

## Lesson:01

### 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?