



Inductive Or Deductive Reasoning in The Narrative of The Introduction of a Scientific Article: A Logical and Sequential Ordering

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Abstract

The objective of this short report is to describe and compare inductive and deductive reasoning in the introduction section of a scientific article as part of the research process. The purpose is to provide a reflection on the approach to reality in both methods, proposing criteria on the logical order and rationality of research.

Keywords: Deductive reasoning; inductive; scientific article

Introduction

The introduction is the section that places the reader in the context of the study. It indicates a route that allows understanding the problematic situation that gives rise to and justifies the research, provides knowledge regarding the subject in a contextual framework where the study problem is located, and allows to understand what is known and what is unknown about the subject to be treated, presents the questions or research questions, gives an answer to why the study is carried out and culminates with the objective or hypothesis of the work.

The introduction must present the most relevant background that gives the foundation to the research, defines the objectives and relevance of the study according to the problem, and keeps a sequential and logical evolution (fig 1), which guides the reader in the environment and allows to understand what it is and where it wants to go.

The introduction and understanding of the object of study

The relationship between the problematic situation and its connection with everything that gives meaning to the research itself is reflected in the section of the introduction. Not described in the introduction what the study is? Or why is it important? It creates a void not only for the reader but also for the reviewer [1].

Introduction and information for the reader

This section presents in an orderly manner the existing and updated works that relate to the subject under study. This allows the reader to understand in an orderly and systematic way where the research is going and the reason for the study. If the narrative is fluid and coherent it can allow the interested reader to engage with the research.

The Inductive approach to the introduction in a scientific article

There are methods whose main objective is the search for information and there are others that focus on the construction of knowledge [2] Its rational form and its particularities on the approach to the precision of the problem has as a characteristic the need to start from the knowledge of individual phenomena that allow generating generalizations that have an empirical basis. In the introduction section of a scientific article, I would start with the collection and presentation of particular data and then show generalizations through inductive reasoning. This form of work is supposed to limit subjectivism [3]

Limitations of inductive reasoning

All inductive reasoning starts from an absolute truth of the premises that will become in turn the truth of the conclusion [4] [5]. Therefore, reliability is doubtful. Even more, when in its conclusions it provides diverse information.

An inductive approach in the section of the introduction immerses the reader in a premise considered as a non-refutable truth. In successive indicative arguments, the spectrum is broadened to generalize the truth. Similarly, a suggested research question may be accompanied by bias and unreliable results.

Under the inductive approach, from the same section of the introduction, data, concepts or experiences are proposed. But, by recognizing that there are gaps in knowledge and that these gaps give rise to a research question to which feasible answers must be given through the objectives of the study, it achieves a disruption in the structure and ordering that would guide the future development of the entire process of a scientific study, and that is not present in an inductive reasoning.

The deductive approach in the introduction section of a scientific article

The argument of deductive reasoning in the introduction section is written in a logical order that a general premise evolves toward a highly specific conclusion (fig 2). The deductive discourse in the narrative of the section of the introduction allows, through a systematic investigation, to present a set of organized knowledge, which present characteristics that are inherent to the research problem but, which are presented taking into account the empirical reference that can guide the researcher and the reader on what has been done and what remains to be investigated.

Discussion

One of the great controversies in any research process is precisely the methodology used. The ways of visualizing the object of the research, the validity and structural design in the scientific method, and how reliable knowledge is produced that can be comparable or reproducible, is the fundamental objective to give a scientific response to any problematic situation.

While the deductive method explores and deduces theories and is closer to a logical structure, the inductive approach would begin with specific observations and its products would be broad presumptions. Since the section of the introduction is the opening of the narrative, it must be structured in such a way that it can induce the reader to nourish himself from the subject under study even to those who are not experts. The extended reasoning of the inductive approach is characterized by the fact that the truth of a premise does not guarantee the conclusion and its results may or may not produce knowledge [6]. The objective of all research is to obtain knowledge through the publication of clear and effective results [7] Being the section of the introduction the one that begins the development of the argument of general data that helps to understand the topic to be developed, is



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obliged to express in an expository narrative, clear and orderly research topic, strategy and objectives of the study.

Conclusion

Deductive reasoning that uses general principles to reach a specific conclusion has a logical structure that allows the reader to be more context-oriented. A section of the introduction that uses logical reasoning strategies, the inductive approach using particular premises to reach a general conclusion, can create in the non-expert reader uncertainty and lack of understanding of the subject under study. The introduction section should be a guide for the expert reader or not. For this reason, logic indicates that general premises that lead to the specific aspects of the subject must be exposed.

Conflict of interest

The authors express no conflicts of interest with each other or with any institution



Figure 1: Steps that logically must comply with the structure of an introduction



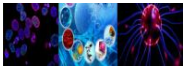
Figure 2: Deductive reasoning and obtaining scientific knowledge

DEDUCTIVE	INDUCTIVE
There is a theoretical-observational link	Knowledge through isolated information
Inferences are made from existing knowledge	Inferences are made from a truth considered infallible
It goes from the general to the particular or specific	Part of the specific that leads to generalizations on the subject
The conclusion is the product of diverse experiences	The conclusion is emanating from a truth considered absolute but, which may be questionable.
The reader is led in the narrative through the premises to reach an understandable conclusion	The reader is introduced to a conclusion and after observing all examples is placed in the context

Table 1: Comparison of deductive and inductive reasoning

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