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WHAT CAN WE LEARN ABOUT THE SCIENTIFIC RESEARCH PROCESS FROM JULES VERNE? LESSONS FROM "JOURNEY TO THE CENTER OF THE EARTH"

O QUE PODEMOS APRENDER SOBRE O PROCESSO DE INVESTIGAÇÃO CIENTÍFICA COM JÚLIO VERNE? LIÇÕES A PARTIR DE "VIAGEM AO CENTRO DA TERRA"

Olívia de Quintana Figueiredo Pasqualeto[1]

Abstract: This paper aims to point out lessons about the scientific research process that can be extracted from the classic literary work Journey to the Center of the Earth, by Jules Verne. It starts with the argument that research is similar to a journey. To carry them out, prior preparation, the definition of a destination (objective) and the means on how to reach it (methodology) are required. The paper analyses four lessons which can be taken from Verne's work and can serve as compass for scientific research: (i) the research question must be well defined and doing so is not easy; (ii) the research methodology must be adequate and feasible; (iii) organization is essential; (iv) research is not always a bed of roses.

Keywords: **S**cientific research process; Methodology; Literature and teaching; Jules Verne; Journey to the Center of the Earth.

Resumo: Este artigo objetiva identificar lições sobre o processo de investigação científica que podem ser extraídas da obra literária clássica "Viagem ao centro da Terra", de Júlio Verne. O texto argumenta que uma pesquisa é semelhante a uma viagem. Para realiza-las, é necessária uma preparação prévia, a definição do destino (objetivo) e a organização de como se chegará até ele (metodologia). O artigo analisa quatro lições da obra de Verne que podem servir de guia para a pesquisa científica: (i) a questão de pesquisa deve estar bem definida e isso não é fácil; (ii) a metodologia de pesquisa deve ser adequada e viável; (iii) a organização é essencial; (iv) a pesquisa nem sempre é um mar de rosas.

Palavras-chave: Processo de investigação científica; Metodologia; Literatura e ensino; Júlio Verne; Viagem ao centro da Terra.

1 Introduction

The idea of writing this paper rose while I was writing my PhD thesis. Developing the research methodology and, at the same time, as entertainment, reading the book Journey to the Center of the Earth (released in 1894), by Jules Verne, I realized, at that moment (an intense moment, in the middle of the doctorate), that the two activities (scientific research and travelling), apparently so distinct and disconnected, actually had a lot in common.

[1] PhD and Masters of Law from University of São Paulo (USP). Professor of Labour Law at Fundação Getúlio Vargas São Paulo Law School (FGV Direito SP), São Paulo/SP, Brazil. E-mail: olivia.pasqualeto@fgv.br

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The intention of writing this text, since then, began to mature and, finally, it was realized. Thus, this paper materializes these reflections on the scientific research process based on Verne's fictional work, seeking to draw parallels between the phases of scientific research process with the characters' journey to the center of the Earth.

Furthermore, this text also materializes some of the conversations I have always had with my students, highlighting lessons that are useful for those who are embarking on the academic field – and on the adventure of scientific research – and showing that scientific research follows a method and is not the result of mere "guesswork".

We seek to identify possible lessons that can be extracted from Verne's work for the scientific research process. As it will be clearly stated below, although they are not new, the lessons are central to the development of any scientific research, in its different levels of complexity and purposes. Not only are these the concerns that guide scientific research, but lessons drawn from the book under analysis, it is essential to emphasize.

Although Verne has written other remarkable books that also report exciting journeys, such as "Around the World in 80 Days", Journey to the Center of the Earth was not chosen in this text nonchalantly. The main traveler is Professor Liedenbrock, who, in addition to the description of the trip, also allows us to learn about some experiences in the academic area.

In order to do so, this article is organized into two main parts: the first, composed of a single item, points out the connection between traveling and research, briefly presenting the plot of Journey to the Center of the Earth to readers; and the second, composed of four items, highlights the lessons learned from "Journey to the Center of the Earth". Finally, some final remarks are drawn.

2 Searching is like traveling (to the center of the Earth)

Searching is like travelling. Doing a research is like taking a trip: we set off from a comfortable place, where the surroundings are known, to an unknown and unfamiliar place that can provide different kind of discoveries and contact new people.

For a trip to be successful, some kind of planning is necessary: Where to go? How to go? Where to stay? How much money to take? What to do? How long will it take? Who has been to this destination and can help me with advice and suggestions? (In addition to many other questions that are necessary for a good trip.)

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The same happens with research: in order to reach the objective, it is necessary to design and architect the best way to achieve it. This planning of strategies, methods and techniques is appropriately entitled methodology. Thus, having clarity about the research guiding question and clarifying the methodology that will be used is essential for a research to fulfill its objective and for a trip to be appreciated by the travellr.

In this paper, we hitchhiked with mineralogy professor Otto Liedenbrock's journey to the center of the Earth to reflect on research scientific process and some important precautions that we must take from the elaboration of a research project to the development of the research itself.

Verne begins the narrative by introducing the eccentric Professor Liedenbrock: "he was professor at the Johannaeum, and was delivering a series of lectures on mineralogy, in the course of every one of which he broke into a passion once or twice at leas" (VERNE, 2007, p. 12). According to his nephew, "his teaching was as the German philosophy calls it, subjective; it was to benefit himself, not others. He was a learned egotist" (VERNE, 2007, p. 13).

In his "little house, No. 19 Konigstrasse, one of the oldest streets in the portion of the oldest city of Hamburg" (VERNE, 2007, p. 11), there was a study room filled with the professor's books, stones and other materials. In this room, while was showing a book to his nephew (Axel, the narrator), Liedenbrock discovers an old parchment with symbols and characters, evidencing a message written by the alchemist Arne Saknussemm to be deciphered.

After working hours and hours, trying to understand the symbols, researching through different sources what the message in the manuscript could be and having a deep exchange of ideas, the duo deciphered the message's contents: "Descend, bold traveller, into the crater of the jokul of Sneffels, which the shadow of Scartaris touches before the kalends of July, and you will attain the centre of the Earth; which I have done, Arne Saknussemm" (VERNE, 2007, p. 52).

From then on, Liedenbrock becomes obsessed with the possibility of reaching the center of the Earth. Axel pointed out to the professor several objections to the trip: high temperatures in the center of the Earth, darkness, lack of water and food, among others. Professor Liedenbrock, however, refuted all of them and reinforced that, if no one had reached the center of the Earth, it was not possible to make such claims.

> […] You see, Axel, he added, the condition of the terrestrial nucleus has given rise to various hypotheses among geologists; there is no proof at all for this internal heat; my opinion is that there is no such thing, it cannot be; besides we

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> shall see for ourselves, and, like Arne Saknussemm, we shall know exactly what to hold as truth concerning this grand question.Very well, we shall see, I replied, feeling myself carried off by his contagious enthusiasm. Yes, we shall see; that is, if it is possible to see anything there. And why not? May we not depend upon electric phenomena to give us light? May we not even expect light from the atmosphere, the pressure of which may render it luminous as we approach the centre? Yes, yes, said I; that is possible, too. It is certain," exclaimed my uncle in a tone of triumph. But silence, do you hear me? silence upon the whole subject; and let no one get before us in this design of discovering the centre of the earth (VERNE, 2007, p. 65).

From there, he begins the thorough preparations to reproduce Saknussemm's feat and reach the center of the Earth. After a few days, the professor and his nephew leave for the expedition and count on a local guide to reach their destination. Along the way, they face several mishaps, unusual situations and an unexpected outcome.

The journey narrative presents opportunities and challenges that are particularly similar to those found throughout the scientific research: detailed planning, organization oof the material that will be used, various difficulties (from identifying the objective to coming across something unplanned), the need to readapt plans, dialogue with peers.

From these points of contact, possible lessons that could be learned from the "Journey to the center of the Earth" are pointed out below. The lessons were selected considering the stages of the journey described in the book, starting with the preparation of the trip (a stage that involves planning, expectations and uncertainties about the destination and how to get there), going through the journey itself (a stage in which planning is put into practice, which involves a lot of energy from the researcher-traveller and possible obstacles) until reaching the end of the journey (stage in which the destination is reached - or not - and when the research results are achieved). Each of these stages allowed lessons to be drawn that are also useful for the research journey.

3 Lesson #1: The research question must be well-defined and doing so is not easy

Before discovering that his destiny was the center of the Earth, Professor Liedenbrock had spent hours trying to understand what was the meaning of the symbols in Arne Saknussemm's message, that is, the professor took time to discover what his objective was.

According to Professor Liedenbrock, in his own words,

> […] I was struggling with an insurmountable difficulty; my brain got heated, my eyes watered over that sheet of paper; its hundred and thirty-two letters seemed to flutter and fly around me like those motes of mingled light and darkness which float in the air around the head when the blood is rushing upwards with undue violence. I was a prey to a kind of hallucination; I was

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> stifling; I wanted air. Unconsciously I fanned myself with the bit of paper, the back and front of which successively came before my eyes (VERNE, 2007, p. 44).

This difficulty further occurs in the process of defining a research question, that is, the question that will guide the research and the researcher, which will serve as a compass for the development of the investigation. This is a crucial moment because it is this question that will determine all the next steps: methodology, schedule, text writing, etc. It is the research question that expresses what the researcher effectively wants to understand; what the problem to be solved is; and, finally, what is the contribution that the investigation will offer to the field of knowledge.

This arduous process of decoding the manuscript by the professor and his nephew shows that the process of elaborating the research question also comes from a lot of study and reading of the literature on the research object. According to Leal, diving into the literature relevant to his research topic provides researchers with real contact with the work of other researchers, which is "indispensable to stimulate their imagination regarding the ways and procedures of their own research" (LEAL, 2002, p. 236). Knowledge of the state of the art and dialogue with authors and bibliographical references about the research object allow us to get to know the field and identify a relevant object, leading us to the delimitation of the research question.

Defining the research question is not at all a simple task, as it needs to be outlined , that is, to describe and objectively circumscribe the problem on which the research will focus; nor is it clear, which means that there is no room for dubiousness or uncertainty here, due to the fact that the more the question gives rise to different interpretations, the more difficult it will be for the researcher to achieve his/her objective.

According to Gil (2002), unstructured and vague problems are frequent, for which it is not even possible to imagine how to begin to solve them, which is something that jeopardizes the conduct of the research and the achievement of objectives. Thus, it is important that the question is realistic to be answered (RICHARDSON, 2012).

Thereby, when more carefully formulated, the research question tends to be more precise and a better guide to the process. "The research question helps you keep focus throughout a study" (STAKE, 2010, p. 77). As it works like a compass, if it is out of calibration – as is the case with Professor Liedenbrock's compass – it can take the researcher to inhospitable or unwanted places.

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Finding a clear and delimited question requires preparation. It is essential to know the research topic and study it in order to find a question that is relevant, which can contribute something new and that makes sense. Gil (2002) emphasizes that the systematic immersion in the object, the study of the literature and discussion with people who accumulate a lot of experience in the field of study help the researcher in the process of elaborating the question.

According to Epstein e Martin (2014), a good research question should have a potential implication (normative, policy, or otherwise) for the real world, bringing concrete contributions to reality; and should seek to engage with the existing literature, which gives the research more credibility.

This engagement with the literature also demonstrates mastery over the research question, shedding light to the fact that the researcher is inserted in the field and is able to carry out the investigation. The passages in which the Professor and his nephew begin to discover what a Sneffels means, before actually starting the journey, illustrate the importance of knowing the research question well: “Well, in the first place, I wish to ask what are this Jokul, this Sneffels, and this Scartaris, names which I have never heard before?” (VERNE, 2007, p. 58).

The definition of the research question is a very initial moment of the research and that, unfortunately, is sometimes neglected. It is a laborious process, which requires comings and goings, formulations and reformulations of the research question. As previously stated, it requires study and dedication to elaborate a delimited and clear guiding question.

This process of defining the research question is also similar to the professor's descent to the center of the earth: we start at the surface (of a topic, still broad), we go deeper (in the details, possible approaches, points not yet studied) to reach into a clear and well-defined research problem.

Sometimes, as with Liedenbrock, we spend days, nights, weeks and months before we define the question. We get anxious and feel like we have been wasting precious writing time.

However, although it is not a quick and simple task, it is essential that this moment of elaboration of the research question is respected and well used, so that the investigation is guided by a clear question and does not leave the researcher lost (without knowing what to study, what to read, how to research, among other difficulties).

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4 Lesson #2: the research methodology must be adequate and feasible

With the research question defined, it is time to reflect on how to answer it, that is, how to reach the destination of this trip. The path taken that indicates how the research was done can be called research methodology.

The organization of the methodology varies according to the peculiarities of each research. Therefore, one cannot say that one methodology is better than the other. There is an adequate methodology for a given research, which allows the researcher to answer the research question. As Kothari (2004) points out, "it is necessary for the researcher to design his methodology for his problem as the same may differ from problem to problem" (p. 8).

As an example, should the research propose to map the jurisprudence, the methodology will describe how and with what criteria the jurisprudence of a particular court was collected and analyzed; if a research seeks to understand what a newspaper reports on certain politicians, the methodology will present how the collection and analysis of news was carried out; if a research is dedicated to literature review, the methodology will focus on the databases used and search terms used throughout this review. In this sense, it is important that the researcher is attached to the research question to reflect on the research methodology. In summary, as Flick suggests (2012), it is necessary to choose the appropriate methodology for each study.

As Leal (2002) warns, the research methodology is often taken for a recipe, a mere manual of procedures, as if it was enough to follow the recipe to have a research in progress: "nothing is falser than that" (LEAL, 2009, p. 22). So, depending on the specifics of each research, it is possible that there are different and specific concerns with the methodology, such as: describing protocols in detail; gathering equipment; interviewing people; collecting and analyzing documents (which are sometimes not easily accessible); taking trips; being present in a certain place to make observations; understanding different languages, among others.

In Journey to the Center of the Earth, in different passages, Professor Liedenbrock presents his concern with the preparations for the trip and with the instruments that will make it possible. According to the nephew,

> […] forty-eight hours were left before our departure; to my great regret I had to employ them in preparations; for all our ingenuity was required to pack every article to the best advantage; instruments here, arms there, tools in this package, provisions in that: four sets of packages in all. The instruments were:

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> 1. An Eigel's centigrade thermometer, graduated up to 150 degrees (302 degrees Fahr.), which seemed to me too much or too little. Too much if the internal heat was to rise so high, for in this case we should be baked, not enough to measure the temperature of springs or any matter in a state of fusion.
> 2. An aneroid barometer, to indicate extreme pressures of the atmosphere. An ordinary barometer would not have answered the purpose, as the pressure would increase during our descent to a point which the mercurial barometer would not register.
> 3. A chronometer, made by Boissonnas, jun., of Geneva, accurately set to the meridian of Hamburg.
> 4. Two compasses, viz., a common compass and a dipping needle.
> 5. A night glass.
> 6. Two of Ruhmkorff's apparatus, which, by means of an electric current, supplied a safe and handy por table light (VERNE, 2007, p. 111).

For travellers to reach their destination in the book, this equipment was understood to be necessary for the correct path to be followed. Were the trip destined to a different place, they would probably choose other materials, add some and remove others. This same (methodological) preparation is paramount for scientific research.

Finally, it is important to mention that in addition to being adequate (to the research question), the proposed methodology must also be viable and feasible in terms of resources and time.

Hence, when designing the methodology, it is important to keep in mind if there are financial resources for it (to cover the costs of materials, travel, software, for example), if there is enough time (to interview a large number of people, for example), if there are enough people available because, depending on the magnitude of the research, hardly a single person would be able to complete it.

The researcher, therefore, must consider the ability of the proposed methodology to answer the research question, as well as whether it is feasible for an investigation, considering available time and resources.

5 Lesson #3: Organization is essential

Organization is vital in different areas, including research. Organization – of tasks, deadlines, deliverables, writing, etc. – is essential for the researcher to be able to develop and complete the research more smoothly, without having to skip important steps or do them without due care. There are different scopes of organization. In this paper, we cite the six main ones: personal, collective, temporal, financial, resource and formal.

The first – personal organization – is linked to the organization of the researcher himself/herself, who must keep in mind: when he/she will carry out the research activities,

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which tasks will be done first, how to make the research activities compatible with his/her other tasks and his/her personal life.

After all, as can be seen from Verne's work, it is important to sleep and to be in a good mood to continue the journey: "[…] each of us, exhausted with three sleepless nights, fell into a broken and painful sleep. The next day was splendid" (VERNE, 2007, p. 321). This rest time also applies to the work of the researcher.

The second – collective organization – is connected with activities that involve other people, which is frequent in collective research with more than one researcher. In these cases, it is important to clearly divide the tasks and assignments for each researcher, as Professor Liedenbrock did, determining who would take each material along the trip. Furthermore, the different researchers must communicate plainly so that the research does not become disconnected and maintain harmony between the different fronts.

The third – temporal organization – corresponds to meeting deadlines and balancing activities throughout the investigation. The schedule is an instrument that can assist the researcher in the task of determining when the different steps of the research will be taken.

> Then we had cleared two hundred and seventy leagues of sea, and we were six hundred leagues from Iceland. Very well, answered my uncle; let us start from that point and count four days' storm, during which our rate cannot have been less than eighty leagues in the twenty-four hours. That is right; and this would make three hundred leagues more (VERNE, 2007, p. 326).

It is important to remember that the schedule is not something immutable, that is, it can be changed over time, however, it is an important guide to conduct the researcher and remember the different phases to be fulfilled in the investigation.

According to Acca (2019), one of the fundamental points for the activities to be performed satisfactorily concerns the time that the researcher actually has. And time is a "scarce resource" (ACCA, 2019, p. 192). The structuring of an action plan should not be seen as a mere bureaucratic task, as it is paramount for the final result of a research. Organizing is not "wasting time for nothing" (ACCA, 2019, p. 192).

This scope of organization is vastly explored in Journey to the Center of the Earth, because before the trip, the Professor predicts well in advance the day of departure and arrival at each of the stopping points, although, along the journey, some dates and times are modified since they have to wait for the person who would guide them to their destination.

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The fourth – financial organization – is important for the researcher to be able to bring economic sustainability and transparency (especially when the research is funded) to the investigation. It is necessary that the costs of materials and services necessary for the research have been foreseen. Thus, as an example, if the research proposes to carry out interviews, it is necessary to consider whether there will be costs for doing so, such as the cost of tickets and accommodation in another location.

Along the journey to the center of the Earth, Professor Liedenbrock had various costs, such as guides and transport with Captain Bjarne, for example. "You must be on board on Tuesday, at seven in the morning, said the Captain, after having pocketed some dollars" from Liedenbrock.

The fifth – organization of resources – concerns the use of various resources (paid or free), such as books, meeting rooms, software, among others. Therefore, it is necessary for the researcher to organize himself/herself to be prepared to use a book borrowed from the library, for example, during the period in which it is available.

The sixth – formal organization – involves possible formalities that must be fulfilled throughout the research, such as approval by an ethics committee, authorization for the use of certain data, etc. The researcher must predict whether his investigation will go through any of these formal procedures because, should they be neglected, it is possible that the research will be made unfeasible.

Finally, it is relevant to keep in mind that these different areas of organization intertwine and influence each other, and it is important that they are thought of in a systemic way.

6 Lesson #4: Research is not always a bed of roses

The narrative of the journey to the center of the Earth reminds us that travelling – as well as researching – is not always a bed of roses, that is: we will not always be able to execute everything that was planned out and, sometimes, the results obtained are unexpected and, in some cases, even frustrating.

Along the journey, nephew Axel reports many difficulties: "Suddenly there was no ground under me. I felt myself revolving in air, striking and rebounding against the craggy projections of a vertical gallery, quite a well; my head struck against a sharp corner of the rock, and I became unconscious" (VERNE, 2007, p. 252).

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We also face several difficulties in the development of the research. There are many examples: lack of access to certain texts, not understanding a foreign language, difficulty in contacting interviewees, inexperience with software, inability to access some places, among others. These difficulties are natural Nevertheless, it is important that the researcher is minimally prepared to cope with these mishaps, so that the research does not become completely unfeasible.

Therefore, it is necessary to be well prepared to carry out an investigation and to be aware of possible limitations of the researcher when proposing a research project. This awareness is directly related to the organization of the researcher (in all its scopes, as mentioned in Lesson #3) given that – to avoid unpleasant surprises, such as the lack of access to materials or the impossibility of contacting interviewees – it involves precautions such as not leaving tasks to be carried out in the last days of the deadline, thinking about alternative plans in case the master plan meets with failure, among other good practices.

In addition to these difficulties (easier or harder to solve), it is also necessary to be prepared for possible unexpected research results. As discussed in Lesson #1, scientific research is dedicated to answering or trying to answer a research question with a view to contributing to the field of knowledge.

In this process, depending on the methodology adopted, the researcher could formulate an assorted number of hypotheses – that is, a "proposition or a set of propositions set forth as an explanation for the occurrence of some specified group of phenomena either asserted merely as a provisional conjecture to guide some investigation or accepted as highly probable in the light of established facts" (KOTHARI, 2004, p. 184) – and, in the course of the investigation, testthese hypotheses.

Often, there is an intention (albeit unconscious) on the part of the researcher to prove his hypothesis. However, it is necessary to understand that this will not always happen. In many cases, the research carried out will show that the hypothesis raised by the researcher was incorrect or was partially false and this result, although frustrating for some researchers, is fully valid since it has created therefore the denial of the hypothesis being an equally important result of the research.

According to Gross (2019), the researcher, then, has no reason to fear criticism that can be made to his/her initial hypothesis. On the contrary: he or she can and must be open to the persuasive power of these criticisms because his/her duty is not to defend the hypothesis.

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The denial of the hypotheses is commonly observed in empirical research because, when having contact with their surroundings, with the field, with different actors, the researcher often identifies flaws or inaccuracies in the theories, showing that the things "in the books" (HALPERIN, 2011, p. 64) do not always correspond to the reality.

This frustration can be seen in Journey to the Center of the Earth when travellers realize that they are not in the center of the Earth, but in Stromboli, in the middle of the Mediterranean, amidst olive trees and mountains.

> We were hardly thinking of that. Stromboli! What an effect this unexpected name produced upon my mind! We were in the midst of the Mediterranean Sea, on an island of the Aeolian archipelago, in the ancient Strongyle, where Aeolus kept the winds and the storms chained up, to be let loose at his will. And those distant blue mountains in the east were the mountains of Calabria.
> [...]
> Having entered by one volcano, we had issued out of another more than two thousand miles from Snefell and from that barren, far-away Iceland! (VERNE, 2007, p. 402-403).

It happened due to an error in the compass that guided them:

> One day, while arranging a collection of minerals in his cabinet, I noticed in a corner this unhappy compass, which we had long lost sight of; I opened it, and began to watch it.
> […]
> Professor: Well?
> Alex: See, its poles are reversed!
> Professor: Reversed?
> Alex: Yes, they point the wrong way.
> My uncle looked, he compared, and the house shook with his triumphant leap of exultation. A light broke in upon his spirit and mine. See there, he cried, as soon as he was able to speak. After our arrival at Cape Saknussemm the north pole of the needle of this confounded compass began to point south instead of north. Evidently! Here, then, is the explanation of our mistake.
> Professor: But what phenomenon could have caused this reversal of the poles?
> Alex: The reason is evident, uncle.
> Professor: Tell me, then, Axel.
> Alex: During the electric storm on the Liedenbrock sea, that ball of fire, which magnetised all the iron on board, reversed the poles of our magnet!"
> Professor: Aha! aha! Shouted the Professor with a loud laugh: So, it was just an electric joke!

In the case of Professor Liedenbrock and his nephew, this unexpected result came about because they did not realize that the compass needles were inverted, which alerts us to the need to always review our research protocols and our analyses. In order to do that, researcher organization is essential. However, it is possible that we get unexpected results not because of a researcher error, but because of a genuine investigation finding.

Therefore, developing a survey is not always a bed of roses. During this trip, it is possible that we have unforeseen events and need to reorganize our plans.

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7 Conclusion

Based on Jules Verne's book, Journey to the Center of the Earth, this text sought to extract some lessons about scientific research from the parallel between research and travel. Four core lessons were drawn: (i) the research question must be well defined and doing so is not easy; (ii) the research methodology must be adequate and feasible; (iii) organization is essential; (iv) research is not always a bed of roses.

These lessons are not new, however, they are important to be on the radar of every researcher, whether in early career research, such as those carried out at graduation, or in more complex research, such as PhD theses. Regardless of this knowledge it is common to observe students (even in more advanced research stages) with difficulties in carrying out basic steps of an investigation, such as the elaboration of a research question.

Furthermore, it is worth mentioning that these are not the only lessons that can be extracted from the work, although they are the ones that are more in-depth throughout the book and that is why they were detailed in this text.

In Journey to the Center of the Earth, we can also learn from Professor Liedenbrock the preference for references and original research sources (avoiding their translations or summaries, when it is possible), as well as reflections on fears and habits in the scientific environment, such as the fear of disclosing discoveries, having stolen ideas and mistrust among peers. Although it is a classic science fiction book, in Journey to the Center of the Earth, Jules Verne encourages us to reflect on doing research, its difficulties and opportunities, leaving room for different lessons on academic life itself.

Finally, the adventure narrated by Verne further reminds us that research is an adventure in itself: the Professor Liedenbrock's enthusiasm and the eagerness to unveil the unknown remind us of how important it is for the researcher to venture along the paths and opportunities that the research process scientific investigation offers us.

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