

Transdisciplinary thinking as perception of reality and the educational and planetary challenges¹

O pensamento transdisciplinar como percepção do real e os desafios educacionais e planetários

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ABSTRACT

In this text we aim to reflect on transdisciplinary thinking and the possible unfolding of the epistemological principle of transdisciplinarity in the face of educational and planetary challenges. The epistemological principle of transdisciplinarity is based on the understanding of the reality dynamics and its diverse levels through the biophysical and cultural complexity of reality. For this reason, we understand it is through the epistemomethodological principle of transdisciplinarity that one may think of an education which considers our human condition towards a planetary civilization. Based on the interpretative research methodology, we developed the text guided by bibliographical references, having as primary source the thinkers who analyze and deal with this theme.

Keywords: Transdisciplinarity. Reality consciousness. Planetary civilization.

RESUMO

Neste texto, temos como objetivo refletir sobre o pensamento transdisciplinar e os possíveis desdobramentos do princípio epistemológico da transdisciplinaridade no enfrentamento dos desafios educacionais e planetários. O princípio epistemológico da transdisciplinaridade tem como pressuposto a compreensão

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da dinâmica da realidade e dos seus diferentes níveis pela via da complexidade biofísica e cultural do real. Por esta razão, entendemos que é pela via do princípio epistemometodológico da transdisciplinaridade que se pode pensar em uma educação que leve em conta a nossa condição humana com vistas a uma civilização planetária. O texto foi elaborado com base na metodologia de pesquisa interpretativa, com apoio em referências bibliográficas, tendo como fonte primária os pensadores que abordam e analisam essa temática.

Palavras-chave: Transdisciplinaridade. Consciência do real. Civilização planetária.

Initial considerations

We start this text moved by doubts and questions. A question that encourages us to reflect is if, after more than two millennia of philosophical speculations and advances in scientific research, it will be possible to verify and affirm that man is finally facing the ends of knowledge. Are we in the thresholds of deciphering the most powerful forces of our human mind in terms of the ability to know the reality that surrounds us within which we are a part of? The questions make sense after Michel Random's (2002) bombastic and convincing statement when, at the end of the discussions of the 1st International Congress of Transdisciplinarity², he stated that "[...] from now on, *science was in the confines of knowledge*" (RANDOM, 2000, p. 12, author's italicizing).

In relation to this bold statement we are urged to ask: Will man, one day, be able to reach such a stage that allows him to conclude that he has finally reached the last step of knowledge? Which arguments would Random have relied on to express such conviction? Would the perspective of a transdisciplinary thinking have such a significant potential to allow us to glimpse the ends of knowledge? Without the intention to anticipate a response to this problem, we understand that, due to the spirit of human historicity and, consequently, knowledge as a product of the history of humanity, it seems to us that such a claim is still far from being accepted and, moreover, that this goal is and will always be something unattainable.

² The 1st International Congress of Transdisciplinarity was held at the Convent of Arrábida, in the city of Setúbal, Portugal, from November 3rd to 7th, 1994 and brought together the main scholars of this theme, including Edgar Morin, Michel Random, Basarab Nicolescu, Lima de Freitas and Ubiratan D'Ambrosio. The dissemination of the term transdisciplinarity began to be universalized and had great repercussion in the academic circles, considering that the event received support from UNESCO.

Initially, it is important to highlight that, for some scholars of the subject, the field of known as either human or social sciences, had the pretension of a transdisciplinary knowledge since the 12th century. With the advent and establishment of the principles of classical science and Industrial Revolution, and from the modern organization of the scientific thought, a concept of science has been founded by the disciplinarity of knowledge, the specialization of specific areas and the fragmentation of knowledge. This rationality model produced what Morin (2000b) calls the “*paradigm of simplification*”³. Man intended to understand the complexity of the biophysical and cultural world through simplification, ignoring its complex character. Only after the discoveries of quantum physics, already at the end of the 19th century, by introducing the *principle of non-separability* and, above all, with the Venice Colloquium, in 1986, the term transdisciplinarity begins to be delineated within a complex conception of understanding world, man and society. Many thinkers, since then, have worked and disseminated the transdisciplinary thinking. Some of them stand out, such as Edgar Morin, Basarab Nicolescu, Lima de Freitas, Ubiratan D’Ambrosio and Maria Cândida Moraes, who research and incorporate the principle of transdisciplinarity from the new influxes of science.

Transdisciplinarity finds in the theory of complexity one of its main pillars of support. This undoubtedly happens because, in recent years, “The Theory of Complexity is one of the most fertile fields through which contemporary science advances. It is a theory that focuses on understanding, explaining and, when possible and in an approximate way, predicting the functioning of complex systems” (FOLLONI, 2016, p. 113).

The perception of the importance of advancing studies on complexity led Maria Cândida Moraes (2008, p. 95) to affirm that “[...] science has been signaling the emergence of a paradigmatic structure of a complex or ecosystemic nature to explain the functioning of the world and life” and the theory of complexity, therefore, presents itself as “a way of thinking and understanding the dynamics of reality” (MORAES, 2008, p. 125). In any case, the human brain and the field of knowledge are still a matter of great speculation and, to this date, considered indecipherable and, for this reason, in the near future, we might see many advances.

3 Commenting on the principles that command classical intelligibility Morin writes: “I call the *paradigm of simplification* the set of intelligibility principles proper to classical scientificity, and which, linked to one another, produce a simplifying conception of the universe (physical, biological, anthroposocial)” (MORIN, 2000b, p. 330).

The difficulty in operating with a complex and transdisciplinary thinking, according to Morin (2012), is a consequence of a total ignorance of knowledge and the ways we know it. The path of knowledge is marked by the plurality of interpretations with advances and retreats throughout history. Epistemologies arise and are strengthened in the intention of indicating paths that lead to indisputable certainties and truths. Descartes is the philosopher and thinker who gives great leverage to these promises and, when creating his method, described it as a safe way to get to the truth. Certainties and truths, however, will never be or can be fully brought up once they can be achievable and contrastable in time and the recurrence to them reveals how much historicity and current hermeneutics have marked them. Uncertainty, disorder, ambivalence, contradiction, ambiguity and subjectivity were rarely contemplated by the main currents of thought due to their deviant character.

For many centuries, Western models of thinking have operated to simplify what, by nature itself, is complex. The privileged way to access and produce knowledge was often by reducing what is complex into something simple. Modern science, based on the scientific method, promoted and continues to promote enormous technological advances from fragmentation, hyperspecialization of knowledge and reduction of complexity. For this reason, even if it represents a great advance in relation to other traditional forms of knowledge, this simplifying and disciplinary model is responsible for producing the epistemological bases of a way of knowing that does not contemplate all the pretensions of knowledge and, therefore, no longer corresponds to the real challenges that arise to think about the socio-educational and planetary contexts of humanity.

The results and products of the scientific and simplifying knowledge model, admittedly, leave no doubt as to their efficiency. On the other hand, however, it presents numerous limitations and restrictions when it comes to providing plausible explanations about certain contexts and complex realities. Consequently, this paradigm has been criticized due to its epistemological insufficiency in explaining complex phenomena.

If the theory of complexity presents itself as a relatively new field, the principle of transdisciplinarity is something even more recent and emerging. In the *Presentation* of the work “*Education and transdisciplinarity*”⁴ the authors write: “When we talk about transdisciplinarity we are highlighting an emerging

4 This book records the organization and operation of the Center of Transdisciplinarity Studies (Cetrans) and brings together the most important works and texts of the seminar organized by the researchers of Cetrans in 1999.

vision, which is a new attitude towards knowledge, a new way of being” (NICOLESCU *et al.*, 2000, p. 5). This way of thinking is also shared by Moraes and Navas (2015) considering that, according to these authors, transdisciplinarity opens many possibilities and perspectives in the field of school education, both in the sense of dealing with the issue of knowledge and for the awakening of a planetary consciousness.

Transdisciplinary thinking as understanding and awareness of the real

The approach of transdisciplinarity, because it is something recent and difficult to assimilate, brings us to many doubts and, above all, to questions. This is because in its brief trajectory of just over 20 years, the theme of transdisciplinarity still lives a phase of clarification and consolidation and, therefore, raises many questions that have not yet been or that could not be answered convincingly.

Random (2000, p. 17) formulated some of these questions in the following way: “Why is transdisciplinary thinking only perceived by a part of the public? Would it be a science, a philosophy, a metaphysics, a poetics, an art, a methodology, a discipline in itself, a tool or all of this at the same time?”. In our conception, however, these questions need to be preceded by another, of an even more comprehensive character and that can be formulated like this: How can we, human beings, understand the complexity of the real as an intricate web of relationships and interconnections and, consequently, face the challenges that arise in the contemporary world? Anticipating a possible response we would say that it is through transdisciplinarity, based on the principles of complexity, that we can approach the complexity of the real and enable ourselves to dialogue with this complex world.

Complex understanding, through the transdisciplinary route, requires us to be able to refer to the bio-ontological dimension of the real. Referencing the real is not something forged from fictitious data, because, as Morin and Le Moigne (2000) observe, complexity is not in the phenomenal foam and, indeed, it is an inherent dimension to all of the reality revealed in more recent scientific theories.

To demonstrate the paradox between being and thinking and, therefore, how much the complexity should be translated into equations and models compatible with the real, it is worth remembering the question elaborated by Nicolescu (1999, p. 41): “Would complexity have been created by our heads or is it in the very nature of things and beings?”. For these reasons, it

seems obvious to us that, from now on, to live and survive in this world we increasingly depend on an understanding and awareness of the real. Regarding this cognitive dilemma, Demo (2002, p. 185) is emphatic in stating that “If I do not know exactly what the real ontologically speaking would be, much less I know how it would be possible to reconstruct it in the most intelligent way, epistemologically speaking”. The phrase puts us before the deadlock created by the different epistemologies, throughout the history of humanity, in an attempt to dialogue with the real.

The perception and awareness of the real are, therefore, a precondition for establishing a transdisciplinary understanding. Morin, in the book “*Science with consciousness*” makes a comparison between the old and the new transdisciplinarity. He writes:

We need, therefore, to promote a new transdisciplinarity, a paradigm that certainly allows us to distinguish, separate, oppose, and, therefore, relatively divide these scientific domains, but that can make them communicate without operating the reduction. The paradigm that I nominate simplification (reduction/separation) is insufficient and mutilating. It takes a paradigm of complexity, which, at the same time, separates and associates, which conceives the emergency levels of reality without reducing them to elementary units and general laws (MORIN, 2000b, p. 138).

The old transdisciplinarity is implicit in different historical currents of thought that in one way or another sought to perform a reading of the real. It is also confused with attempts at inter/pluri/multidisciplinary approaches that are built on principles that simplify reality. The new transdisciplinarity, however, is an invitation to put thought in the wake of the cognitive principles of complexity through the reconnection of different domains of knowledge and levels of reality. It is new, therefore, because transdisciplinarity acquires a new meaning from the advancement of studies of complexity theory.

Furthermore, according to Morin (2002a, p. 79), “transdisciplinarity is often characterized by cognitive schemes that cross disciplines, sometimes with such virulence that they startled them”. Nicolescu (1999) expands and enriches this statement by explaining that transdisciplinarity reminds us of what is between disciplines, through different disciplines and beyond any discipline, that is, to man himself: man, in the condition of the transdisciplinary subject who creates, imagines, reflects in the condition of indispensable agent to the

affirmation of the transdisciplinary method. Complexity reveals itself in the disciplinary research and is nourished out of complexity, that is, in a relevant disciplinary knowledge there is a reduction and not annulment of complexity.

Transdisciplinarity seeks to overcome the closed universe produced by science, by bringing to light the multiplicity of modes of knowledge production and by recognizing the importance of the reintegration of the subject in the process of scientific observation, since there is a strong interdependence between observer, observation process and observed object. Therefore, thinking about transdisciplinarity implies the reaffirmation of the value of each subject as a carrier and producer of a contextual and complex thought, organized from a reform of thought that enables the proper use of intelligence for a transdisciplinary thinking, since, “[...] transdisciplinarity only represents a solution when it is linked to a reform of thought. It is necessary to replace a thought that is separated by another that is linked” (MORIN, 2004a, p. 20).

Transdisciplinarity is the product of a perception of the real, whose principles are extracted from different contemporary Sciences, especially Biology, Cybernetics and Physics. In Nicolescu’s understanding (1999, p. 47), “The three pillars of transdisciplinarity – the levels of Reality, the logic of the third included and the complexity – determine *the methodology of transdisciplinary research*”. These are considered the three basic pillars⁵ that support and sustain the epistemomethodological principle of transdisciplinarity and they represent a severe punch to the classical view of the world. It is an obvious assumption that for the understanding of something that presents itself as complex it is mandatory to have a complex and transdisciplinary epistemology.

The first pillar of transdisciplinarity indicates to us that reality is made up of different levels, such as the material level and the virtual level. This assumes that we need to take into account that biophysical and cultural reality is multidimensional and that it is a mistake to consider it in a simple and linear way based on a one-dimensional perception. Reality is multidimensional in its constitution. Thus, “The classic real-imaginary dichotomy disappears, thus, in the transdisciplinary view. A Reality level is a fraction of the set of perception levels, and a level of perception is a fraction of the set of the Reality levels. The real is a fraction of the imaginary and the imaginary is a fraction of the real” (NICOLESCU, 1999, p. 73). And this perception of different levels of reality produces and enables different levels of understanding.

5 Due to the characteristics of this article, we will confine ourselves to making a brief explanation of each of these three pillars. In the impossibility of analyzing in depth and weaving further comments on each of the pillars, we recommend the complete reading of the works mentioned which are included in the references.

The second pillar, the logic of the third included, is manifested in the transdisciplinary understanding that is directly linked to the perception of the different levels of reality made possible by quantum mechanics and that allows us to overcome the classical logic of the third excluded. To Nicolescu

Transdisciplinarity is the transgression of duality that opposes binary pairs: subject – object, subjectivity – objectivity, matter – consciousness, nature – divine, simplicity – complexity, reductionism – holism, diversity – unity. This duality is transgressed by the open unity that encompasses both the Universe and the human being (NICOLESCU, 1999, p. 57).

In the reading of classical logic, the axiom of identity and the principle of non-contradiction do not allow the possibility of a third included. Everything is explained and works in binary form or/or not in connective perception and/and. Hence, according to Nicolescu (1999, p. 30, italicizing by the author): “The perplexity produced by this situation is quite understandable: can we affirm if we are healthy in spirit that the night *is* the day, black *is* white, man *is* woman, life *is* death?”.

The third pillar, complexity, is undoubtedly the broadest and that reveals, with greater vigor, the need for a transdisciplinary vision so that we can dialogue with the real. Without the perception and transdisciplinary vision there is no complex knowledge, because the complex means that everything has to do with everything, everything is woven together, interwoven and interconnected (MORIN, 2006). The paths that lead to an understanding of the present world, biophysical and cultural, imply a perception and understanding from the cognitive principles of the complexity theory. Morin, always very cautious when it comes to definitions and terminology, writes: “I call *complexity paradigm* to the set of intelligibility principles that, linked to each other, could determine the conditions of a complex view of the universe (physical, biological, anthroposocial)” (2000b, p. 330, italicizing by the author). Well, if reality is complex and multidimensional, we need to make use of cognitive principles that allow us to produce pertinent knowledge, that is, allow us to access and understand the complexity and multidimensionality of this reality. One cannot exclude the idea of the simple with complexity and nor can one exclude the idea of the complex with the simple, because complexity is the union of the simple with the complex.

These are the basic principles that open the horizon to a complex and transdisciplinary perception⁷. Transdisciplinarity, however, in addition to relying on these pillars that go beyond and overcome some of the principles of classical science, which produces the fragmentation of knowledge, relocates other models of knowledge in the scientific scenario that come from tradition, emotion, sensitivity and the imaginary, highlighting its importance and its role in the construction of knowledge. It criticizes the advances of an increasingly encyclopedic, cumulative knowledge, produced at the expense of the growing impoverishment of the self and the increase in inequality between those who possess it and those who are devoid of it. And Morin, in carrying out this criticism, places as imperative the formation of “[...] spirits capable of organizing their knowledge instead of storing them by an accumulation of knowledge” (2002b, p.18), which opens the door to the constitution of a complex knowledge capable of situating any information in its context.

It is important to clarify the subtle difference between transdisciplinary thinking and practice. Morin, the architect of the theory of complexity, wrote at different times of his vast work that it can be understood, according to the context, as philosophy, epistemology, phenomenon, logic, principle, practice, paradigm and other denominations. In “*Science with consciousness*” (MORIN, 2000b, p. 335), when writing a chapter entitled Theory and method, Morin clarifies that “A theory is not knowledge; it allows knowledge. A theory is not an arrival: it is the possibility of a match. A theory is not a solution; it is the possibility of dealing with a problem”. Thus, a theory, by the mental activity of the subject, can play a function both theoretical and practical.

The transdisciplinary school education and the educational and planetary challenges

School knowledge, in general, is not relevant because it is transmitted to students in the form of fragmented and enclosed contents, in a disciplinary space, without the necessary contextualization. Without the contextualization

6 According to Nicolescu (1999), there are different degrees of transdisciplinarity that can be expressed in different approaches: disciplinary, multidisciplinary, interdisciplinary and transdisciplinary. The degrees of transdisciplinarity are defined from a greater fidelity or a greater distancing from the pillars of transdisciplinarity.

and reconnection of knowledge, the student cannot perceive the bonds among the parties and the meaning of the whole. This means that when studying the parts (discipline) one cannot neglect the whole and that when studying the whole (complex/transdisciplinary) one cannot lose sight of the parts. For Morin (2000a), pertinent knowledge should promote general intelligence capable of referring to the complex, to the context, in a multidimensional way and within the global conception, since complexity implies the union between unity and multiplicity.

If knowledge is something multiple, complex and transdisciplinary by nature (PETRÁGLIA, 2015), we understand that it is the urgent and inescapable task of the school to rethink the conceptions, the style of thinking, the problematization of reality, human and life relationships, as well as the strategies, among others, used and disseminated in the teaching-learning process. In this regard, Nicolescu is emphatic when writing: “The advent of a transdisciplinary culture, which may contribute to the elimination of tensions that threaten life on our planet, is impossible without a new type of education, which takes into account *all* the dimensions of the human being” (NICOLESCU, 1999, p. 131, italicizing by the author). A transdisciplinary culture can only measure where and when school education is able to operate under the principles of transdisciplinarity with a focus on the formation of a transdisciplinary subject.

Transdisciplinarity, required and resulting from a complex look, awakens to the consciousness of the real and indicates that “We must become aware that we share the same planetary destiny” (HESSEL; MORIN, 2012, p. 7). The ambivalence of facts and phenomena reveals, according to the authors, that if the phenomenon of globalization can represent the best of worlds, it carries a potential to be translated into the worst what can happen to humanity. It is because of this potential inherent to the educational process that transdisciplinarity, as a conception and methodological principle, is seen as a constant concern in the epistemological field and in school practices.

It is for this reason that, according to Folloni (2016, p. 101), this attitude translates into an epistemic paradox: “to know it is necessary to reduce, but reducing makes it impossible to know it. Hence is complexity being understood, above all, as a challenge”.

Cognitive operations with transdisciplinary bias also presuppose discomfort, uncertainty and especially confrontation. It is from the confrontation among the disciplines that we obtain, for example, new data that, articulated within itself, results in an expanded view of ecology, system and reality. The transdisciplinary vision is structured over the dialogue, over the discussion that enables the shared understanding, the respect to the otherness of the other and

coexistence on the same planet Earth. At no time is transdisciplinarity concerned with the accumulation of knowledge. It seeks, in fact, the constant transformation of ideas, the continuous reorganization of knowledge so that it is necessary to institute “a way of knowledge capable of apprehending objects in their context, their complexity, their whole” (MORIN, 2000a, p. 14).

The promotion of transdisciplinarity, according to Morin (2002b), is always dependent on communication between the kinds of knowledge without operating, however, reduction and fragmentation. Every reduction is mutilating and goes against everything that proposes complex and transdisciplinary thinking that, when studying the whole, does not lose sight of the parts and when studying the parts does not neglect the whole; and that while it separates, it associates. It is necessary to be careful, however, so that the transdisciplinary movement does not annul, deny or erase the disciplinary approach because, in the words of Morin (2004b, p.115), “One cannot demolish what the disciplines created; you cannot break all the closure; there is the problem of discipline, the problem of science, as well as the problem of life; it is necessary that a discipline be both open and closed”.

Likewise, transdisciplinary knowledge does not aim to find the unitary principle of all events, because this would end all the diversity and multiplicity of faces of what is real, ignore the emptiness, the uncertainties, it would annihilate the principle of communication. Nor does transdisciplinarity aim the totality, the completeness of information about a studied phenomenon. What it seeks is the respect for the different dimensions of the studied object, because only in this way can it maintain a principle of incompleteness and uncertainty inside. Thus

although transdisciplinarity is not a new discipline or a new hyperdiscipline, it feeds from disciplinary research, which, in turn, is enlightened in a new and fruitful way by transdisciplinary knowledge. In this sense, disciplinary and transdisciplinary researches are not antagonistic, but complementary (NICOLESCU, 2000, p. 12).

According to Morin (2006, p. 50), for the parameters of transdisciplinarity, the “[...] current framework where myriads of data accumulate in the increasingly narrow and closed disciplinary alveoli” is something unacceptable and, to this end, seeks to promote reflection on the importance of the relations between the contents of a discipline and another, the overcoming of the boundaries between the sciences, in favor of the construction of a plural, global, multidimensional,

integrated and integrative knowledge⁷. Likewise does Nicolescu (2000, p. 11) who understands that “For the classical thinking, transdisciplinarity is absurd because it has no object. For the transdisciplinarity, however, classical thinking is not absurd, but its field of application is considered restricted”. According to the complex and transdisciplinary thinking, the problems, challenges, new and unprecedented emergencies are the ones to induce the sciences to study them, allowing the opening and the flow among the different areas of knowledge and with the connections, interactions and implications that may occur between one area and another, breaking with the stigma that certain disciplines may be the foundation of others or more important than others.

In his latest book, “*Teaching to live: a manifest to change education*” (2015) as in many of his publications, Morin resumes, deepens and expands, with new nuances, some of his main concepts. In this work, to keep only one example, he uses, for the first time, the term *anthropocene*⁸ to characterize the effervescence of current history that places us as members of a planetary civilization. According to him, we are living in an “[...] era simultaneously anthropocene, from the point of view of the history of the Earth, and planetary, from the point of view of the history of human societies” (MORIN, 2015, p. 10).

Through transdisciplinarity, the path is opened to the understanding of our condition of planetary globalization whose objective is to awaken to the consciousness of our planetary destiny. In any case, the purpose of planetary education, by putting ourselves on the path of understanding that we are part of the same planet, is to awaken ourselves to a world-society, considering that “[...] we realize that we are lost in a story full of noises and horrors, exposed to the uncertain future of humanity. The globalized planet has not produced ‘world society’, supportive and fraternal” (MORIN, 2013b, p. 174).

After years of dedication, study and research on science and the theory of complexity applied to different contexts, Morin, as well as other authors who focus on this theme, argue that: “The mission of education for the planetary era is to strengthen the conditions of possibility of the emergence of a world-society

7 To Mariotti (2010), the expression “integrative thinking” is equivalent to “complex thinking”. He preferably uses the expression “integrative thinking” to “complex thinking” at the human resources and business leaders Post-Graduation at the Business School São Paulo – BSP. The school maintains a partnership with a group from the University of Toronto (Canada), which also prepares executives through MBA and has created an integrating thinking center that uses complex thinking applied to business.

8 The term *anthropocene* was created by Paul Crutzen, winner of the Nobel Prize in Chemistry and received great strength after 2008 to indicate the latest era in the History of planet Earth.

composed of protagonist citizens, consciously and critically committed to the construction of a planetary civilization” (MORIN; CIURANA, CURANA; MOTTA, 2003, p. 98). And, therefore, these authors ratify that, as humanity is a planetary entity, the main goal of education “is to educate for the awakening of a world-society” (2003, p. 63).

If the educational community takes this mission seriously, the school can coordinate a pedagogical project of transdisciplinary bias that promotes a structuring mediation of the pedagogical process by adopting strategies that favor transpersonal, cross-cultural and transnational development. The challenge of school education is to provide the new generations with an understanding of human totality in order to make this world a Homeland for all with the perspective of a planetary civilization. For this to happen it is necessary to understand the process of genesis and the development of human History from the beginning to the current anthropocene and planetary era. Knowing the earthly, cosmic and planetary identity is indispensable for the human being to understand himself and understand the humanity to which he belongs. This specificity of the human subject demands the school “to teach the human condition” (MORIN, 2000a) as one of the essential knowledge to the education of the future.

These are the great challenges for school education in the planetary era: to provide an understanding of the multiple identities that integrate not only the identity of the Brazilian people, but of all the humanity that inhabits the planet Earth through a curriculum that leads the student to know and value their ethnic origins and to recognize themselves as citizens of a Homeland for all. This global perspective and this planetary consciousness, according to D’Ambrosio (1997), can hardly be obtained outside the scope of transdisciplinarity, because transdisciplinary knowledge is transcultural, transreligious, transpolitical and transnational in its essence. It is important to bear in mind that “[...] closed rationality produces irrationality. It is evidently unable to meet the challenge of planetary problems” (MORIN; KERN, 1995, p. 95). The uncontrolled adventure of technoscience and the advances of nationalist civilization may be at the grounds of the worsening barbarism.

The human condition in the world, from recent history, discovers itself and becomes a condition of the planetary era. The awareness of this new era is fundamental and is requiring a new model of thinking to awaken anthropological awareness, ecological awareness, civic consciousness, spiritual awareness of the human condition as unity and diversity represented in the trinomial individual/species/society.

The planet requires a polycentric thinking capable of pointing out the universalism, non abstract, but conscious of the *unity/diversity* of the human condition; a polycentric thinking nourished from the cultures of the world. Educating for this thinking is the purpose of the education of the future, which must work in the planetary era, for the earthly identity and consciousness (MORIN, 2000a, p. 64-65, italicizing by the author).

The construction of a planetary citizenship is also a constant agenda in the works and conferences of the Brazilian philosopher and theologian Leonardo Boff (2003). His works make the apology in support of a more cooperative and solidary globalization, which contemplates and defends all forms of life existing on the planet; the interests of peoples, respecting their traditions in order to promote the integration of the human cultural diversity, and a solidarity economy as a way of collaborating to reduce the perverse effects of socioeconomic differences.

Final considerations

According to Nicolescu (1999, p. 40), “Edgar Morin is right when he points out at all times that knowledge of the complex conditions [is a] *a policy of civilization*”⁹. And a great challenge facing the current education is undoubtedly to create, through transdisciplinarity, a civilization of planetary range that, based on intercultural dialogue, gets closer to the individuality of each one, to what concerns the wholeness of the self. The great purpose of the perception and the transdisciplinary work is to ensure the formation of a subject with an individual, cultural, social, cosmic and future identity, that is, of a planetary citizen who recognizes the Earth as a Homeland and, consequently, recognizes himself as a fellow citizen of all the other peoples.

The Charter of Transdisciplinarity, drawn up in 1994, among other considerations, in its 8th article, considers that:

9 Edgar Morin, at the age of 80, was honored by UNESCO with the title of a planetary *humanist* in recognition to the great work of this French contemporary philosopher in favor of a planetary civilization.

The recognition of the Earth as our home is one of the imperatives of transdisciplinarity. Every human being is entitled to a nationality, but as an inhabitant of the Earth is also a transnational being. The acknowledgement by international law of this twofold belonging, to a nation and to the Earth, is one of the goals of transdisciplinary research (CARTA DA TRANSDISCIPLINARIDADE, 1994).

It is in the nature of the transdisciplinary perception a posture of cognitive democracy that takes into account the different types of knowledge without cultivating prejudices and hierarchization in relation to knowledge. The overvaluation of the field of Exact Sciences, in detriment of the Human Sciences and other types of knowledge has already been criticized by Morin (2000b) and many other thinkers.

Through the epistemomethodological principle of transdisciplinarity it is possible to give a new pedagogical direction to the school education process that takes into account our planetary identity. Fragmented knowledge prevents a cosmic and planetary consciousness. And we can no longer ignore that “The world increasingly becomes a whole. Each part of the world is more and more a part of the world and the world as a whole is increasingly present in each of its parts” (MORIN, 2000a, p. 67) and this, in Random’s conception (2000, p. 42-43) means that “at least at the conceptual level, there is only one Whole, only one tree of Knowledge, only one East-West”.

The transdisciplinary understanding, perspective and approach represent a challenge, but they can also mean a great advance in relation to the process of knowledge with reflections on the action of teaching and learning and, consequently, in the educational process. In Nicolescu’s understanding (1999, p. 76), “Transdisciplinarity is a widespread transgression that opens up an unlimited space of freedom, knowledge, tolerance and love”.

When concluding, it is important to record what Morin writes in a warning tone: “Our fragmented mode of knowledge produces global ignorance. Our mutilated way of thinking leads to mutilating actions” (2013a, p. 183). The transdisciplinary epistemological understanding, therefore, is presented as a theoretical-practical presupposition to think over and enable a community of common destiny, a world-society, a planetary concitizenship or even a Homeland of all. Transdisciplinarity, the product of a *made up mind*, is required as a (pre) condition and foundation for an awareness of the real and, consequently, to constitute the knowledge that can safeguard the planet Earth and promote a planetary civilization.

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Text received on 04/15/2019.

Text approved on 04/07/2020.