout and typography**

Choose a layout and a font that you will keep for all the text (standard line spacing of 1 and character size 12).

**2.4.1. Capital letters, abbreviations and numbers**

Do not overuse capital letters and abbreviations. There are very specific rules for their use. Contrary to Anglo-Saxon customs, only the first letter of a title is capitalized. In the text, abbreviations should be as few as possible. If you use acronyms, you must explain them in a glossary that you place after the text of your report. Numbers must be expressed as figures in scientific work. Do not write, on the same page, sixty in one place, then 60 a little further on.

**2.4.2 Tables, graphs, maps, diagrams, photographs, illustrations**

You can insert these elements into the text, if they are essential to understanding it and if they are not too numerous. Otherwise, it is better to group them together in an appendix. No photograph taken from a document subject to copyright may be reproduced without the authorization of the rights holders. You must mention your source on each document, or clearly indicate whether this information was prepared by you.

**2.4.3 Pagination**

Pagination generally starts from the title page (cover page). It must be in Arabic numerals. The pagination is continuous across all the different parts, including annexes (even if these are placed in a separate volume).

**3. The rules for citing sources**

During the exploratory phase, the development of your ideas or to support this or that observation, you will be required to cite one or more authors. Four cases can arise:

- we quote verbatim the thoughts of an author;

- we summarize the thoughts of an author;

- we take an element of analysis, figures, graphs,

- but we can also refer to another part of the work. Plagiarism, which consists of unduly attributing someone else’s text or thought, is prohibited.

**3.1 The quotation and the particularities of its reference**

Quotations are always put in quotation marks, because this is the only way to allow readers to clearly distinguish in the presentation what is taken from others and your personal reasoning. Citations are necessary:

​​• to respect, for example, the rigor of a definition;

• to support your reasoning on the authority of a recognized expert in the subject. However, it is important not to overuse it. It is primarily your ability to reason and argue your reasoning that is evaluated. The quotation begins with a capital letter if it follows a colon. It starts with a lower case if it is inserted in a sentence or if it is introduced by “for”, “according to”. According to Mr. Jousse, “in writing, a completely different mechanism plays a role. » Brackets [ ] should be used to indicate that the word in brackets does not come from the author but was added to better understand the text.

**Ex.:** “This theory [that of organization and management specialists] may seem reductive”

If the quote is too long and only part of it is of interest to your reasoning, it is appropriate to replace the omitted part with three ellipsis points in parentheses. The quotation must literally and strictly reproduce the author's text (put in bold, what he puts in bold; in italics, what he puts in italics, underline what he underlines), including possible spelling errors (or typos). In the latter case, we use the indication “sic” in parentheses directly after the error or typo noted. This means that the error is not your fault. Quotations, enclosed in quotation marks, will be followed by a superscript number which refers to a footnote reference. The numbering of footnotes can be continuous throughout the work or started again on each page.

**3.2 References in footnotes**

**-** General References in footnotes follow the same rules of presentation as the bibliography. In addition, whatever the case, the reference in the footnote must mention, precisely, the page (p. X) or pages (pp. X-Y) of the work cited. Every reference ends with a period.

Successive citations: The first reference is complete.

If the second or third reference on the same page refers to the same work, it is appropriate to note AUTHOR'S NAME, FIRST NAME INITIAL, op.cit., followed by the page number.

**Quotations from authors used by another author:** it is appropriate to note as a reference the work that you have consulted and which uses the words of these other authors. Ex.: M. Mauss¹ studied the difficulties of the investigation...Quoted by VILLETTE, M., The art of internship in business, Paris, Editions La Découverte, 1994, p. 44. 3.3 The summary of the author's thoughts, of one or more ideas and the particularities of their reference It is necessary to introduce the idea or the summary with a sentence, cite the name of the author from whom we draw inspiration including the full reference at the bottom of the page.

**3.4 Resuming tables, graphs, figures and the particularities of their reference**

When resuming tables, graphs from a document, the origin must be mentioned.

The source will be indicated as follows:

- directly below the table or graph;

- by the mention: Source followed by the complete reference. If figures are used, a footnote with the full reference will be written.

**3.5 Referring to other pages of your work In the body of the text**, you should enter a superscript number. In the footnote, we indicate:

- “Cf. supra p.” if we refer to a part developed previously;

- “See below p. » if we refer to a part which will be developed subsequently.

**4. Bibliography**

APA style and in-text citations When you use APA standards to write your assignments, it must be double-spaced from start to finish. When using another person's words or ideas, it is important to acknowledge the source. If you express someone else's ideas in your own words, it is a paraphrase, while transcribing an idea without modification constitutes a quotation. Indicate the source of a paraphrase by noting the author's last name and year of publication in parentheses. Indicate the source of a quotation by noting the author's last name, year of publication, and page number near the quotation. Quotations of less than 40 words may be embedded in the text and placed in quotation marks. **Ex.:** According to our observations, “students are increasingly interested in smaller classes” (Tremblay, 2003, p. 88).

Place longer quotes in a separate paragraph. In this case, indent the text on the left side only (the indentation is approximately five spaces) and double-spaced. Also, omit the quotation marks. Any in-text citation must be entered in detail on your references page, regardless of whether it is a paraphrase or a quotation. [See example below. Please note that the name "Tremblay" is used as an example only.]

To indicate the source of a paraphrase, you can simply add the author's name and year of publication in parentheses, after the statement (Tremblay, 2003). However, you can do things differently to make your text more readable. For example, Tremblay (2003) suggests that you modify the chosen format.

**Ex.: Tremblay (2003) wrote the following about longer quotations in the text:** This is a quotation of more than 40 words. Each line of this paragraph is preceded by a paragraph one-half inch from the left margin. However, the text continues to the right margin. Double spacing applies to the entire paragraph. There are specific guidelines regarding the use of single quotation marks (“ ´ ) or double quotation marks (“ ”) when a quotation is part of another quotation. See the APA guide for more information. (p. 6)

How many authors should be named in an in-text citation?

\*When a work has two authors, always cite both names with the year each time you mention the work.

\*When a work has 3, 4 or 5 authors, cite them all the first time you refer to that work. Any subsequent mention of this work must include only the last name of the first author, followed by the mention “et al. » and the year (if it is the first citation appearing in a given paragraph).

\*When a work has 6 or more authors, cite only the last name of the first author, followed by “et al.” » and the year.

**Citing a work mentioned in a secondary source**

When you must cite an author mentioned in a secondary source (that is, a source other than the one in which the author's original words appear), ensure that the citation in the text contains the name of the author of the original work, which will be followed by the statement (as cited in the secondary source, date). For example, if you have a copy of a book by Tremblay in which he mentions a work by Bernier, your in-text citation will be to Bernier's work (as cited in Tremblay, 2002). Your reference page should only include the secondary source, in this case Tremblay.

**General Rules to Follow When Developing a List of Bibliographic References**

According to APA Standards Layout of the Reference List

\*Arrange all references double-spaced.

\*Name all sources that you cited or summarized in the text of your work. \*References should be placed in alphabetical order by the last name of the first author.

\*Works by the same author must be arranged in chronological order, from least recent to most recent.

\*Use the summary paragraph (paragraph where the first line is solid and the others are offset five spaces from the left margin).

\* Preferably insert the doi for electronic sources. If a source does not have a doi, insert the electronic sources URL (see examples of references in APA format below).

\*When inserting the URL address, precede it with “retrieved from” or “located at”.

\*References to journal articles must include the name of the author (or the title of the article if no author is mentioned), followed by the statement (year, day month). Author

\*Author names must begin with the last name, followed by a comma and then the first initial. Indicate only the initials corresponding to the first names and precede the last author's name with the conjunction “and”.

\*When eight or more authors are named, list the names of the first six authors, then add three periods and write the last author.

\*When no author name is given, the reference is inserted in the reference list according to the first distinctive word of the title (do not take into account the determinants at the start of the title, e.g. The

**Date**

\*Put the year in parentheses after the authors and end with a period (after the parentheses). s. d. means without date. It is used with sites whose content changes frequently.

\*In the case of references relating to newspaper articles, a comma must be added after the year, then the day and month. Title of book, article or periodical \* Capitalize only the first word of the title of a book, article or periodical title, excluding of course proper nouns.

\* Italicize titles of books and periodicals, as well as the volume number of periodicals.

**Collective work**

\* In the case of a collective work, you must write the initial of the first name then the name of each of the directors and end with “dir. » placed in parentheses followed by a comma.

**Page**

\* Precede chapter page numbers in a collective work with the abbreviation “p. » or “pp. » if there are several pages. Do not insert the “p.” » for periodical articles.

\* Indicate the volume number in italics then the number of a periodical in parentheses without italicizing it.

**Country and publishing house**

\* The city of publication must be followed by the country. In the case of United States states, the two-letter abbreviation must be written. In the case of Canadian provinces, there is nothing mentioned in the book Publication manual of the American Psychological Association, therefore you can write the country (Canada) or in international two-letter code (MB).

\* Provide full publisher name, but omit abbreviations (Inc., Co.).

**Choice of presentation**

\* When there are several versions to present an element, you must choose one and keep it throughout your reference list.

\* Choose the country or international province code for Canadian cities.

\* Choose “located at” or “retrieved from” for the URL address. English version

\* Author names must begin with the last name, followed by a comma and then the first initial. Only indicate the initials corresponding to the first names and put the ampersand preceded by a comma (, &) between the penultimate and the last.

\* Capitalize the first word of the title of a book, article or title and also after a colon (:).

\* In the case of references relating to newspaper articles, a comma must be added after the year, then the month and the day. Please note that these guidelines are provided for general guidance only. Always refer to the Publication manual of the American Psychological Association 6th edition for official APA standards.

**Examples of references in APA format**

**Periodical article with two authors**

Ait-Chaalal, A. and Legrand, V. (1997). The French-speaking world and the southern Mediterranean. Politics and Societies, 16(1), 77-100.

**An article from a magazine or newspaper**

Filippi, M., Agosta, F., Abrahams, S., Fazekas, F., Grosskreutz, J., Kalra, S., . . . Masdeu, J.C. (2010). EFNS guidelines on the use of neuroimaging in the management of motor neuron diseases. European Journal of Neurology, 17(4), 526-533.

Laferrière, T. (1999). Learning in networks: an essential educational option at the dawn of the new millennium. Education Canada, 39(1), 12-15. Martin, N. (2006, June 23). Retiring principal claims he was bullied. Winnipeg Free Press. p. at 8.

**Printed article with 8 authors**

Filippi, M., Agosta, F., Abrahams, S., Fazekas, F., Grosskreutz, J., Kalra, S., … Masdeu, J. C. (2010). EFNS guidelines on the use of neuroimaging in the management of motor neuron diseases. European Journal of Neurology, 17(4), 526-533.

**Article with doi**

Nadeau, D., Giroux, I., Dufour J. and Simard M. (2012). Pathological gambling in patients with Parkinson's disease. Mental health in Quebec, 37(1), 189-202. doi: 10.7202/1012651ar

**Article with URL address**

Helmer, C., Pasquier, F. and J.-F. Dartigues (2006). Epidemiology of Alzheimer's disease and related syndromes. M/S: medicine sciences, 22(3), 288-296. Retrieved from <http://id.erudit.org/iderudit/012784ar>

**Book written by a single author**

Levasseur-Ouimet, F. (2003). From year to year: from 1659 to 2000: a synchronic presentation of Franco-Albert historical events. Edmonton, AB: Heritage Institute, Faculté Saint-Jean. Chapter taken from a book edited by several people Dalley, P. (2002). Multiculturalism and the school of the French-speaking minority in Canada. In C.

Couture, J. Bergeron and C. Denis (eds.), Alberta and francophone multiculturalism: testimonies and issues (pp. 127-143). Edmonton, AB: Center for Canadian Studies of the Faculté Saint-Jean, Multicultural Association of Alberta.

**An adaptation and/or translation of a book or a chapter of a book**

Pervin, L., & John, O. (2005). Personality: theory and research (adapted by L. Nadeau, D. Acier, & D. Miranda; translated by S. Dupont, & L. Lepage). Montreal, QC: ERPI.

Berg, J., Tymoczko, J. and Stryer, L. (2008). Biochemistry (6th ed.; translated by M. Darmon). Paris, FR: Médecine-Sciences Flammarion.

De Grandmont, N. (2010). Acceptance of difference in society: historical perspective and reflective elements. In N. Rousseau (Dir.), The pedagogy of educational inclusion – avenues of action for learning together (pp. 47-61).

**Books and e-book chapters**

Montoya, Y. (ed.). (2006). Today's school facing change: instructing, educating or socializing.

Quebec, QC: Les Presses de l’Université du Québec. Retrieved from ebrary database.

When you want to indicate the general location of an eBook rather than its specific address, use "Available at" instead of "Retrieved from." Then insert the doi or in the absence of it the URL address of the website where the book can be consulted.

Gros, F. (2006). Comparative state of science in Africa. In C. Cloutier and V. Fournier (eds.), Sciences and developing countries: French-speaking sub-Saharan Africa (pp. 23-24). Les Ulis, France: EDP Sciences. Retrieved from NetLibrary database.

When citing an e-book chapter, use the same format as citing a print book chapter, but include the source of the document (e.g., doi, database name, or URL) at the end of the quote.

**Video recording**

Jeunet, J.-P. (2004). A long engagement Sunday [video recording]. Burbank, CA: Warner Bros. Entertainment.

**Websites**

When the citation refers to an entire website, it is sufficient to indicate the URL address in the text. If, however, you decide to include it in your bibliography, indicate the date of consultation of the site if it is regularly modified as is the case with Wiki sites.

Theory. (n.d.). In Wikipedia. Retrieved May 26, 2013 at <http://fr.wikipedia.org/wiki/Th%C3%A9orie>

Anyone who has gone through the ordeal can confirm this: writing a first scientific article is one of the most difficult and frustrating experiences in a researcher's career. Synthesizing complex research work in a few pages, in a clear and concise manner, may seem at first glance to be an impossible task. Fortunately, by approaching the problem one step at a time and in a structured manner, writing an article becomes much simpler. Additionally, the writing process will, over time, become easier and easier.

**A scientific article is generally composed of the following parts:**

**A title**

**A list of authors and their affiliations**

**A list of keywords**

**An abstract**

**An introduction**

**A literature review**

**A methodology**

**A presentation of experimental results**

**A conclusion**

**A short paragraph of acknowledgments**

**A list of bibliographic references**

**A series of appendices**

The body of the article is normally made up of parts from the introduction to the conclusion. These parts typically correspond to separate sections presented in this order, each answering a different question:

**1. The title**

A good title should adequately describe the content of the article, without being too long or too short. The following guidelines can be used when selecting the title:

\*Choose a title that will attract the reader's attention and arouse their interest. \*Aim for between 10 and 12 words.

\*Use words that highlight the field or application of the research, and its originality.

\*Choose words likely to be the keywords of a query in a search engine. For example, the standard keywords of an application or approach.

\*Avoid unnecessary words such as “Observations on” or “A study of”.

\*Avoid abbreviations and symbols.

\*Avoid qualifiers such as “new”, “novel”, “better” or “improved”.

**2.2. The list of authors**

If the article has several co-authors, it is necessary to determine the order in which their names appear in the article. Seemingly banal, this decision can be a source of conflict because the order of authors is often associated with the importance of their contribution to the work. In particular, greater recognition is traditionally given to the first author on the list, which may advantage that author when applying for scholarships or grants. The rules used to determine the order of authors vary from one research team to another, and this order is normally chosen by the team director.

**The rules most often encountered are as follows:**

**Order of contribution**

Authors are listed according to their contribution to the preparation of the article or to the funding of the research, going from the greatest contribution to the least. Some supervisors will intentionally put students on the project as first authors, in order to increase their chances of getting a grant.

**Alphabetical order**

To avoid conflicts, some people will prefer to put authors in alphabetical order by their last name. This rule is also used for articles with a large number of authors.

**Other Considerations**

Other rules may also be used to determine the order of authors. For example, in the healthcare field (and, by extension, in biomedical engineering), it is common for the team director to be placed last, which gives them special recognition.

It also happens that authors are sorted according to their affiliation (e.g., university, department, etc.) or their role (e.g., student, supervisor, co-supervisor, etc.).

**3. The abstract**

The summary plays an essential role in an article. On the one hand, it serves to arouse the reader's interest and quickly remind them of the nature of the work. A good summary will encourage the reader to read the entire article, while a poorly written summary will have the opposite effect. On the other hand, while access to the full article is often limited, the abstract is normally available without restriction. A good summary should be a condensed version of the article, following the same structure as the article and highlighting the main points of each of its sections. Here are some instructions to follow when writing the abstract:

\*The abstract must clearly mention the following elements:

\*The context and the research problem.

\*The objectives and main contributions.

\*The main stages of the methodology (e.g., experimental framework, analysis approach, etc.).

\*The most important results and conclusions.

\*The abstract must clearly highlight the original and innovative aspect of the work.

\*The abstract must respect the length constraints imposed by the journal or submission system (typically between 150 and 250 words).

\*The abstract must be independent of the article, and should be able to be read without having to consult the latter.

\*The summary should not be a second introduction. That is, it must be a complete summary of the article and include the methodology, results and conclusions.

\*The abstract should not contain references to the literature, figures or tables in the article.

\*The summary should not contain acronyms or abbreviations unless they are known and conventional.

**Keywords**

Most conferences or journals require authors to provide a list of 3 to 10 keywords that will be used to classify and index the article. Just like the title, the choice of this list is important because it will allow readers to find the article more easily, from a query related to the same theme in a search engine. Follow these instructions for choosing keywords:

\*Do not separate compound words forming a single semantic unit. For example, we would put the compound word wireless communications in the list, instead of the words wireless and communications separately.

\*Include all important words (single or compound) from the title and abstract. In some cases, it may also be relevant to include important words from the journal or conference title, for example, the compound word environmental science for the International Conference on Energy and Environmental Science.

\*Use the plural for keywords designating a quantifiable element. Thus, we will prefer networks to network.

\*Avoid unconventional abbreviations and acronyms. For conventional acronyms, one can also add the spelled form of the acronym as a compound word. For example, we would put the acronym VCSEL and the compound word Vertical Cavity Surface Emission Laser as two separate keywords.

\*Do not link, if possible, compound words with a hyphen. For example, put knowledge management instead of knowledge-management.

\*Respect the constraints of the conference or journal (e.g., minimum and maximum number of key words, lowercase or uppercase letters, alphabetical order or importance, etc.).

**5. The introduction**

Being the first section encountered by the reader, the introduction can have a significant impact on their perception of the entire work. A poorly written introduction, or one in which the motivations, objectives or contributions of the research are not clearly described, will leave a bad impression on the reader. It is therefore important to pay particular attention to this section.

**A good introduction typically contains the following parts:**

**Context**

The introduction normally begins with a general presentation of the context (e.g., domain, application, process, etc.) in which the research takes place. The role of this part is twofold. First of all, it naturally leads the reader to the specific research problem. Then, it serves to motivate the research by describing the importance of its context.

**Problem**

Once the general context has been established, it is necessary to identify more precisely the problem or question specific to the research presented in the article. For example, it could be a limitation of existing approaches, a new or different application, an open question, etc. Once again, it is necessary to emphasize the importance of the problem targeted or the question addressed by the research, so that it is not perceived as simplistic or useless.

**Contributions**

The following part serves to describe the approach proposed to answer the problem or research question. The objective is not to describe this approach in detail (this will be done in the Methodology section) but rather to present its broad outlines, emphasizing its advantages and innovative aspects.

**Outline of the article**

It is common to end the introduction by presenting the structure of the rest of the article.

**6. The literature review**

As its name indicates, this section is used to present the main works in the literature on the same subject as the article. The objective is not to provide a complete overview of the work in a field, as done in a Literature Overview type article, but rather to situate the contributions of the article in relation to previous work. This section also demonstrates to the reader their knowledge of the field. Respect the following guidelines when writing the literature review:

\*Focus on recent works, if possible considered to be the state of the art for the targeted problem, and on those (perhaps less recent) which contain the ideas closest to those used in the article.

\*Limit yourself to quality publications, in reputable journals or conferences. This means that you have to read the referred articles! \*Structure the work coherently, for example, according to the approach they propose or their application.

\*Identify the respective advantages and limitations of the works cited.

\*If the same authors have published several articles on the same subject, cite only the most recent work or that which is most closely related to the article you are writing.

**7. Methodology**

This section normally constitutes the central core of the article. It is in this that we explain in detail the main elements of his research, the stages of its realization, as well as the experimental approach used to validate his hypotheses.

**Structure and titles**

Methodology is very often the longest and most complex section of an article. It normally contains several subsections and it is not uncommon to even have sub-subsections. It is therefore important to structure your presentation well, so that the reader can follow and understand each of its parts, without having to go back or read another section.

To make it easier for the reader, it is necessary to choose meaningful titles for the subsections. A good title should give a clear idea of ​​the content of the subsection, using as few words as possible.

**Notation**

Scientific articles often use mathematical symbols to identify different variables, constants, parameters, etc. of the research method.

The use of such symbols greatly simplifies writing, but can also confuse the reader, particularly if the reader is unfamiliar with the notation used. To make reading as easy as possible, you must make sure to present the notation at the beginning of the methodology. This corresponds to: Specify the general rules of notation. For example, it is common to use a capital letter to designate a matrix, a bold lowercase letter for a vector, and a lowercase letter for a scalar

Define each of the symbols used in the methodology, specifying its type (e.g., number positive integer, m x n matrix of real numbers, etc.) and its role (e.g., meta-parameter of the model, variable representing a certain element of the model, etc.)

**Theoretical framework**

Before describing its research method in detail, it can be necessary to present the theoretical framework on which this method is based. The latter is composed of general principles recognized in the field, which are used or adapted in its own method. The objective of the theoretical framework is twofold:

\*Motivate one's own work by linking it to recognized concepts

\*Lighten the presentation of one's method by referring to work using the same concepts Description of the method Once the notation and the theoretical framework are presented , we can then describe our own research method. Depending on the nature of the research, this description may contain the following elements:

\*The main stages of the methodology (e.g., analysis, design, implementation, etc.).

\*The major components of the system or experimental setup, as well as their role, properties, etc.

\*Calculation processes in the form of equations, circuits or algorithms.

\*The theoretical characteristics of the method (e.g., independent variables, dependent variables, treatment of confusing variables, etc. in the case of mathematical modeling, or complexity in terms of calculation time and memory, etc. in the case of an algorithm).

\*The following advice should be considered when describing the method:

\*To facilitate the reader's understanding, present the general principles of the method before its details. For example, we can illustrate the method using a conceptual diagram and describe the different components of this diagram. \*Ensure the reader has all the details necessary to reproduce the work described in the article.

\*Justify your choices of analysis, design, etc. using theoretical arguments (e.g., mathematical proof), recognized principles or empirical data (in this case, these must be abundant). Cite works from the literature if necessary.

\*Center the content of this part around the research objectives and contributions presented in the introduction. The main contribution should thus occupy a larger part than the minor contributions.

**Experimental protocol**

\*As the number of research works continually increases, the experimental validation of this work becomes more and more important. Consequently, even if an article offers original contributions and good results, it can still be rejected if its experimental protocol is incomplete or inadequate.

**A good experimental protocol should therefore have the following two properties:**

**Sensitivity and Specificity**

The experiments must make it possible to validate or invalidate an initial hypothesis. The experimental conditions must therefore ideally have been controlled to properly measure the desired effects (sensitivity) and only measure these effects (specificity).

**Reproducibility**

As with the method description, it is essential to provide all the necessary details to repeat the experiments described in the article and obtain the same results or conclusions. This may include: The data used in the experiments, the nature of this data and its sources. If this data comes from simulations, describe the process and parameters used to generate it. The environment in which the experiments were carried out. For example, if the tests were carried out by computer means, specify their hardware and software characteristics (e.g., number of processors and their speed, quantity of RAM, programming language, etc.). If the tests use measuring instruments, all their relevant characteristics will be specified (e.g. brand, precision, method used, etc.).

\*The different approaches tested, as well as the parameter values ​​used during the tests.

\*Metrics used to assess the validity of the approaches tested.

**Relevance**

\*An equally important property of the experimental protocol is its relevance. Characteristics common to relevant protocols are as follows:

\*The data corresponds well (e.g., size, complexity, etc.) to that which may be encountered in the research application.

\*The approaches used as comparison standards are considered state-of-the-art. \*The procedure for determining the parameters of the tested methods is non-biased, so as not to favor certain methods to the detriment of others.

\*Evaluation metrics are those commonly used for the problem in question.

**8. Results**

The role of this section is to present its main results and analyze them according to the questions and hypotheses of its research. The results are normally presented in the form of tables and figures, the sequence of which respects a logical order. For example, this sequence could correspond to different experiments, each aimed at a certain research question or used to study a certain property of the proposed approach. The text in this section should follow this same sequence and, by referring to the tables and figures, highlight the results necessary to answer the research questions and hypotheses.

**Tables and Figures**

After reading the title and abstract of an article, many readers will directly consult its tables and figures to decide whether it is worth reading or not. These tables and figures must therefore be visually interesting and easy to understand without having to refer to the text. Here are other instructions to follow when developing tables and figures:

\*Limit yourself to tables and figures directly related to the research objectives, questions and hypotheses.

\*Do not use tables or figures if their content can be easily presented in the text. \*Create a legend for each table or figure which, without being too long, allows its content to be understood without having to refer to the text.

\*Put the legend above the tables and below the figures (or, where appropriate, follow the instructions provided in the conference or journal template). \*Ensure that all tables and figures are cited in the text, and that they are numbered according to their order of citation.

\*When referring to a specific table or figure in the text, capitalize the first letter. For example: “As shown in Figure 1…” or “See Table 1 for…”.

\*Avoid tables and figures that exceed the permitted width or height. \*If the content of a table or figure comes from another article, cite that article in the caption. If a figure is reproduced in its entirety, ensure that you have permission from the copyright holder of that figure.

\*Use a figure as often as possible to illustrate complex diagrams, instead of explaining these diagrams in words (i.e., a picture is worth a thousand words). \*Choose a table instead of a figure if the exact value of a result is more important than its trend or the relationships it expresses.

\*Order, if possible, the columns and rows of a table in a logical sequence. \*Choose titles for table columns and/or rows that highlight their role.

\*Avoid horizontal or vertical lines within a table as much as possible.

\*Produce graphics and illustrations on the computer, never by hand.

\*Put any detailed explanation of a figure in its legend and not directly in the figure.

\*Avoid colors to distinguish the elements of a figure (e.g., the curves of a graph) because the article could be printed in black and white (unless it is, for example, an article on generation or perception of colors). Instead, distinguish these elements using different styles (e.g., dotted lines, different fonts, etc.).

\*Use informative titles to identify the axes of a graph. Specify the axis units next to these titles.

**Statistical analyzes**

Results must always be interpreted objectively, without extrapolating or seeking conclusions not supported by them. Thus, a reader should normally be able to arrive at these conclusions on their own, if presented with these results objectively. A conclusion that seems a priori supported by the results may, however, prove to be erroneous if it does not have the required statistical significance. This error is often encountered in comparing different approaches, where an approach is declared the best if its average performance over a number of tests is greater than that of other approaches. However, if the number of tests is very small or the standard deviation of the results is very large, these results may be largely due to chance.

To avoid these kinds of errors, it is recommended to use statistical hypothesis testing. To carry out such a test, you must first formulate a hypothesis (called the null hypothesis) related to the question you are trying to answer.

**Interpretation of the results**

It is generally not enough to analyze the results using statistical tests; they still need to be interpreted. For example, a statistical test could indicate that on average, calculation method A gives results closer to reality than calculation method B, with a confidence level of 95%. However, the test does not give any interpretation of the result, that is to say no information on why method A is better than method B. It is therefore wise to put forward plausible explanations (based on on the methodological details of approaches A and B, and on the characteristics of the data they process) for the results obtained.

**9. The conclusion**

The conclusion serves to summarize the objectives, contributions and main results of the research. This section typically has the following three parts. **Reminder of the objectives and contributions**

The conclusion often begins with a brief reminder of the objectives and contributions of the research. Even if these elements have already been stated in the introduction, they may have been forgotten while reading the article. Additionally, having now read the article, the reader is now able to better understand and appreciate these goals and contributions.

**Summary of key results and main conclusions**

The following part helps answer the research questions or evaluate the achievement of the objectives, by highlighting the key results of the article and its main conclusions. This part should address the following questions:

\*Do the results help answer the research questions or confirm the hypotheses? \*How do the results compare with those in the literature?

\*If certain results go against the initial research hypotheses, how can we explain these results?

\*In light of the results, what are the strengths, weaknesses and limitations of the research or the proposed method?

\*What are the main implications of the results?

**Future work**

It is customary to end the conclusion by suggesting future work to answer new or additional questions raised by the research. If the work described in the article is part of a multi-stage research project, we can also mention what the next stage will be.

**10. Acknowledgments**

Between the conclusion and the references, you can insert a short paragraph to thank the people (other than the authors) and organizations who helped carry out the work.

Contributions that may be recognized are: Advice or assistance that has had a significant impact on the advancement or scientific value of the work. In the case of a journal article, this may include suggestions offered by referees. \*Funding from a public or private organization.

\*Data used in the experiments, which were provided by other researchers, an organization, or a company (in some cases, this type of contribution will guarantee a full place in the list of authors rather than 'a simple thank you).

\*The implementation of a method developed by other researchers, in the form of a program or source code, as well as any help to understand this method

**11.The bibliography**

The bibliography of an article contains the list of articles, technical reports, theses and other publications cited in this article. The following instructions should be considered when developing this part:

\*An article must contain a bibliography and refer to works other than those of the authors. Even a short conference paper should normally include at least 5 references.

\*Limit to references having a direct link to the work described in the article. Except for Literature Overview articles, an article should not have much more than 40 references.

\*Ensure that each reference included in the bibliography is cited in the text of the article. \*Respect the style imposed by the conference or journal (e.g., ACM, APA, IEEE, etc.).

**A style specifies, among other things:**

\*The order of references (e.g., alphabetical, citation, etc.) in the bibliography. \*The format of the in-text citation. For example, (Aras et al. 2006).

\*The format for the name of the authors (e.g., S. Aras or Aras, S.), etc.

\*Avoid, if possible, citing unpublished work. Identify articles accepted but not published with the mention “in press” or “forthcoming”.

\*Do not cite personal communications unless they contain essential information not available elsewhere. Ask the author’s permission before including these types of references.

**12. Appendices**

An article can sometimes have one or more appendices, located at the very end, which present certain important elements (e.g., results in the form of tables or figures, diagrams, mathematical proofs, etc.), but not essential to understanding of the article. This type of appendix is ​​most often found in journal articles, where length constraints are less restrictive.

**Here are some guidelines to follow for appendices:**

Append only those tables or figures that support the conclusions of the article but are not essential to its understanding. You should not have to consult an appendix while reading the article.

To avoid breaking up the layout, consider appending large tables or figures.

Be sure to refer to the appendices in this body of the article and, if possible, provide a short description of these appendices in the text.

**5-Scientific writing and literary writing**

Literary writing designates a type of writing specific to literature as opposed to ordinary writing. Literary writing would be characteristic of the professional writer who intends to write in a public setting, produces a work, and receives institutional recognition thanks to its publication. On the contrary, ordinary writing would be the prerogative of the amateur who writes on a daily basis in a relatively private setting, whether academic (note-taking, writing, dissertation, etc.), professional (reports, emails ...) or domestic (correspondence, diary, shopping list...), often in handwritten form.

These two types of writing are generally endowed with unequal functions and values:

\*Literary writing would have an aesthetic function, while ordinary writing would have a utilitarian use.

\*Literary writing would be beautiful and exceptional, while ordinary writing would be bland and banal.

Literary writing obeys the rules of prescriptive grammar in force at a given time and place, although it can occasionally break free from them, and in doing so, redefine these rules for posterity. For example: a poet can take poetic licenses by permanently modifying the spelling of a word, or a novelist resort to neologisms which will then enter the language for his successors.

Literary criticism, linguistics and stylistics have attempted to define what essentially distinguished literary writing practiced by professional writers from ordinary writing practiced by amateurs by putting forward the criteria of work on language and aesthetic intention. Roman Jakobson, for example, noted that the characteristic of literary writing would be to be endowed with a “poetic function”. Roland Barthes, for his part, noted that for writers, "to write" was "an intransitive verb" because it was an end in itself, while for others "to write" was a means. In order to determine whether a piece of writing is literary, we can then rely on the taste of the reader, capable of recognizing and appreciating the beauty of an object (criticism based on reception); or document the work of the writer by consulting previous states of this writing, or by reading the paratexts of his works and his personal documents (genetic criticism). Indeed, most literary writings require several drafts: a first draft, spontaneous, and a second draft (and many others), which are those, rested, of taking control of the text, when the writer gives the consistency, work on style.

**The criterion of publication: Writing for the public** :

The characteristic of literary writing is perhaps to aim for publication, and therefore to be read by a large public. However, Louis Aragon was able to write: “Writing [had been invented] to fix, rather than ideas for others, things for oneself. »

Certain private writing practices give rise to works published after the death of their author, or even against their wishes, and are nevertheless considered literary writings because of their aesthetic quality.Writing correspondence or keeping a diary can today be considered literary writing, whereas this was not the case in the 17th century, for example. The criterion of publication is therefore not infallible for distinguishing literary writing from ordinary writing.

**Scientific writing**

All scientific content requires good writing skills. To write a good scientific article and avoid errors, it is important to know certain writing rules and methods.

**What is scientific writing style?**

Scientific research articles follow a precise structure and must have an appropriate writing style.

\*Scientific writing pays particular attention to certain elements.

\*Turns of phrase, which must convey information clearly.

\*Syntax and spelling, which must be understandable and error-free. \*Compliance with certain rules, which must be applied in a coherent and harmonious manner (references and citations, paraphrases).

\*The organization of the structure: length of sentences, spacing of paragraphs. \*Vocabulary and explanation of important concepts.

**Why is there a need for a scientific writing style?**

Adopting an appropriate scientific writing style allows you to assert the seriousness of the research while taking the readership into account. The author can thus present his position and his reasoning in a readable and coherent manner. With the development of open access, more and more articles are available online for free. The care taken in writing is therefore essential: scientific content must be accessible to a large number of readers while demonstrating a high level of expertise.

**Write a convincing article**

A well-written article or scientific content is more likely to please the reading committee (or editorial committee) of the journal as well as its readers. Well-crafted writing reinforces the credibility of the content and thus increases its potential to be cited by other researchers. Of course, the quality of the scientific demonstration is essential. However, a clear and pleasant aspect highlights this scientific journey.

**Simplify the reader's understanding**

An article written in a careful scientific style allows readers to understand the logic of the author(s)' reasoning. This type of writing facilitates the transmission of information with pedagogy.

**Scientific style: important rules**

There are a few rules you need to know to know how to write properly. They mainly concern the use of references, sources and paraphrases in order to avoid plagiarism.

**1. Citation of sources in the text**

All scientific content is based on sources. Since they concern the work of others, it is necessary to cite them. Some articles cite in quotation marks and specify the author's name, while others use APA standards in the text.

**2. References in the bibliography**

The bibliography also presents all the sources on which the author relied. Structurally, this section is often located at the end of the document. Its presentation can be imposed by the journal (font size and type, organization of elements, classification of works).

It is important that this section is coherent: the sources used must converge towards the same theme.

**3. The use of footnotes**

Footnotes are references placed at the bottom of the page. They are numbered and allow you to develop part of the text or to give the details and characteristics of a work. Like citations or references in the bibliography, references placed at the bottom of the page must follow the model requested by the journal.

**4. Paraphrasing**

Paraphrasing means explaining someone else's idea without quoting text with quotation marks. Its use is quite frequent and follows certain rules. To avoid plagiarism, paraphrasing must always indicate the source of the idea formulated. Scientific style: tips and examples Once the rules of scientific writing are applied, other methods can be used. Their application guarantees the use of an appropriate scientific style that is pleasant to read.

**1. Follow a logical progression**

It is important to make a logical statement. The reasoning must be structured and follow a clear and detailed progression. Each part can be introduced then summarized in a few lines so as not to lose the reader. The research question must be central and each part must be able to answer it. For this, the use of short sentences and spaced paragraphs is recommended, in order to optimize the readability of the text. The use of connecting words such as “besides”, “therefore”, “thus”, “firstly” and “secondly” expose the logic expressed by the researcher in his text.

**2. Use adequate vocabulary**

To maintain the reader's interest and ensure that they follow the reasoning, vocabulary is important. For this, it is not recommended to use overly “literary” language that uses a lot of metaphors or complex syntactic constructions. Depending on the type of magazine, it is necessary to adapt what you say to the reader. Indeed, in certain journals, the readers will be specialists in the subject while in others (popular journals or interdisciplinary journals), the reader will discover the subject. In this case, it will then be important to define the main concepts.

**3. Verb tense**

The present indicative tense is the tense most used in scientific articles. Narrative tenses such as the imperfect or the simple past are rarely used. The present guarantees the unity and sobriety of scientific statements and allows direct access to information.

**Errors to avoid**

Certain errors can hinder readers' understanding and harm scientific discourse. Among the main errors are the use of the first person, sentences that are too long and spelling mistakes.

**1. Giving your personal opinion**

It is often not advisable to give your personal opinion in scientific articles, except in the paragraphs dedicated to justification or interpretation. To avoid this error, impersonal forms and passive expressions should be preferred.

**2. Make long sentences**

In all scientific content, it is necessary to avoid length. These make the text unpleasant to read and can restrict access to information. It is better to avoid repetition: each sentence must provide information. Metalanguage is a common fault to avoid, because it lengthens sentences with information that is not very useful.

**3. Spelling mistakes**

Spelling mistakes can compromise the seriousness of the article and make it lose credibility. Proofreading is therefore an essential step! Most of the time, it is difficult to see your faults yourself. Indeed, after many hours spent on a text, habituation can make errors invisible to the author. The best solution is to have the content proofread by a third person (dissertation director, colleagues, etc.).

**Scientific writing checklist**

To help you, here are some points to check before publishing or submitting content to a journal:

\*Important concepts and acronyms are defined.

\*The text is regularly ventilated (paragraphs, subparagraphs).

\*If the article appears in a widely-read journal, important concepts and acronyms are defined.

\*No sentence is longer than three complete lines.

\*Diagrams, tables and figures have a detailed legend.

\*All citations and references in the text are listed in the bibliography.

\*The use of the first person singular (or plural if several authors) is especially present in the parts dedicated to interpretation or positioning.

\*The verbs are conjugated in the present indicative.

\*Citations, footnotes and references follow the style requested by the journal. \*The article has been proofread and has no spelling errors.

**6-Concepts and scientific articles**

**What is a scientific concept?**

A scientific concept is capable of fulfilling an operational function: discrimination function or judgment function, in the interpretation of certain observations or experiments. It is a tool for effectively understanding reality, a theoretical instrument for the interpretation of phenomena.

Scientific concepts refer to a set of interconnected ideas, theories, laws, models, and principles that explain natural phenomena, establish cause-and-effect relationships, and guide scientific research. These concepts are the building blocks of scientific knowledge and provide a framework for understanding the world around us. They are based on empirical evidence, logical reasoning and rigorous testing, and are subject to revision and refinement as new evidence emerges. For example, the concept of evolution explains how organisms change over time through the processes of natural selection, genetic drift, and mutation. It is supported by a vast body of evidence from fields such as genetics, paleontology, comparative anatomy and biogeography. Likewise, the concept of relativity describes how space, time and gravity are related and is supported by experimental tests and mathematical equations.

**Variables**

A variable is a value that changes depending on different factors. Some variables change easily, like stock values, while others are almost constant, like someone's name. Researchers often seek to measure variables. The variable can be a number, a name, or anything that has a potentially changeable value. An example of a variable is temperature; this changes depending on other variables and factors.

You can measure different temperatures indoors and outdoors. If it is sunny, the temperature is likely to be higher than if it is gray. Another thing that can change the temperature is an act done for this purpose, such as lighting a fire in the fireplace. In research, we generally define variables based on what we measure.

The independent variable is the one the researcher wishes to measure (the cause), while the dependent variable is the effect (or assumed effect), dependent on the independent variable. In experimental research, these variables are often stated in a hypothesis, e.g. "what effect does personality have on helping behaviors?"

**Operationalization**

With operationalization, it involves taking a vague concept, such as " "helping behavior", and to try to measure it through specific observations, e.g. the probability that people will help a stranger in a difficult situation.

**7-Citations in a scientific article**

Insert bibliographic citations as you write Bibliographic citations are inserted in the text each time you borrow an idea, a result from a document or when you cite a text in extenso — in the latter case, put the quoted text in quotation marks. They can be written in several ways (for review, see instructions for authors). **The simplest is to cite the author and the date of publication in parentheses: an author:** (Author name, 2023);

2 authors: (Name 1st author and Name 2nd author, 2023) — “and” or “and” depending on whether your text is in French or English;

3 or more authors: (Name 1st author et al., 2023).

If you are referring to several documents by the same author published in the same year, write: (Author name, 2023a); (Author name, 2023b).

**Examples by document types Journal article With pagination:**

Author1 I.J., Author2 K.L., Author3 M.N. Year. Article title. Title of the journal, volume (number): pagination. DOI link (or, if there is no DOI: Consultation date: URL)

Without pagination: Author1 I.J., Author2 K.L., Author3 M.N. Year. Article title. Title of the journal, volume (number): article number, number of pages of the article. DOI link

**Article with pagination:** Balde Alpha B., Scopel E., Affholder F., Da Silva F. A. M., Wery J., Corbeels M. 2020. Maize relay intercropping with fodder crops for small-scale farmers in central Brazil. Experimental Agriculture, 56 (4): 561-573. https://doi.org/10.1017/S0014479720000150

**Article numbered without pagination, inserted in a volume**

Dugué P., Kohio E. N., Tiemtoré J. 2021. Burkinabè agriculture facing the Covid-19 crisis: case of the regions of Yatenga and Hauts-Bassins. Cahiers Agricultures 30: 16, 10 p. <https://doi.org/10.1051/cagri/2021002>

**Book, report**

Author1 I.J., Author2 K.L., Author3 M.N. Year. Title of the work or report. Place of publication: publisher, pagination. (Collection name, number in the collection). ISBN. DOI link (or, if there is no DOI: Consultation date: URL) **Book:** Dubos B., Bonneau X., Flori A. 2020. Managing oil palm fertilization. Versailles: Ed. Quae, 87 p. (Savoir faire collection) ISBN 978-2-7592-3261-1. <http://doi.org/10.35690/978-2-7592-3262-8>

**Report:** Duteurtre G., Corniaux C., De Palmas A. 2020. Milk, trade and development in the Sahel: Socio-economic and environmental impacts of the importation of European MGV mixtures into West Africa. Report for the Greens and S&D groups in the European Parliament. Montpellier: Cirad, 74 p. + appendices. https://agritrop.cirad.fr/597139/ Book chapter, report Author1 I.J., Author2 K.L., Author3 M.N. Year.

**Chapter title.**

In: Generic author(s) of the work or report. Title of the work or report. Place of publication: publisher, chapter pagination. (Collection name, number in the collection). ISBN. DOI link (or, if there is no DOI: Consultation date: URL

**Book chapter:** Risède J.-M., Achard R., Brat P., Chabrier C., Damour G., Guillermet C., De Lapeyre de Bellaire L., Loeillet D., Lakhia S., Meynard C. , Tixier P., Tran Quoc H., Salmon F., Côte F.-X., Dorel M. 2018. The agro-ecological transition of Cavendish banana growing systems in the French West Indies. In: Côte F.-X., Poirier-Magona E., Perret S., Roudier P., Bruno R., Thirion M.-C. (eds.). The agro-ecological transition of agriculture in the South. Versailles, France: Ed. Quae, p. 149-179 (Agricultures and challenges of the world). ISBN 978-2-7592-2824-9. https://doi.org/10.35690/978-2-7592-2824-9 **Report chapter:** Freguin-Gresh S., Razafimahefa L., Pressoir G., Dhaïti L., Rideler P. 2016. Chapter 5. Situation and dynamics of agriculture in Haiti: proposal of an analysis tool to conceptualize and target “tailor-made” interventions. In: Van Vliet G., Pressoir G., Marzin J., Giordano T. (eds.). A comprehensive and strategic study of the Haitian agricultural/rural sector and the public investments required for its development. Final version – June 29, 2016. Convention CO0075-15 BID/IDB. Montpellier: CIRAD, p 196-247. https://agritrop.cirad.fr/580384/

**Congress communication, unpublished**

Author1 I.J., Author2 K.L., Author3 M.N. Year. Title of the communication. Number of pages. Name of the conference. Congress number, dates, city, country. Date of consultation: URL

**Presented paper:**

Chaïr H., Bhattacharjee R., Pavis C., Summo M., Cormier F., Arnau G., Lebot V. 2018. Greater yam (Dioscorea alata L.) pre-breeding and breeding : use of genomic tools to decipher the genetic diversity and identify wild relatives. [W971]. Plant and Animal Genomes 26, 2018/01/13-17, San Diego, USA. 2023/02/03: https://pag.confex.com/pag/xxvi/meetingapp.cgi/Paper/32066 **Communication by poster (poster):** Auzoux S., Marnotte P., Ripoche A., Schwartz M., Le Bourgeois T., Fayolle B. 2020. Capitalization, publication and analysis of data on the study of weeds in tropical cropping systems. Saint-Denis: CIRAD, 1 p. Scientific and technical committee of the DPP SIAAM, Saint-Denis, Réunion, November 19-20, 2020. https://agritrop.cirad.fr/597073/ **Congress communication, published** This is a journal article reference or book chapter to which the mentions of congress, that is to say "Name of congress. Number of congress, dates, city, country" are added.

**The Proceedings** are a work or report that brings together all of the conference communications. The reference of the work or report is then supplemented by the congress mentions. Communication published in conference proceedings, in a collection: Sagoua W., Ducamp M.N., Loiseau G. 2013. In vitro antifungal activity of neem oil against banana pathogens. In: Palupi Endah R., Krisantini Warrington I.J. (eds.). Proceedings of the fourth International Symposium on Tropical and Subtropical Fruits. Belgium: ISHS. p. 197-207. (Acta Horticulturae, vol 975). International Symposium on Tropical and Subtropical Fruits, 4, 2008/11/03-07, Bogor, Indonesia. <https://doi.org/10.17660/ActaHortic.2013.975.21>

**Communication published in a work of proceedings:**

Bonin M., Roche M. 2020. Analysis of the lexical fields of territorial actors from textual corpora on the web: the case of controversies surrounding aerial spraying against banana Sigatoka in Guadeloupe. In: TOTh 2019. Roche C. (ed.). Chambéry, Presses Universitaires Savoie Mont Blanc, p. 293-307. (Terminologica Collection). ISBN 9782377410477. TOTh 2019 - Terminology and ontology, Chambéry, France, June 6 to 7, 2019. Accessed on 02/03/2023 <http://toth.fr.condillac.org/actes>

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Soumaré M., Havard M. 2019. African cotton zones: dynamics and sustainability. Proceedings of the Bamako conference, November 2017. Bamako: EDIS, 506 p. ISBN 978-99952-56-98-2. International conference on the dynamics and sustainability of African cotton zones, Bamako, Mali, November 21 to 24, 2017. <https://agritrop.cirad.fr/593138/>

**Dissertation, thesis**

Author I.J. Year. Title of the dissertation. Place of publication: University, number of pages. Diploma (specialty). Date of consultation: URL Bruy D. 2018. Diversity, ecology and evolution of single-stemmed plants in New Caledonia. Montpellier, France: University of Montpellier, 329 p.

**Doctoral thesis:** Functional ecology and agricultural sciences. <http://agritrop.cirad.fr/593101>

Patent Inventor1 I.J., Inventor2 K.L., Inventor3 M.N. Year. Patent title. Patent number. Patent filing date.

Consultation date: URL Cardinault N., Dutoit Verhaeghe A., Mertz C., Brat P., Chillet M. 2019. Water-soluble extract of propolis, process for obtaining and use to prevent and/or fight against plant diseases. Paris, France: INPI, FR3069413. 2017-07-25. 2023/02/03: https://worldwide.espacenet.com/patent/search?q=pn%3DFR3069413A1 **Dataset Author.** Year of publication. Title. Version. Editor. Resource type. Identifier (DOI link) (if applicable: Consultation date: URL) Bourgeois T., Marnotte P., Auzoux S., Fayolle B. 2020. A Reference Weed Flora of the 30 tropical weed studies datasets. Version 4.0. CIRAD Dataverse. <https://doi.org/10.18167/DVN1/KHAEBG>

**Data Management Plan Author.** Year of publication. Title. Version.

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**Place of publication:**

Publisher. Scale or Pagination. Date of consultation: URLAtlas: Bourgoin J., Corniaux C., Touré L., Cesaro J.-D. 2019. Atlas of the dynamics observed in the Laiterie du Berger collection basin. Dakar, Senegal: CIRAD. 48 p. http://agritrop.cirad.fr/591173 Map: Dupuy S., Defrise L., Burnod P. 2019. Map of building development between 2003 and 2017. Agglomeration of Antananarivo. Montpellier, France: Cirad, scale: 1:50,000. <http://agritrop.cirad.fr/594286>

**Application, software**

Author. Year. Application name. (Application version). Place of publication: Publisher. Identification or certification number. Consultation date: URL Auzoux S., Martiné J.-F., Loison R., Poser C., Marnotte P., Goebel F.-R., Dusserre J., Rouan L., Adam M., Pot D. 2016. ECOFI: a new generic database to facilitate the modeling and analysis of datasets from agro-ecology experiments. Montpellier: CIRAD. Certification number:IDDN.FR.001.090030.000.R.P.2016.000.10300.https://agritrop.cirad.fr/581437

**Website, page or website article**

Author I.J. Year of update. Home page title. Date of consultation: URLWebsite: Cirad. 2020. Regepe. Genetic resources of perennial plants in Guyana. 2023/02/03: <https://regepe.cirad.fr/>

**Press article on the internet:**

Hiernaux P., Diawara M. O., Assouma M. H. 2018. In the Sahel, maintaining pastoral livestock to adapt to climate change.Paris :LeMonde.2023/02/03:https://www.lemonde.fr/afrique/article/2018/11/26/au-sahel-maintenir-l-elevage-pastoral-pour-s-adapt-au-changement -climatic\_5388932\_3212.html

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**8-Intellectual properties in the field of scientific research**

Intellectual property is the field comprising all the exclusive rights granted over intellectual creations. It has two branches:

\*Literary and artistic property, which applies to intellectual works, is made up of copyright and related rights;

\*industrial property, which itself includes, on the one hand, utilitarian creations, such as the patent of invention and the plant variety certificate or, on the contrary, a right of sui generis protection of plant varieties, and, on the other hand, on the other hand, the distinctive signs, in particular the commercial brand, the domain name and the designation of origin.

It includes a moral (extra-patrimonial) right which is the only right attached to the person of the author of the work which is perpetual, inalienable and imprescriptible, and which therefore applies post mortem, even after the work is placed in the public domain (i.e. 70 years from January 1 of the year following the author's death). It is the resulting work, and its form, which are protected, not the ideas and information which are at its origin, and which remain free of rights. Thus, the “summary” of a written work, or the citation of a title in a bibliography is not considered borrowing from what is copyrighted in the work. Some figures in the free software movement denounce the semantic fraud of the concept of "intellectual property", just as the recent patenting of life has sparked lively ethical and legal controversies.

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