COMPLEXITY AND OTHER PARADIGMS – INTRODUCTION TO COMPARATIVE ANALYSIS

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Abstract: The complexity paradigm was recently developed by Edgar Morin, it is one of the most used in the investigation and understanding of problems that concern the scientific field. Complexity must be considered as a challenge to think in an organizational way, making it possible to program and clarify the facts. The problem of complexity constitutes an effort to conceive an unavoidable challenge launched by the real, respecting the different dimensions of the phenomenon studied. This paradigm forces us to unite notions that are excluded within the scope of the principle of simplification, and contradictory notions are linked to it, which are disorganized or organized as the relationship between the observer and the object develops. The complexity paradigm has differences in relation to other precedent paradigms such as the positivist, in which the researcher places himself in a situation of exemption from reality; the phenomenological, which starts from the perspective that the world and the real are socially constructed, receiving a meaning from the subject himself; the structuralist, who seeks to explain reality at all its levels based on the notion of structure; historical-dialectical materialism, which holds that the world is dialectical and the essence of dialectical materialism cannot be understood apart from its unity with historical materialism. Thus, it will be verified what is the relationship that exists between these different paradigms and the paradigm of complexity. which starts from the perspective that the world and the real are socially constructed, receiving a meaning from the subject himself; the structuralist, who seeks to explain reality at all its levels based on the notion of structure; historical-dialectical materialism, which holds that the world is dialectical and the essence of dialectical materialism cannot be understood apart from its unity with historical materialism. Thus, it will be verified what is the relationship that exists between these different paradigms and the paradigm of complexity. which starts from the perspective that the world and the real are socially constructed, receiving a meaning from the subject himself; the structuralist, who seeks to explain reality at all its levels based on the notion of structure; historical-dialectical materialism, which holds that the world is dialectical and the essence of dialectical materialism cannot be understood apart from its unity with historical materialism. Thus, it will be verified what is the relationship that exists between these different paradigms and the paradigm of complexity. which holds that the world is dialectical and the essence of dialectical materialism cannot be understood apart from its unity with historical materialism. Thus, it will be verified what is the relationship that exists between these different paradigms and the paradigm of complexity. which holds that the world is dialectical and the essence of dialectical materialism cannot be understood apart from its unity with historical materialism. Thus, it will be verified what is the relationship that exists between these different paradigms and the paradigm of complexity.

Keywords: Paradigm; complexity; comparative method.

INTRODUCTION

The paradigm constitutes the foundation on which the scientific community develops its research, which serves as a basis for the subsequent developments of science. A paradigm is composed of rules that guide scientific investigation, once a certain paradigm is established, research advances in solving problems.

Pádua (1996) defines the paradigm as an exemplar, a standard model, on which

the idealized construction is carried out, which serves for the analysis or evaluation of a concrete reality. Thus, a paradigm is a predominant and specific way of explaining reality at a given moment, guiding the practice of researchers, their relations with work, culture and social organization.

As anomalies begin to appear in a paradigm, which compromise the objectivity and accuracy of scientific research and whose solution becomes unfeasible in theoretical terms, a "break" of paradigm takes place and its consequent replacement by another.

Thus, according to Kuhn (2001), scientific revolutions that arise from the crisis of foundations in a paradigm occur, producing the displacement of a prevailing view until that moment and the need to develop new paradigms to guide the research of the scientific community.

In Kuhn's (2001) conception, the constant development of science is due to the anomalies that lead to falsifyingtion of scientific theories and paradigm shifts.

In contemporary society, the complexity paradigm is one of the most important, used in the investigation and understanding of problems related to the scientific field.

However, the issue of complexity is still recent in scientific, epistemological and philosophical thought.

DEVELOPMENT

Complexity is understood as that which is complicated, intertwined, incomprehensible, problematic, obscure, confusing and, therefore, what could not be described. Some of those who recognize this complexity admit that it can find its basic explanation in a few simple principles allowing the almost infinite combination of a few simple elements. However, the complexity paradigm argues that reality cannot be simplified.

In Morin's (2002) conception, complexity must be considered as a challenge or as a motivation to think, which, like simplification, makes it possible to program and clarify. The problem of complexity constitutes, first of all, an effort to conceive an unavoidable challenge that reality poses to the scientist's mind.

Furthermore, complexity must not be confused with completeness either, since the problem of complexity is not that of completeness, but that of incompleteness of knowledge, assures Morin (2002).

In this sense, complex thinking seeks to account for what the different types of mutilating thinking undo, that is, the objective of complexity is to account for the articulations torn apart by the cuts between disciplines, between cognitive categories and between types of knowledge.

Thus, the complexity paradigm does not intend to provide all the information about a phenomenon studied, but to respect its different dimensions.

Morin (2002) argues that complexity emerges as a difficulty and as uncertainty, and the problem is to know if there is a possibility of responding to the challenge posed by uncertainty and difficulty.

The challenge linked to complexity makes us renounce the myth of a total elucidation of the universe, encouraging, however, to engage in the adventure of knowledge obtained through dialogue with the universe.

This dialogue with the universe constitutes the very rationality that eliminates eventuality, disorder and contradiction from the field of scientific research, in an attempt to encompass the real within a structure of coherent ideas. This way, complex knowledge makes it possible to develop the real of each phenomenon in the concrete world.

Morin (2002) assures that the complexity paradigm does not have a methodology, but may have its method based on the idea of "reminder". This means that complexity asks

us to think about concepts, without ever thinking of them as completed or closed, so that we can reestablish the articulations between what was separated and, thus, understand multidimensionality, thinking about the singularity with the locality, without ever forget the totalities that make up all systematic thinking.

Complexity also involves thinking in an organizational way, understanding that this organization is not limited to some principles of order or laws, but the organization needs extremely elaborate thinking. An organizational thinking that does not include the self-organizing relationship, closely related to the environment.

For, for Morin (2002), the aspects of the crisis today stem from the disorganized state of human ideas, dominated by concepts, theories and doctrines produced by itself. Thus, it is essential to face the touching problems of the present day the establishment of dialogues between minds and their achievements built on ideas and systems of ideas.

Complexity is not linked to the phenomenon of the real, but to its own principle.

According to Morin (2002), the physical foundation of what is called reality is not simple, but complex. In this sense, for example, the complexity paradigm argues that the atom is not constituted as a simple substance, despite being an elementary particle, it is not a primary unit that represents simplicity, since it oscillates between being and non-being, and may contain components whose nature is not isolatable.

At the same time, on a macroscopic level, simplicity is also not inherent to reality, as the universe does not present itself in a totally ordered way. What happens in the world is an ambiguous reality, that is, disseminated, but also concentrated, disintegrated, but at the same time organized, thus constituting a complexity that cannot be simplified.

The paradigm of the complexity system, also complex, forces us to unite notions that are excluded within the scope of the principle of simplification or reduction, that is, to it are linked contradictory notions, such as one and multiple, whole and parts, and these notions they are disorganized or organized as the relationship between the subject (observer) and the object (observed system) develops.

This relationship between subject and object is complex, as it establishes a mutual implication and a necessary conjunction between classically distinct notions, assures Morin (2002). The complexity paradigm establishes a relationship between the notions of system, organization, existence and being.

However, this system is also complex because it introduces a complex causality, especially the idea of econautocausality, with self-causality being an external and recurrent causality, in which the organizing process is responsible for elaborating the products, actions or substantial effects to its own generation or regeneration.

According to the complexity paradigm, what at first may seem to be disorder, when analyzed through the complex thought system, can become organized.

Thus, citing the example presented by Morin (2002), at first glance, the starry sky is impressive for its disorder, consisting of a bunch of stars, dispersed at random. However, on closer inspection, the undisturbed cosmic order appears, which can be observed each night, with each star in its place and each planet performing its impeccable cycle.

However, a third view emerges that requires a joint conception of the notions of order and disorder, and for that a mental binocularity is necessary, since one can see a universe that is organized through its own disintegration. Thus, order and disorder or organization

and disorganization are closely linked in the complexity paradigm.

This paradigm contradicts the positivist paradigm in which the researcher places himself in a situation of exemption from reality. The positivist theory, argues Mora (2001), designates the doctrine that is based on the analysis of facts and concrete realities, accessible to the sense organs through empirical experience.

Through the paradigm of complexity, science develops through complex thinking, constituted on the basis of dialogue that is not based on closed theories and doctrines, so the researcher cannot be exempt, as a necessary interaction between the subject and the object of the research is established. search.

According to Freitas (2003) the positivist paradigm has the conviction that reality is objective and apprehensible, considering science as true, positive knowledge, obtained in the midst of controlled conditions through the action of the senses. This perspective ends up separating life and science, acting and knowing, reality and man, denying an interaction between man and the universal organization.

From this conception, it becomes unfeasible to think of research as an encounter between subjects, since the relationship is that of an observer subject who must suspend his subjectivity, through the adoption of neutral attitudes to face an object explained by his relations of cause and effect.

In the field of human sciences, the application of the positivist paradigm becomes more difficult, as the researcher cannot limit himself to the contemplative act of a complex reality, which is constructed based on the idea of the inseparability of order and disorder.

In this sense, Roesch (1999) argues that positivism conceives the social world as something external to man, and its properties must be measured through objective methods, which emphasize the use of standardized data.

According to Freitas (2003), the purpose of the positivist paradigm is investigation, explanation, control, prediction, the formulation of laws and general rules, considering reality as objective and apprehensible, focusing on the relationship of the knowing subject with the object. of research as neutral, independent of values, since what matters in the positivist paradigm lies in the causal explanation, in generalizations and deductive, quantitative analyses, centered on the possibilities of reproducing the event.

Furthermore, Roesch (1999) notes that the positivist paradigm is reductionist, that is, problems as a whole are better understood if they are reduced to the simplest possible elements.

This fact contradicts the complexity paradigm that admits a complex and fragmented reality that cannot be simplified based on general laws, concluded, and the explanation of events is only given through the union of notions that are excluded within the scope of the simplification principle. and reduction.

The phenomenological paradigm, according to Roesch (1999), starts from the perspective that the world and the real are not objective and external to man, but socially constructed, receiving a meaning from the subject himself.

Within this concept, the researcher's objective is not to gather facts and measure the frequency of certain patterns, but to appreciate the different constructions and meanings that people attribute to their experience, seeking to base their behavior.

Mora (2001) explains that phenomenology comprises a "method" and a "way of seeing". Both are closely related because the method is constituted through a way of seeing, and this

becomes possible through the method. The phenomenological paradigm goes beyond the limits of empirical-analytical approaches.

Ommati (2003) argues that the phenomenological paradigm emphasizes the need to recognize that all experience is subject to interpretation, whose dimension can be subjective or objective. Phenomenology seeks to penetrate the situation itself, through a method of clarification that allows the emergence of meanings that can be analyzed and shared, placing itself before all belief and judgment to explore the object in a simple way.in question. But the complexity paradigm does not intend to separate being, existence and life, hiding the richness of the real.

In the phenomenological paradigm, the creation, communication and modification of concepts through processes of social interaction are admitted. Thus, certain aspects of phenomenology converge with the theory of complexity, by admitting reality as something not external to man, as well as the modification of this unfinished, complex reality characterized by movements between the whole and the parts, boosting the movement of order and of disorder.

The structuralist paradigm seeks to explain reality at all its levels based on the notion of structure, says Gil (1994).

Structuralism assumes that each system is a game of oppositions, presences and absences, constituting a system where the whole and the parts are interdependent, in such a way that the modifications that occur in one of the constituent elements imply the modification of each of the elements. others from the set. This system must be constructed in such a way that its functioning can explain all the observed facts.

The structuralist paradigm is opposed to empiricism because, while the latter conceives reality as singular and revealed as a result of sensitive experience, making the object

become what it is, the former maintains that the isolated fact, as such, does not has meaning.

The structuralist conception proposes the observation of facts in themselves and in their relationship with the whole. On the other hand, it requires the immanent study of the essential connections of structures regardless of their genesis or their relations with what is outside them.

Thus, according to Gil (1994), in the structuralism model, one starts from the investigation of a concrete phenomenon, reaching the level of the abstract through the representation of a representative model of the object of study, and then returning to the concrete as a structured reality. This seems to oppose what the complexity paradigm proposes, since it does not intend to dissolve or separate existence, being and life, as well as to dissolve them in systemic abstraction, hiding the richness of complexly organized reality. But, on the contrary, being, existence and life necessarily arise as a result of the development of the complex concept of system/organization.

The paradigm of historical-dialectical materialism holds that the world is dialectical and the essence of dialectical materialism cannot be understood apart from its unity with historical materialism. In this conception, scientific knowledge develops and evolves according to the interests and purposes of science itself, assuming that there is independence of matter in relation to thought and that the construction of thought, as an appropriation of matter, takes place through social practice. Thus, we start to observe the movement and the contradictoriness of the world, of men and their relationships (ESCOBAR, 2003).

Gomes (2003) states that dialectics corresponds to a view that human nature is shaped by social relations that individuals

produce in defined historical contexts. The movements of reality are attributed to the set of concrete relationships that men establish among themselves for the production of their material and social existence. dialectical-historical materialism

The presuppositions of historical-dialectical materialism criticize the static view of reality assumed by positivism and phenomenology, since these hide its dynamic and historical character. Thus, historical-dialectical materialism is concerned with unraveling the contradictions presented by the real, manifested in the conflict of interpretations and interests, to then propose ways of overcoming, in the sense of transforming reality by rescuing its historical dimension.

It can be said that the idea of unraveling the contradictions presented by the real corresponds to the notion of order and disorder, organization and disorganization contained in the concept of the paradigm of complexity.

FINAL CONSIDERATIONS

The complexity paradigm is related to the idea of dialogue, that is, knowledge and the progress of science are only possible through constant dialogue with the real universe. This dialogue, carried out through an organized thought that does not conceive the concepts, theories and doctrines as concluded.

The dialogue of complex thinking between minds and their productions represents the civilization of minds, indispensable to obtain an improvement in human relationships.

The complexity paradigm rebels against the idea that what is complex can be solved through the relationship of continuity and the combination of some simple principles, which make possible the understanding at the same time of the unity and the diversity concerning the human reality. Complexity cannot be simplified.

Complexity involves a mutual implication that is based on a conjunction between notions such as systems, organization, existence and being, which in classical paradigmatic theories such as positivism, phenomenology, structuralism and historical-dialectical materialism.

The complexity paradigm does not intend to dissolve or separate existence, being and life, as well as to dissolve them in systemic abstraction, hiding the richness of the real and provoking its manipulation without control. On the contrary, being, existence and life emerge on the basis of the development of the complex concept based on the play of their interactions with the whole.

In short, it is a paradigm that proposes a complex organization of thought and action, through a new rationality that allows the conception of organization and existence. The organization is not an institution, but a permanent regenerating and generating activity at all levels, which uses the elaboration of strategies, computing, communication and dialogue.

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