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INTERDISCIPLINARITY IN SCIENTIFIC RESEARCH: THE EMPLOYMENT OF TECHNOLOGICAL TOOLS IN DATA ANALYSIS WITHIN AN INTERDISCIPLINARY CONTEXT

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Abstract: This article aims to present the importance of using technologies in data analysis for scientific research in an interdisciplinary context. It is known that technology currently constitutes a tool in common between different areas of knowledge, which makes it an instrument of great relevance for both parties, as it facilitates the researcher to analyze large amounts of information in different areas in a technical, practical and technical way. minimizing the margin of error. These relationships between different areas of knowledge, especially within scientific research, are very important to have a better understanding of a subject under discussion, and to find explanations for such facts and questions. In view of this, to evidence such facts, bibliographical research was carried out as methodological procedures, in which already published works were used as a source, such as: articles, master's dissertation, doctoral thesis and books, to validate/relate in order to present the contributions of several authors on the proposed theme. Finally, the research findings could show that, with the advancement of technology, as discussed in the text, much software with the help of the internet and some electronic devices such as notebooks, tablets, smartphones, among other resources, have been favoring this type of work and providing the speed and precision in obtaining and analyzing data, improving the execution of tasks in an agile, precise and compensatory way.

1 Introduction

Interdisciplinarity is nowadays a widely discussed science topic. It deals with a diverse body of disciplines and areas of knowledge, which interact in a way to arrive at new perspectives on a common object of investigation, uniting knowledge and avoiding information fragmentation. The relationship between different areas of knowledge, especially within scientific research, is extremely important in order to better understand a subject under discussion, as well as to find explanations for facts and questions [1]. In addition, there are common tools between the areas, which are used to process this information. Among them, technological tools deserve special attention since they are highly useful in collecting information, and storing and manipulating data [2].

Currently, we live in a world full of technological tools that help us in our various daily activities. The use of these tools has been widely recommended because they facilitate the execution of tasks, thus helping to achieve goals in a simplified and less laborious way. In addition, they are used in many areas of knowledge, in its modalities and specific applications, whether through software tools or electronic devices, etc., helping them in their actions and achieving results [3].

Under this consideration, the main point of reflection presented in this article is the use of technological tools in the process of data analysis within an interdisciplinary context. In order to achieve this, we used bibliographic sources such as articles, master's, doctoral thesis and books, seeking to validate and relate technological tools with data analysis and interdisciplinarity.

2 State of the Art

2.1 Technological tools

We currently live in an era of technological development never seen before, in which mankind, through our needs and ability to reinvent ourselves in the face of challenging situations, have developed and improved technological knowledge that benefits us in the most different areas and fields of action, becoming an indispensable instrument in our lives. Such technological knowledge contributed to the creation of tools, which provided solutions and improvements in several sectors (such as: health, economy, education, etc.), since they help

in different activities, fulfilling purposes and at the same time serving as basis for the creation of new ideas, or improvements, from the perspective of other researchers [3].

Furthermore, the emergence of electronic devices and the arrival of the internet, besides revolutionizing the media, gave us the ability to carry out different works, including creating, analyzing and simulating tasks in a virtual way, which gave the users the ability to communicate among each other, as well as sharing and accessing information in real time. Some devices even have a compact design that fits in the palm of the hand (Figure 1), which can be easily transported inside a pocket [4].

Figure 1 The smartphone as a world of information in the palm of the hand.

Nowadays, with the help of technological/digital tools, it has become possible to verify whether certain ideas, theories, hypotheses, etc., can succeed or not when put into practice, as well as identify possible failures in case of failure. This type of action can be planned and tested through applications in scenarios involving computer simulations, in which in these spaces it is possible to simulate possible situations based on real trajectories/activity, in which from this it is possible to have a futuristic view of such facts or analyzed data, as well as extracting information that can serve as a basis for further research and generation of results [5]. The use of these tools are extremely important in the decision-making process, especially when the issues dealt with may in the future cause damage to people's health and lives, preventing them from possible eventualities that may happen by taking hasty actions [6].

2.2 Data analysis

According to Mozzato and Rzybovski [7], data analysis consists in one of the most important stages of a research project, since it allows the researcher to make decisions strategically, extract information of interest and reach conclusions on the subject of interest. This activity constitutes of a systematic in-depth study of data regarding an area of interest. It represents a high level of significant work, which in many cases can become exhausting activities, depending on the method, tool, or field of action chosen to be analyzed.

Data analysis, according to Bardin [8], can be defined as:

A collection of communication analysis tools that seek to obtain, through systematic methods and content description objectives indicators (quantitative or not) that allow the inference of knowledge regarding the conditions of production or reception of such messages [8].

Bortoloti and Bruns [9], emphasizes the importance of attention in the data analysis process, because when performing this type of action in a hasty or erroneous way, it can compromise all the carried-out research, producing false conclusions and putting to waste years of research in a chosen field of study. Minayo [10] states that:

We should describe with clarity how data is organized and analyzed. For instance, content analyses, of speech, or dialectic analysis are possible proceedings for analysis and interpretation of data and each one of these modalities advocates a different treatment for the organization and systematization of data [10].

Today, thanks to technology development, it is possible to analyze large amounts of data in different areas through technical, fast and practical ways, with the help of cutting-edge technological tools, predefined to work according to the situations of interest. Currently there are platforms capable of automating the capture of information and performing interpretations intelligently, applying Artificial Intelligence (AI), which consists of identifying patterns of behavior about the information being observed and from there extracting data from different perspectives and reach conclusions in a systematic way [11].

2.3 Interdisciplinary context

According to Cesco [12], interdisciplinarity consists on the relationship between different disciplines or areas of knowledge, in order to interact and seek a better understanding of a given problem. The objective of this interaction is to treat common research objects from different professional perspectives and their related areas, in order to seek answers to complex problems (Figure 2), which a single discipline or specific area of knowledge is not capable of solving. This relationship tends to provide an exchange of individual knowledge, which, when interconnected, lead the achievement of better results on the issue under discussion.

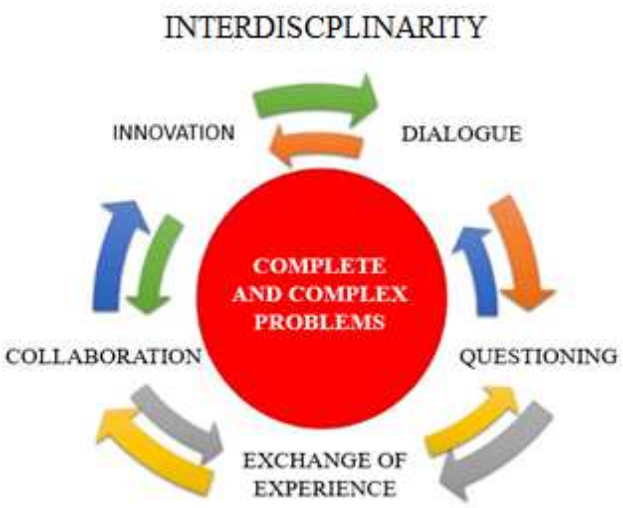

Figure 2 Schematic representation of interdisciplinary work and the contributions that the interaction between disciplines can offer in search for problem solution.

In order to work in an interdisciplinary way, it is necessary to have a common object of study between different disciplines, and based on it, one might raise a contextualized approach on the subject addressed. Bicudo [13] in his article entitled "Interdisciplinary research: a possibility for the construction of scientific/academic work", questions how to work in an interdisciplinary way. According to him:

It is always necessary to have a theme as a guideline for the investigation. A sufficiently comprehensive subject, which approaches do not fit within the limits of a discipline, pushing its limits and not adapting to its methods. However, the inherent rigor of scientific procedures must be observed, so that researchers do not inadvertently appropriate it, without a cautious study carried out with the support of researchers from interconnected disciplines, the research and respective results or discussions exposed outside these disciplines. It requires that you work in a group, respecting each other, that you treat knowledge as activity and not as merchandise, that you have the humility to listen to each other and express questions and naive doubts [13].

Still in this scenario, when it comes to the common object of study, there are different ways of analyzing this data that will serve as basis for future contextualization. Among them, we highlight the use of technological tools to achieve this specific purpose, through intelligent software, electronic forms, etc., which can help in the process of collecting data and interpreting information systematically [2].

3 Methodology

This article consisted of bibliographical research, in which we used already published works, in order to present the contributions of several authors on the proposed subject. In Gil's view [14], "bibliographic research is developed based on material already prepared, consisting mainly of books and scientific articles". Pereira and Pacheco [15] say that this kind of research is used in almost all sorts of study, however, there are certain cases in which studies are developed specifically based on bibliographic research.

Thus, the research carried out here was qualitative, which emphasizes the inductive interpretation as the main characteristic, despite the existence of other investigation methods. According to Minayo [10], "it answers very particular questions. It is concerned, in the social sciences, with a level of reality that cannot or should not be quantified".

4 Conclusion

The present study made it possible to reflect on the applicability of technological tools in an interdisciplinary context, emphasizing their importance in analyzing and obtaining data.

In this context, it was observed based on the bibliographic research of authors, that scientific research is not based only on a content, theme or topic, it involves several aspects, that is, we develop the studies taking into account various disciplines, tools and equipment, analysis multiplies, several lines of science to arrive at the result. And through such interactions, it is necessary to use tools that provide researchers with improvements in the execution of these tasks, in an agile, precise and compensatory way.

In view of this, the research findings could show that, with the advancement of technology, as discussed in the text, many software with internet aid and some electronic devices such as notebooks, tablets, smartphones, among other resources, have been favoring this type of work and providing the speed and accuracy in obtaining and analyzing data. Still from this perspective, it is expected that in the future, works where other researchers will be concerned about adopting such tools in their research scenarios, so that they can improve their results and their assertiveness.

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