

## Challenges In The Path Of Scientific Methodology And Research

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### Abstract:

The main objective of this work is to diagnose the reasons for the difficulty in learning Scientific Methodology and Research, especially at the undergraduate level. The greatest challenge is to organize knowledge and seek alternatives in the face of the problem of teaching scientific methodology and research, seeking strategies that can be used to improve the teaching of the discipline, in view of the difficulties presented by academics. After questioning through field research, the data were collected through descriptive and analytical statistics to conclude the research. We can see through the results that the difficulties exist, but that alternatives were suggested and that may contribute to alleviate the problem, the challenges of graduation. We cannot only professionalize academics but train them in the exercise of thinking and overcoming difficulties, opening possibilities and showing the need to move towards understanding and valuing science. This way of seeing and learning Scientific Research Methodology may contribute to a greater performance of teachers who are responsible for their teaching, obtain a better acceptance of the subject by students, not always very receptive and may, finally, provide a dynamic aimed at effective and integrative teaching. We do not have the pretension or the knowledge to dictate the rules, to point out solutions, only the desire to suggest that they get closer to the problem, to the difficulties in search of scientific knowledge.

**Key Word:** Science; Knowledge; Challenges; Higher education; Research.

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### I. Introduction

Many scholars have debated the definitions and purposes of scientific methodology and research. In an etymological sense, methodology means the study of the paths, the means of a scientific theory. What is discussed then are the paths, the framework of the theory and not its content itself. Thus, "when talking about methodology, we seek to analyze the way of structuring knowledge that is intended to be recognized as scientific" (Demo, 1981). Thus, in a restricted sense, the methodology has as its main task to demarcate what is and what is not a scientific production, offering criteria and parameters for the elaboration of projects and research. In a broad sense, the methodology enables critical and self-critical questioning of doing science. From the methodological analysis, it is possible to infer what can be said about what was studied, at what level of generalization, depth and extension, and what is not appropriate, given the path taken in the research. Through its examination, it is possible to reconstruct the choices made by the researcher and from there also to criticize his explanatory hypotheses.

To develop the discipline of Scientific Methodology and Research in higher education is to systematize important references verified throughout the process, regarding the relations of academics with this field of knowledge. It also enables the evaluation of pedagogical practice, since the aspects evidenced can be shared and still constitute valuable clues for improvement.

The current proposals for teacher training show the importance of progressively ensuring specific places in educational institutions for the improvement of pedagogical practice. Particularly, the thematization of practice is considered, a moment in which the teacher focuses on the object of study in question, which is his pedagogical practice in the daily life of the classroom. The reflection formalized in this work approaches a situation in which the teaching work is analyzed, questions are answered, and interventions are produced. The updating of pedagogical practice requires the construction of new knowledge even to be able to respond and interpret the challenges of the present reality, but it is also necessary to consider the permanent revision of this knowledge, which is being satisfactory and what needs to be changed in the reflection on practice. The parameter of this evaluation is undoubtedly the students' learning, a priority objective of the educator's task.

From this perspective, it should be proposed to share questions, considerations, challenges, problems, anxieties and desires that have been manifesting themselves in the classroom with higher education students. It becomes very clear that the greatest challenge is to organize knowledge, in the perspective pointed out by Morin (2001, p.36) "Knowledge of information or isolated data is insufficient. It is necessary to situate information and data in their context in order to make sense."

Right at the beginning of the course, it is customary to ask students to record through a written production their expectations regarding the discipline Scientific and Research Methodology. The results of this consultation have been worrying they show little interest in understanding science and learning how to do research, improve their reading, learn new study techniques, know how to write good texts and, above all, better understand theory.

Relating this study as a theoretical basis to freshman academics is a necessity. Based on the results obtained in this consultation, it is proposed to deepen the readers, inviting them to use the proposed concepts as a serious discussion on the subject for improvements in their learning.

The teaching of scientific methodology and research should develop in the student the desire for knowledge. Working with disciplines that have a more technical characterization, such as Methodology, requires a lot of creativity from the teachers in charge to make the classes interesting in the eyes of the academics, on the other hand, a lot of commitment is required. In practice, this means that the educator has to present theoretical knowledge and, preferably, carry out actions in which this new knowledge is experienced. To mobilize the students and make the classes pleasurable and thought-provoking, it is the responsibility of the educators to know the theme studied very well, to be able to promote activities that are significant in terms of the usefulness of new knowledge in social practice and to be able to change the thinking inherited by them. It should also enable a basic theoretical foundation in relation to research practices.

To achieve this object of study, strategies based on the project method will be developed, presenting the problem-situation to the students. Learning and teaching Methodology cannot be limited to an activity distant from pedagogical praxis, nor can apathy in relation to it be ignored, otherwise our role in the classroom will only be to demand compliance with norms that are not understood. An analysis can also be made, what can be changed regarding the lack of a more practical vision in teaching didactics?

So far it is clear that there are few research in this line of knowledge, in this case this is a way of contributing to the advancement of science with its publication.

## **II. Material And Methods**

The methodology of this article was structured in two main stages: a literature review and empirical research with students. The objective was to investigate the challenges faced in the development of scientific methodology and in conducting research.

The bibliographic search was carried out in CAPES journals. Establishing as inclusion criteria: articles published in the last 10 years, which address the theme of scientific methodology and challenges in research. For the search, the following keywords were used: "scientific methodology", "research challenges", "research methodology", "teaching methodology".

Initial filtering of the results was performed to ensure relevance and quality of the selected articles. This was followed by the reading of the abstracts to identify the articles that meet the criteria and detailed analysis of the selected articles, focusing on the challenges reported and the proposed solutions.

The second stage was field research with 171 randomly selected higher education students. Those students who already had contact with scientific methodology disciplines and have carried out or are carrying out academic research are included. Two questionnaires were used, one with open questions and the other with open questions to cover the qualitative scope of the study.

## **III. Result And Discussion**

### **The construction of knowledge**

Much has been discussed about the importance of knowledge, attributing to it a considerable portion of contribution, as it implies a conscious effort to put within the reach of the new generations the elements

necessary for updating, information, work techniques and cultural values, thus promoting numerous changes and the improvement of humanity in general.

Michel, (2005) points out that:

Knowledge covers all areas of knowledge accumulated by humanity, from Classical Antiquity to the present day. It should always be considered unfinished, never completely conclusive, while new research may revise and revolutionize concepts, creating new knowledge, deepening current knowledge and even denying existing ones (p.21).

Since the dawn of humanity, human beings have sought or have already sought to understand their existence or at each moment of their life, with each new fact, they have always conducted their existence to improve their quality of life, always looking for new ways to overcome themselves.

Being or being born with the investigative intent, this individual, over time began to understand himself and the facts that surrounded him and realized his differences between animals, seeing that he himself changed his habits and animals did not. Another factor of great relevance is his self-knowledge, also until then it was domination, which in the beginning man was dominated by animals, through force, then he began to dominate them through his intellectual development.

From this determinant, he then began to feel more valued, already realizing his own overcoming.

For Aranha, (1993):

While the animal always remains the same in its essence, since it repeats the gestures common to the species, man changes the ways in which he acts on the world, establishing relations that are also mutable, which in turn alter his way of perceiving, thinking and feeling (p.05).

At every moment, with the continuous challenge of being able to evolve, he began to realize that he would only be a totally strong individual if he somehow registered his evolution, not only in his subconscious, but in another way. A way that others could perceive this evolution, where it would give an alternative of divergence of ideas and standard of quality of life. Each one should look for an alternative, that is, create new ways to be able to overcome the other. With this need and purpose, this individual then, increasingly updated, invented several alternatives to be able to increasingly surpass himself. Organizing his knowledge through meditation and observation of his peers and himself, science is born, the product of long processes, from which through daily life, going through its mishaps and difficulties, he has found benefits.

This way of constantly updating and registering your product arises, observing your records requires you to produce more and more, because only those who create new alternatives for survival always have sustainability, because the human being is endowed with the ability to know and think, and knowledge is necessary for the progress of man.

According to Bochensky (1961) apud Cervo and Bervian (2006, p.07):

Our possibilities of knowledge are very and even tragically small. We know very little, and what we do know we often know superficially, without much certainty. Most of our knowledge is only probable. There are certainties, unconditional, but these are rare.

In the process of knowledge, the subject appropriates the known object. Through knowledge, man penetrates the various areas of reality to take possession. In this way, it can rise to situate it in a more complex context, in short, its fundamental structure with all its implications.

### **The production of knowledge**

Education that aims to transmit knowledge cannot be blind to what is human knowledge, its devices, illnesses, difficulties, tendencies to error, but rather that it is concerned with making known what it is to know.

Knowledge cannot be considered a tool, which can be used without its nature being examined. In the same way, knowledge of knowledge must appear as a first necessity, which will serve to face the risks of error.

It is necessary to introduce and develop in education the study of the mental and cultural characteristics of human knowledge, of its processes and modalities that lead it to error.

Education must show that there is no knowledge that is not, in some degree, threatened by error. Knowledge, as a word, idea, theory, is the result of a translation/construction through language and thought and, therefore, is subject to error and involves interpretation, which introduces the risk of error in the subjectivity of the knower, his worldview and his principles of knowledge.

"The scientist does not understand science as a fixed and definitive point of arrival, but as a path, as a process in constant evolution." (Ruiz, 2002, p.135). Knowledge is the main factor of innovation available to human beings. It is not only a renewable resource, it grows while it is exploited and is not made up of static truths, but a dynamic process, which accompanies human life, being a guide to action.

Thus, the ability to learn, to develop new patterns of interpretation and action, depends on the diversity and nature of knowledge. Competence, in this context, is understood in the sense explained by Philippe

Perrenoud (1999) who mentioned that it is a competence, a know-how. It is, therefore, not a technique, but some knowledge.

To understand part of the dynamics of the functioning of knowledge production, it is relevant to study the point of development in which we find ourselves and the progress that preceded it. As much as questions and interests arise in the production of knowledge, making it to a certain extent partial, it is necessary to double efforts to reduce interference. Perhaps, in this case, the speed for development has an adequate rhythm, respecting each person.

There is this reality about the production of knowledge to manage, raising important reflection on educational institutions, which are crucial for the formation of the human being. It is an arduous task and requires a lot of commitment. The educator has the responsibility to provide students with a discussion about the limitation with which they live. "To study the problem of truth is nothing other than the analysis of the relation of conformity of human thought with its object of knowledge." (RUIZ, 2002, p.115).

This production makes it possible for the university to collaborate to improve the environment and expand its participation in the political process of society. What is proposed is, in addition to the attitude of permanent study, a review of the role of educational institutions, so that they get as close as possible to the construction of knowledge that is democratic in its elaboration and use. Transformations bring with them pain and anxiety, which we must deal with. Transforming society is an audacious goal that needs to be met by the objectives of improving the quality of life.

A stage of knowledge production is Research, which consists of an inquiry or search to ascertain reality, or a systematic study, to discover or establish principles about a certain field of knowledge. In essence, this research investigates the relations between communication and linguistics, a science that studies the functions of language. In practical terms, the research points to a methodology to configure information stocks, digital libraries or virtual information centers in quality zones for the receiver. In theoretical terms, the research indicates the conceptual bases to facilitate the interaction between a receiver.

### **Knowledge and its levels**

Man is the only being capable of understanding or seeking other meanings about the concrete realities with which he is confronted and which he absorbs, he is the only one capable of learning about the derived relations, of comparing, analyzing, asking, separating elements and transforming.

Ruiz, (2002):

The human being is endowed with the capacity to know and think. Knowing and thinking are not only a capacity, but also a necessity for man, for his survival. Knowledge is necessary for man's progress (p.89).

The boundary between knowledge is not very rigid: everything has its importance, because one often needs the other. Consequently, every form of knowledge is valid, and, for an attentive researcher of the social, often a knowledge that may seem commonplace and unimportant, can serve as a starting point for a very interesting study. "Human history is the history of the struggles for the knowledge of nature, to dominate it, to interpret it." (Ruiz, 2002, p.90).

The act of knowing arises simultaneously with the transmission through education of the knowledge accumulated in each culture. Over time, human reason acquires new ways of thinking, according to the contact that man has with the world around him.

Thinking cannot be separated from acting. Thought itself becomes the object of thought. A phase of self-reflection and criticism of the knowledge previously received is installed. Cervo (2006):

Knowledge always implies a duality of realities: on the one hand, the knowing subject and, on the other, the known object, which is possessed, in a certain way, by the knower. The known object can sometimes be part of the subject who knows. You can know yourself; you can know yourself and think your thoughts. But not all knowledge is thought. Thought is intellectual activity (p.07).

### **Empirical Knowledge**

Based only on experience, on practice, and not on study or science. Also called common sense, vulgar or commonplace knowledge. It is acquired without studies, research, reflections or any application of methods, so it is based on knowledge obtained in everyday life, at random, without questioning.

It is incorporated into the life of the population and this knowledge becomes part of the cultural tradition of a people, being passed from generation to generation. Cervo, (2006 p.08), "each one uses the experience of the other, sometimes teaching, sometimes learning, in an intense process of human and social interaction. Through collective experience, knowledge is transmitted from one person to another, from one generation to another".

### **Philosophical Knowledge**

Characterized by the effort of reason to question human problems and to be able to discern right and wrong. Therefore, he seeks the truth about the phenomenon, and this is reached by the rational, who seeks to understand reality in its most universal context. Its starting point is the hypotheses that cannot be submitted to experimentation, which is why it is said that it is unverifiable knowledge, that is, it cannot be confirmed or refuted.

It does not present definitive solutions, but it enables man to make use of his faculties to better see the meaning of concrete life. Its objective, according to Fanchin (2003, p.7), "is the functional development of the mind, seeking to educate reasoning".

According to Cervo, (2006):

Philosophical knowledge is distinguished from scientific knowledge by the object of investigation and by the method. The object of the sciences is the proximate, immediate data, perceptible by the senses or by instruments, since, being of a material and physical order, they are therefore susceptible to experimentation. The object of philosophy is made up of immediate realities, imperceptible to the senses and which, because they are of supersensible orders, go beyond experience (p.10).

### **Theological Knowledge**

It is the one that deals with truths and principles, often without proof, but which become dogmas and are accepted without question. It is religious knowledge, acquired from the sacred books and accepted by men. It is related to faith and divine belief, based on a God, which can be Jesus Christ, Jehovah, Buddha, or any other divine authority.

Therefore, this knowledge has no rational foundation, logical or scientific support, it is based only on the attitude of faith and mystery, becoming a set of truths, which come to man not as the aid of his intelligence, but through an acceptance moved exclusively by faith (Cervo, 2006):

Knowledge revealed – concerning God – and accepted by theological faith constitutes theological knowledge. This, in turn, is the set of truths that people have arrived at, not with the help of their intelligence, but through acceptance of the data of divine revelation (p.12).

### **Scientific Knowledge**

It is characterized by the ability to analyze, explain, unfold, justify, induce or apply laws, to predict future events with certainty.

This type of knowledge is concerned with the systematic approach to phenomena, considering that it is necessary to show their cause and effect. It is based on general principles valid for all cases, based on the most extensive experiments already made, presented in theoretical form until they are verified, modified or abandoned according to new discoveries.

Initially, the scientific or experimental method is applied in the physical and biological sciences, previously called exact, since its knowledge is based on research that presents studied and proven data because they are liable to be repeated or verified, if they are in conditions similar to those that originated them, usually in specific environments for such experiments, such as laboratories.

In the social sciences, on the other hand, the research does not present this same possibility, since it is based on a scenario in which a web of relations constituting the social phenomenon that cannot be repeated is processed, and this whole set of interrelations is what will be the object of interest of study in Sociology.

While the physical or natural sciences took more than four hundred and fifty years to develop, since their studies and investigations began to present a scientific basis through data that prove the origin of what is being investigated, the social sciences, engaged in research on human behavior and its derivations, are more recent and date from the middle of the twentieth century. However, science aims to move away from the frontier of the unknown and its interest is to increase knowledge about what already exists, discover new phenomena and improve research methods, to improve the knowledge of these same phenomena.

According to Hegel apud Michel (2005, p.20):

The investigation of the knowledge of any object or phenomenon can only occur by knowing; To investigate this so-called instrument means nothing other than to know it. But wanting to know before knowing is as incongruous as the wise resolution of that scholastic – to learn to swim before venturing into the water.

Scientific knowledge can serve as a path for the construction of knowledge, in a constant challenge of intellectual creativity. As the work progresses, the challenge increases in the search for theoretical information. It is a search with challenges and risks, because it opens space and you must make decisions, choose.

### **The importance of research**

"Research is the set of intellectual activities aimed at the discovery of new knowledge". Saavedra; Monteiro, (2001, p. 61). Research presupposes a thorough study to promote training, knowledge, development of skills and a taste for reading and research, as well as teamwork, improving data, verifying and expanding new information. It creates an exercise in dialectics, logic, discussion and argumentation, generating the ability to let creative inductions flow. It exercises the activity of writing, as well as the correct use and application of the language. It also serves to discover answers to intriguing questions.

And finally, it allows the generation of new knowledge, transforming the individual into an agent of his own development, with a change in attitudes. According to Voltaire apud Michel (2005, p.31):

Perhaps the day will come when man knows, in advance, if it will rain or if a time of drought will come; and he will know, moreover, how to contain lightning. To get to such a point, it is necessary to study, rationally, it is necessary to nourish our mind, it is necessary to cultivate our garden.

When the researcher begins his research, he will intervene in the reality to be researched and gather information to locate the research problem. The main purpose of research is to explore, study, understand the world, recording, analyzing, interpreting and identifying data. For Ludke, (1986):

After organizing the data, in a process of numerous readings and rereading, the researcher can re-examine them to try to detect more frequent themes and themes. This procedure will culminate in the construction of categories or typologies. (p.42).

These categories are modified in a process of interaction between the theory and the data collected, but for this it is necessary to go beyond what is written. This research should have feedback to the schools heard, thus avoiding a utilitarian posture of the researcher, often without giving due feedback. Transparency is the keyword, because within the action, one can plan, producing ideas that anticipate reality. This conception must be conscientizing and there needs to be a transformation of pedagogical praxis.

### **Higher Education in Brazil**

When referring to the beginning of higher education in Brazil, there are several ways to understand its evolutionary difficulty. First, citing the form of Brazilian colonization, where the Europeans who arrived here were mere itinerant individuals who only sought riches and some novelties existing in the new world. Another interesting fact is that the Brazilian, if compared to the natives of other regions, such as, for example, Spanish America itself, was much less evolved, both in terms of writing and architecture. Starting from these two factors, one understands some of the difficulties encountered to date in our universities.

How could Brazil be a highly developed country, if in its roots, that is, at the beginning of its colonization, there were already difficulties in the relationship between the people who arrived here, because the natives, in addition to not having an interest in development, also had no knowledge for the evolutionary and intellectual construction.

Knowing then the great difference between the Portuguese nation that colonized Brazil to explore it and the Spanish nation that colonized Spanish America to populate it, the different current realities are perceived.

"Brazil occupied the most primitive levels of the civilizational scale, living in nomadism and in pre-written culture, with a strong mark of social disorganization" (Souza, 2004, p.07).

Thanks to the religious orders, as well as with great zeal for catechesis and perhaps for the human respect of educating itself, Brazil has had a long historical period in terms of education. The Jesuits were responsible for laying the foundations of a vast educational system, which developed progressively with the territorial expansion of the colony. For two centuries, they were almost the only educators in Brazil.

The needs of colonial expansion inspired the few and scattered educational initiatives. The then emperor of the time, feeling threatened by invasions from other peoples, began in a very remote way to encourage higher education, as he needed professionals to build fortresses to defend himself from his enemies. From the expulsion of the Jesuits in 1759 to the transfer of the Portuguese court to Brazil in 1808, education in the colony went through a period of disintegration and decadence.

However, with the arrival of the Prince Regent, D. João VI, the educational policy that the Portuguese government adopted in relation to Brazil was modified. Several educational and cultural institutions were inaugurated. The first higher education courses appeared: schools of law, medicine, engineering, but not universities. The basic levels of education, however, continued to be ignored.

Educational policy began to change after the First World War, when a generation of great educators emerged, such as Anísio Teixeira, Fernando de Azevedo, Lourenço Filho and Almeida Júnior. Different education reforms in the states date from this period. The Manifesto of the Pioneers of Education of 1932 synthesized this movement, explaining the central points of a broad reform of national education and had a powerful influence on all subsequent orientation. The creation of the first Brazilian universities dates to the 30's and broad reforms of education at the other levels, which were important despite the bureaucratic inspiration that guided them, resulting from the implementation of an authoritarian regime.

The democratization that followed the Second World War led to a new reformist impetus, of a more popular nature. At that time, an admirable movement in favor of public, universal and free schools emerged, which had direct repercussions in the National Congress and culminated in the enactment, in 1961, of the Law of Guidelines and Bases of National Education, after a difficult trajectory that lasted 13 years.

With the installation of a new authoritarian regime in 1964, the popular debate cooled down, but government action promoted a considerable expansion of the education system, including higher education. Agencies are created to support research and graduate studies. Compulsory education is extended from four to eight years. Some fundamental laws were enacted, such as 5.540/68 and 5.692/71, which introduced important changes in the different levels of education and remained in force today.

The 1988 Constitution, promulgated after a broad movement of democratization of the country, opens a new period. The responsibilities of the Government regarding education are considerably expanded, giving rise to the new reform movement that is currently underway. With the advent of the new Constitution in 1988 and the enactment of the Law of Guidelines and Bases of National Education at the end of 1996, new perspectives were placed and dreamed of for Brazilian society.

For Rui Leite Berger F<sup>o</sup>, (PCN'S):

We had a decontextualized, compartmentalized teaching based on the accumulation of information. On the contrary, we seek to give meaning to school knowledge through contextualization; avoid compartmentalization through interdisciplinarity; and encourage reasoning and the ability to learn.

The reconstruction of a quality, equitable and efficient educational system has brought new and constant challenges. Expansion is necessary, but with a minimum of planning; equity – a great challenge, as inequalities are enormous; quality - main objective and adequacy - imperative for the system to respond to the aspirations, needs and desires of Brazilian society, represented by the thousands of students who knock on the doors of the University looking for training and information. For Dias, (2000):

The university must be attentive to the indispensable need to promote citizenship, the public sense of social construction and personal autonomy, the values of cooperation and solidarity and sociality. That the school is not the only one, but in a special way that "social space in which individuals, as individuals, can begin to equip themselves with a community" (p.42).

A country cannot aspire to be developed and independent without a strong higher education system. In a world where knowledge surpasses material resources as a factor of human development, the importance of higher education and its institutions are increasing, so that they can perform their educational, institutional and social mission, also emphasizing the role of grounding and disseminating the knowledge taught at other levels of education.

Thus, not only on the part of the university, but also on the part of other institutions of higher education, there must be not only a close articulation between this level of education and the others, but also a commitment to the Brazilian educational system.

In the face of these new trends, the university must be aware of acting knowing that it is no longer the only training agency, as the global and national scenarios and perspectives point to new times and new challenges.

### **Research Methodology**

Methodology can be understood as a path that is traced to achieve any goal. A path that uses scientific procedures, standardized criteria accepted by science. and, therefore, it is a way, a way to solve problems and seek answers to needs and doubts. For Demo, (1983):

Methodology is an instrumental concern. It deals with the ways of doing science. It takes care of the procedures, the tools, the paths. The purpose of science is to treat reality theoretically and practically. To achieve this end, several paths are taken. This is what the methodology is about. (...) Only the professional methodologist makes it his *raison d'être*, especially the philosopher of the theory of knowledge. But for the scientist in general, it is only an auxiliary discipline.

Methodological knowledge is required, and the most important thing is that she can give the answers about what is proposed. In the term methodology there are numerous forms of knowledge. It can be said that it deals with scientific knowledge, scientific methods, research techniques, research projects, structure and preparation of scientific reports, structure and preparation of monographs, statistics applied to research, scientific theories and models, problems, themes, hypotheses and variables, scientific communication works, typology of knowledge, classification of sciences, graphic aspects of scientific works, planning of research and works technical standards for papers and for scientific writing. This means that scientific communication, to be valid, presupposes knowledge and mastery of scientific methodology.

### **The importance of the Methodology**

The discipline of Research Methodology in universities should help students in the experience of feeling like citizens, free and responsible, to manage their emotions and exercise common sense and equity, always seeking a progressive motivation, which moves a person and puts him into action Bzuneck, (2000):

The metaphor of personal investment seems to contribute additionally to understanding what motivation is. Every person has certain personal resources, which are time, energy, talents, knowledge, and skills, which can be invested in a certain activity. This personal investment will fall on a chosen activity and will be maintained if the motivational factors are at work. (p.10)

In a peculiar way, motivated students get rich when they assimilate everything exposed, leave college full of theories, ideas to revolutionize the job market, take them to record levels of profit and efficiency; accumulate theories from the most renowned specialists. They are often faced with the question of method. Where to start? Which is the first one that is now given? What is more urgent? There is a great difference between theory and practice, even though they are interdependent. Both seek to achieve the proposed objective; theory can generate and give shape to practice and vice versa.

The importance of Scientific Methodology for academics consists, above all, in the qualitative leap that such a practice can trigger, that is, in learning to be. For Libânio, (2002):

It is believed that the academic-scientific world is a primer - a little more elaborate. Assimilating in the daily life of not only the methodological rules of ABNT and its infinite exceptions and peculiarities, aiming to elaborate a scientific work of excellence, implies advancement, transforming the same cold and intellectual rules into habits that integrate the person, then one learns to be. To overcome the temptation to measure everything in terms of efficiency and interests and to replace quantitative criteria with the intensity of communication, the dissemination of knowledge and cultures, mutual service and good harmony to carry out a common task (p.85).

This way of seeing and learning Scientific Research Methodology may contribute to a greater performance of the teachers who are responsible for its teaching, a better acceptance of the subject by the students - not always very receptive, and may, finally, provide an interdisciplinary dynamic with the other subjects aiming at an effective and integrative teaching.

### **Methodology and Didactics**

The Methodology consists of the set of techniques and theories to collaborate in teacher training and research. Interconnected with the Didactics of Teaching, it carries out concepts and indicators that transform vision and reasoning in the formation and analysis of the Scientific Project.

Teaching Didactics is interconnected with techniques and methods as *knowledge and knowledge* are transferred to future generations, changing and increasing experiments in the continuous evolution of science. On the other hand, while not failing to recognize its specificity and its space of relative autonomy.

The methodological problem does not refer to a school, course or teacher, on the contrary, it is a problem that permeates the entire educational system, since there is a long tradition of passive teaching, disconnected from life. In other times, this type of teaching was even supported; Today, with the growing transformations of the contemporary world, there is a deep questioning and rejection by the new generations.

It is observed that the conception of knowledge is only one of the elements that interferes in the teacher's practice. The fact that the teacher has a more elaborate theory of knowledge does not necessarily mean that his practice will be coherent, as a function of other determinants of pedagogical practice, which must necessarily be considered.

It is then considered that the educator, to carry out a methodological transformation in the classroom, needs this reference that guides him in the integration with the contradictions and the development of practice. However, it is necessary to differentiate the role of the University in scientific research and practice, which must be exclusively close to academic models, training mainly scientists in its rich laboratories.

### **Challenges in learning the Methodology**

The study of Scientific Methodology in universities is rarely well accepted by students. The crucial questions arise from why and why to study so many rules, so many details, rigid indications for typing and formatting the text, which seem to restrict the student's freedom to think and write without any methodological requirement.

In a world marked by haste, lack of time, the ticking of the clock, talking about discipline and method is desperate. They get used to a necessary and exacerbated activism, to act like mechanized robots, to copy ideas and postures and to leave aside one of the greatest human riches, which is the ability to think and reflect.

To reflect on what one does is to put oneself in the circle, it is to let oneself be known, it is to expose oneself – which we do with great difficulty, since, as professors of higher education, we are accustomed to processes of planning, execution and evaluation of activities in an individualistic, individualistic and solitary way (PIMENTA, 2002, p.113).



The first challenge of the Scientific Methodology discipline is to rescue in our students the ability to think and reflect. This means moving from a spontaneous, first, and immediate level to a reflective, second, mediated level. For Libânio, (2001): "Thought thinks thought itself, in order to better capture it, to distinguish truth from error. You learn to think as you know how to ask questions about what you think." (p.39).

A second challenge to be achieved by Scientific Methodology is to learn the art of reading, analysis and interpretation of texts, extinguishing the phenomenon of the student-copyist, who reproduces in his research and academic works what others have said, without any value judgment, criticism or appreciation.

It is known the difficulty that the reading of a text presents in relation to the interpretation of an author, its real intention. Severino, (2002): "A text is a world open to be read and interpreted, and precisely for this reason the language text signifies, first of all, the intermediate medium, through which two consciousnesses communicate. It is the code that encrypts the message." (p.49).

And a third challenge that guides the teaching of Methodology is to learn how to do, which means placing oneself in a historical movement in which the present continuously assumes a critical instance in relation to the past (Libânio, 2002):

Learning to do by capturing the ethical side of all human action implies a sense of responsibility, because the more care in envisioning the future in present acts, the more one learns to do. Learning to do and think is not a privilege of intelligences. Great geniuses got lost in the cornering of their fragmented knowledge, developing experiments that ended in harmful products for humanity. It is not possible to understand the investment of intelligence in the research of weapons of death, except because these people have never learned to think and do (p.43-47).

It can be seen, therefore, that the Methodology aims much more than to lead the student to face these challenges and develop projects, to develop a monographic work or a scientific article as a final and conclusive requirement of an academic course. It can lead the student to communicate in a correct, intelligible way, demonstrating structured, plausible and convincing thinking.

The method, when incorporated into a form of work or thought, leads the individual to acquire habits and attitudes towards himself, the other and the world that only benefit his professional, social, affective, economic and cultural life.

By method one can understand the path that is followed to achieve a certain end, to achieve a goal; For the Greek philosophers, methodology was the art of directing the spirit in the search for truth. The rules and methodological steps taught at the university, aiming at the insertion of the student in the academic-scientific world - which are pertinent and necessary - also aim, and above all, to create habits that will accompany him throughout his life, such as the taste for reading, the understanding of the different interlocutors, a mature and responsible critical spirit, the clear and deep dialogue with others and with the world, self-discipline, respect for otherness and the different, a posture of humility in the face of the little that is known and the infinity of existing knowledge, the exercise of ethics and respect for those who think differently, the boldness/courage to expose one's own thinking.

### **Learning difficulties**

It is perceived that there are many learning difficulties for students in the discipline of Scientific Methodology and Research, due to the mistaken idea they have of research, considering the model adopted in basic schooling, the pure reproduction of sources, or even due to insufficient reading practice and interpretative construction capacity. However, a contribution that is evaluated as fundamental in this issue is the collective work among teachers to make the necessary regulations, contributing to the advancement of the knowledge under study, studying more and better, teaching how to make a summary, file, review, article, monograph, in short, that in a short period of time students learn all this.

It is understood that there is a need to consider that the content of Scientific Methodology and Research must be known and mastered by all teachers, because if they want the student to produce an article, it is up to them to guide them for this task and not to hold the Methodology teacher solely and exclusively responsible as if this activity were his or her responsibility alone.

The difficulty in working with the discipline of Scientific Methodology and Research, with good acceptance by academics, has been shown to be a problem to be analyzed. Through research, it is sought to find alternatives to arouse their interest and thus realize the importance of the discipline in undergraduate courses, as the greatest difficulty encountered is precisely the inattention and apathy in relation to the content worked.

The reason for the pretense of analyzing the problems formulated is due to the understanding of the advanced complexity in which it is found, and which needs to be seen and understood. It is intended to be coherent with another look at doing science and education, that is, it is intended to join the knowledge that, while constructed, will guide the praxis we want, the praxis that accounts for the problems, problematizing them and calling those involved to present solutions that are coherent with the reason that is investigated, which is the communicative reason.

Among the problems commented on, it is verified that the biggest problems in the teaching of the discipline is the object of our research are: problem of professional choice, fear of the future, conceptual problem, problem of level of demand and negotiation, muteness in the classroom, face-to-face problem, night teaching, reading habit, textual production, evaluations, exhibitions, responsibility, professional ethics, complexity, interlocution, creativity, information and theoretical basis, and also the problem of time and space.

Learning and teaching Scientific Methodology cannot be limited to an activity distant from pedagogical praxis, nor can apathy in relation to it be ignored, otherwise our role in the classroom will only be to demand compliance with rules that are not understood, as well as to ask students for something that is not done. such as, for example, the exercise of written reflection. Michel, (2005):

Writing is not an easy task; but it can become pleasurable, as well as contribute significantly to enabling communication. Although common sense may lead to the idea that writing well is an art, everyone who has ventured into this area knows that the written expression of thought requires, less than inspiration, a lot of perspiration, effort, investment. Writing well requires care, study, knowledge of resources and mastery of the facts of the language. Learning them and using them correctly, orally or in writing, is a basic competence for learning any other science, another subject and for the full exercise of citizenship (p.75).

Teachers cannot help students overcome their ignorance if they do not permanently overcome theirs, because you cannot teach what you do not know, what you have not learned. What legitimacy do you have, then, to request a scientific article, when you can't write a single line, you don't have intimacy with the publication? Questions like this dialogue daily with practice, question what to do and have certainly helped to teach better.

**Listening to and learning from academics**

After organizing the data, in a process of numerous readings and rereading, one can examine the opinions. Data and even ideas then emerged, which will certainly allow advances. These advances, to go further, it is necessary to capture the content, unveiling implicit messages. The theoretical framework will help in this journey.

This research is of great value and seeks to avoid that utilitarian posture of the researcher who only "uses" the institutions and their components without giving them the proper return. Transparency is the key word, because in a conception of knowledge that is also action, we can conceive and plan research whose objectives are not limited to description or evaluation.

In the context of the construction of the education system, it is not enough. It is necessary to produce ideas that anticipate the real or outline an ideal. In other words, it is not only an intellectual craft that is sought, there is a need for a transformative praxis that, however, does not only occur with research, but also in practice.

The questions raised aimed to seek the diverse opinions of the interviewed academics, many made comments on the subject and a few commented.

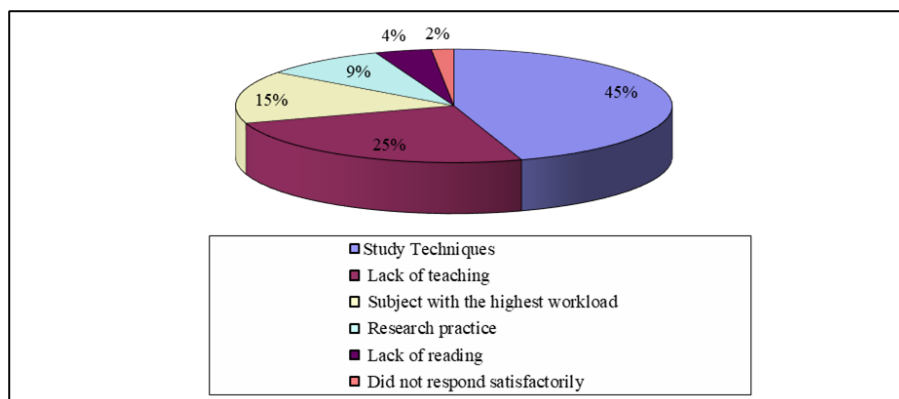
Below, after the tables and graphs, are recorded the comments, which will serve to refer to the discussion on the subject, precisely the main objectives of this research.

This research can be highlighted as positive, first because it seeks to know the difficulties, problems, suggestions for alternatives for change, often provoking discussions or divergences. Secondly, the barrier in which only the teacher speaks and teaches has been broken. The student, when talking about his problems, becomes a subject. He also has knowledge and therefore can also speak. It is not only the teacher who holds the knowledge, but also not up to him to give solutions to the problems listed by the students, it is up to him to create mechanisms and lead to the debate.

**Difficulties encountered**

**Table 01:** Difficulties encountered in the Methodology Discipline.

Motive	Number of students	%
Study Techniques	54	45%
Lack of didactics	30	25%
Discipline with a higher workload	18	15%
Research practice	11	9%
Lack of reading	5	4%
He did not respond satisfactorily	2	2%
<b>TOTAL</b>	<b>171</b>	<b>100%</b>



**Graph 1:** Difficulties encountered in the Methodology Discipline.

The above data were obtained from the tabulation of information provided by the students in an interview. They were helpful in answering the question and thus became fundamental pieces for the assembly of tables and graphs.

Most students, 45%, attribute the difficulties encountered due to the study techniques adopted. In view of the above, it is noted that the students did not have any experience focused on the use of research or even the scientific method before entering college.

The language that the educator uses often completes the student's understanding, since the discipline is based on technical terms. The lack of prior knowledge also makes it difficult to assimilate the subject, because by paying attention to its explanations...

The difficulties encountered consist in the fact that they do not have prior (in-depth) knowledge of the subject, which would allow a greater understanding. In general, the greatest difficulty consists in the norms, as there are many, confusing and the attitude of the educator, who sometimes confuses more than clarifies.

"Basically, it's memorizing techniques. They are boring, but indispensable."

Among academics, 25% attribute it to the lack of didactics. The way the teacher develops the subject, the lack of objectivity in discussing the subject and enriching the classes with dynamics in an easy-to-understand approach, with explanations pertinent to the theme, implementing actions in which this new knowledge is experienced.

The biggest difficulty encountered is the lack of a better preparation, that is, the base. I believe that when I studied or had this subject, the teacher lacked mastery and enthusiasm to transmit and me, the desire to learn.

Research methodology brings several peculiarities, the teacher and the student need to interact, making the importance of the methodology be assimilated. The definition of a theme I consider the most complicated stage in the preparation of the monograph.

It needs the professional to be trained to expose the subject, the research methodology, to the student, with updated techniques that facilitate the learning process.

It is observed that 15% of the students attribute these difficulties due to the workload, as it is a purely technical discipline requires more time for study and application of these techniques.

Scientific Methodology is nothing more than basic research of discoveries of reality, of the sciences, it is a constant search that never ends. It is a set of actions, which we propose to find solutions to problems, which is based on rational procedures.

The greatest difficulties I encounter, it is a clear orientation for paths to follow, the short time taught in undergraduate courses does not bring a basis for continuing research to reach satisfactory results. It is a complex subject, where there is a great need for reading and which we are not required and taught the habit of reading since childhood.

There is not enough time to delve into the subject. The language is purely technical and cultured, in which unknown terms appear, and due to the short time, it is difficult to understand. It is a discipline that needs a lot of workloads.

Of the academics interviewed, 9% think that the practice of research is complex, because making the correct use of these techniques generates insecurity and uncertainty of a job.

Research is something that is not present in our lives from an early age. And for this reason, the difficulties in carrying out the research arise. We are used to having everything at hand, and it is not necessary to go after subjects since the teachers themselves already chew them. There is a lack of interest on the part of the students and this lack of interest is what leads to difficulty in research.

I believe that this subject becomes complicated because there is not a very frequent practice of research. Research usually takes place to meet bureaucratic requirements and thus does not work as an expansion and search for knowledge. The discipline is very technical.

Several factors could be related; however, I highlight one as the main one: assuming attitudes and posture towards this subject, starting with the breaking of fear and assuming oneself as a researcher.

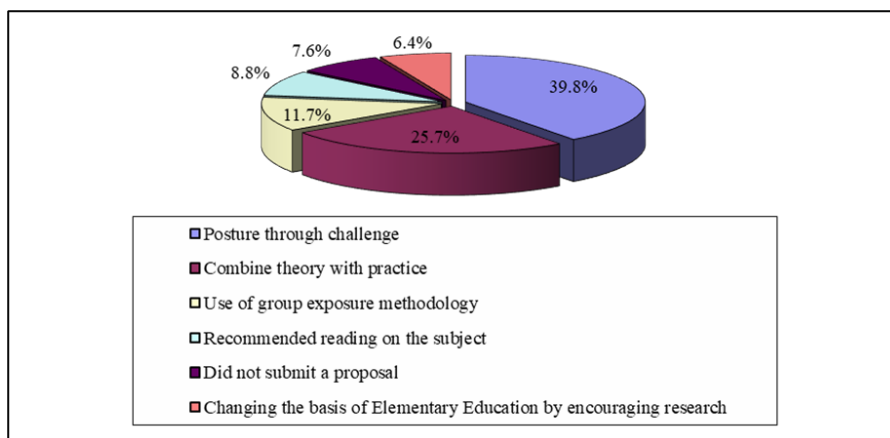
A small part of the students, 4%, attribute it to the lack of reading regarding the subject. Without reading, it is not possible to have a good theoretical foundation. "The difficulties arise not from the work itself, but from how to get to it. What is fundamental is reading, that is, how to read, what to read and how to absorb what one reads". "The lack of the habit of reading, the absence of philosophical exercise, the certainty that we are still *"homo sapiens"* and the fear of becoming *"hummus pensare"*. I am not in the habit of reading. This makes it difficult for them to understand scientific knowledge."

Only 2% of the students chose not to answer satisfactorily, because they were unable to clarify the difficulties pertinent to the discipline, they only know that it exists.

**Suggested alternatives**

**Table 02:** Suggested alternatives to face the challenges.

Alternatives	Number of students	%
Posture through the challenge	68	39,8%
Combining theory with practice	44	25,7%
Use of group exposure methodology	20	11,7%
Reading indication on the subject	15	8,8%
It did not submit a proposal	13	7,6%
Change the basis of Elementary Education by encouraging research	11	6,4%
<b>TOTAL</b>	<b>171</b>	<b>100%</b>



**Graph 2:** Suggested alternatives to face the challenges.

Many students, that is, 39.8% of the interviewees, understand that the posture through the challenge is a plausible alternative. Pointing out suggestions on how to make classes more attractive is complicated by the methodology and technicality of the discipline, as it is the production of scientific knowledge.

Although it is a very vast subject, it should be passed on to students in a light, objective, inspiring way, so that it leads them to understand the real meaning of study and its uses. Motivating them to go further, to continue doing research as an everyday practice.

The students, having support, will overcome the difficulties that existed before. They start to believe in their potential and become creative and motivated. Do not impose authority on the subject but use procedures that must be learned by the person once they are led to the study.

Show that research has applicability in our daily lives, having effective methods to avoid wasting time, that is, using clarity, commitment, a lot of research, dedication, involvement and feedback. May it be an interesting subject, and we can learn safely.

Combining theory and practice appears with 25.7%. We can say that there is only learning from the moment that one passes from theory to practice. Encouraging discoveries, showing paths. The importance is in reading, analyzing, selecting, thinking and then starting to apply the theory.

The methodology should be taught from literacy, where students already learn to read, research and put into practice what they have learned and manage to find meaning and start to use research correctly. You can

only learn by practicing and with more dynamic classes. Doing school-based work, perhaps we would have more important results.

The simplest way to understand this Subject is simply by doing your own monograph, because the theory has been passed on efficiently, now you just need to make it practical and use it. The subject has many theories, so nothing more interesting to put into practice. Practical teaching is long-lasting and each time it is practiced it is better assimilated and refined by the student.

This monographic work is a challenge that I was previously unaware of in how to develop it. I believe that the best way is always to unite theory with practice, teaching the "path of stones" in an objective, clear and simplified way and thus providing motivation, with stimulated production of ideas and a desire to literally be an active researcher in the search for knowledge.

Regarding the use of group exposure methodology, 11.7% propose that there should be group work in the training stages, so that ideas and norms would be worked in parallel with practice.

I think it will be of great help to present projects as examples, for analysis, dynamizing the classes, often with group work, to break this barrier of the word "scientific". That way it will already facilitate understanding. But it will only be effective if a division of work is made, so that each of the members plays his role in the group.

That they are trained teachers, who have mastery, experience, know how to transmit in a simple and objective way, are dynamic in their classroom practices, and allow group work to be carried out, for greater interaction with the subject.

Encourage the student, emphasizing the importance of discipline, propose various works to them, whether individual or even in group, because in a group there is a greater possibility of practicing what has been learned. This will even contribute to the preparation of the monograph.

As for the indication of reading on the subject, 8.8% say that to understand the subject of research methodology it is necessary a great deal of patience and good will to do a lot of reading on the subject, with this they will participate with more willingness to search for the necessary information.

Reading during classes from the first module, to understand the true meaning of the discipline, so that, in practice, you can really experience norms and rules to apply during the process, without so many doubts and insecurity.

To solve the problem, you need to be sure that this is what you want to accomplish, studying many authors who talk about the subject, observing, writing, raising hypotheses, analyzing, data, all this after a lot of reading about the subject. From there we will be able to develop the content in a clearer way.

Encourage the student, emphasizing the importance of discipline. Propose several works to them for better understanding, through readings referring to the content, to then understand how to prepare a work within the methodology. There is a need to know "what" is going to be worked on, to understand the techniques for a satisfactory result.

A small portion of students, 7.6%, did not present a proposal, because they do not fully know the subject discussed and have no idea of the paths to be followed.

"At the moment I don't have solutions, but I believe you were very happy to minister it, dynamic and creative."

"I liked the methodology applied, it was efficient and adequate, but I have no suggestions, given the content to be taught. I think that's the way it is."

"It seems that there is no connection." Only when we start writing, following the rules, will I really understand. "I have no suggestions."

Only 6.4% of the interviewees say that the basis of Elementary and High School should be changed, encouraging research, using everyday practices and forming a whole line of reasoning since childhood, so they will better assimilate the contents worked on in this discipline in the undergraduate course.

A solution to facilitate it would be to teach students already in Elementary and High School, in an understandable way, notions of research methodology, through reading, analysis, that is, practicing and learning, so they would understand better when they were in front of the discipline in the undergraduate course.

To get children used to reading, to encourage discoveries, to show the rewarding paths of research, to show results. In adulthood, these procedures will make classes more dynamic and less boring. The time is minimal, but if basic schoolwork were done as a curricular subject, perhaps we would have more important results.

If high schools turned their eyes to research, they would realize the importance of working on their techniques to develop students so that they can understand and work with the methodology without fear or difficulties.

### **Final opinion of the research**

Of the 171 students interviewed, the vast majority presented the difficulties encountered in understanding the Research Methodology and suggested some kind of alternative to the problem presented, a small part did not present or suggest anything.

Among the alternatives presented in the question of difficulties, the one that appears most frequently is the question of the research technique adopted. As for the suggestions of alternatives to overcome these difficulties, the one that was most emphasized was the issue of posture in the face of the challenge presented involving professor and academic.

At the time of the research, the importance of the project developed was emphasized, because it is a work that is as serious as possible, it is an existing problem, real and without many paths that lead to its solution. Many incentives were made about the work. It is perceived that there is in these academics the desire to learn, to know what is still unknown and frightening and that may be so lacking.

Betting on the ability to learn and develop practice is important and essential. The development of this work and its success is the main concern. There are strong reasons for this study to radiate, so the gains can expand the limits and point to measures to be incorporated into the care of undergraduate students.

After completing the study, an evaluation meets the needs, because through it a real proof of your learning is obtained.

With this, it is possible to make a diagnostic synthesis of the teaching of the methodology. In possession of the diagnoses, the educator has knowledge about the academics, their difficulties and their possible successes, overcoming them.

In short, every reflection on education and its problems, to be complete, must contemplate a look at the transformations of the present and the future. The faster these transformations are happening, the greater their importance in the educational environment, because the pedagogical action so necessary and processual in this movement will really prove to be very successful, when it is seen by human society as an attitude of conscience and desire for change.

"It is necessary, therefore, to make this awareness the first objective of all education: first of all, to provoke a critical attitude, of reflection, which compromises action." Kaercher, (1998, p.29). Thinking about education is a necessity if we want to avoid greater betrayals of youth, inevitably, a condemnation of all humanity.

#### **IV. Conclusion**

There are many learning difficulties for students in the discipline of Scientific Methodology, either due to the mistaken idea they have of research, considering the model adopted in basic schooling, the pure reproduction of sources, or even due to insufficient reading practice and interpretative construction capacity.

However, a contribution evaluated as fundamental in this issue is the collective work between teachers and students to make the necessary regulations, contributing to the advancement of the knowledge under study.

One of the great merits of this discipline is the reflection on the inconstancy of knowledge, as it allows the understanding of the need for human beings to produce questions and answers related to the doubts and questions posed, aiming at the interpretation and explanation of reality, things and phenomena. In this sense, the knowledge validated today, tomorrow can refute it, constitutes a fantastic aspect that translates into its own lack of conclusion of being, in the idea of the provisional. This brings us to the field of the production of explanations and truths.

It is common for students to have a concept of absolute truth, a single reference. In the process of readings and debates, the deconstruction of these ideas is something that becomes inevitable.

Learning and teaching Scientific Methodology cannot be limited to an activity distanced from pedagogical praxis, otherwise our role in the classroom will only be to demand compliance with rules, as well as to ask students to exercise written reflection without at least a more practical view in teaching didactics. Questions like this dialogue and question the doing and certainly help to teach better.

Retrospectively examining the itinerary of this work, one is clearly aware that some notes regarding the difficulties and possible alternatives were very interesting, while others, not so interesting, others were not even perceived.

It is known that it is a very complex subject and with that sometimes some aspects are not deepened, but this subject is not exhausted and is not limited in this work, other researchers may approach it, from other angles, other aspects, in this or in another amplitude, however, the results obtained here become satisfactory, because they are the result of the research, demonstrating the serenity of the people who proposed to carry it out and dedicated themselves to its elaboration.

It is worth mentioning that no researcher, no matter how capable he or she may be, should imagine a concrete result in first research, transforming it into a definitive discourse. The construction of knowledge takes place through a process that is the result of many exams, a lot of study and revisions, as many as necessary.

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