

## Education through the teaching and learning of reading in the light of complexity and transdisciplinarity



<https://doi.org/10.56238/uniknowindevolp-035>

### Edney Gomes Raminho

Doctor student in Education from the Catholic University of Brasília (UCB), Master in Education from the same institution; specialization in Portuguese Language and degree in Letters from the Pontifical Catholic University of Minas Gerais (PUC-MG); postgraduate student in Neuroscience, Education and Child Development from the Catholic University of Brasília.

E-mail: [edygomesraminho@gmail.com](mailto:edygomesraminho@gmail.com)

ORCID: <https://orcid.org/0000-0001-9615-1142>

### Luiz Síveres

Post-doctorate in Education and Psychology from the Pontifical Catholic University of São Paulo. PhD in Sustainable Development from the University of Brasília. Master in Education from the Catholic University of Brasília. Degree in Philosophy from the Pontifical Catholic University of Paraná. Specialist in Cooperative Learning and Educational Technologies from the Catholic University of Brasília and Specialist in Jungian Psychotherapy from the School of Health of São Paulo. Currently, he is a Permanent Professor/Researcher of the Master's and Doctorate Program in Education at the Catholic University of Brasília. Author and organizer of books, publication of chapters and articles. Leader of the Research Group at CNPq: Dialogue - a transversal pedagogical process and Productivity Researcher (PQ2).

E-mail: [luiz.siveres@gmail.com](mailto:luiz.siveres@gmail.com)

ORCID: <https://orcid.org/0000-0003-4735-6066>

### Idalberto José das Neves Júnior

Doctor in Education from the Catholic University of Brasília (UCB), Master in Knowledge Management and Information Technology from UCB. Coordinator of the UniUBEC Corporate University. Professor at the

Catholic University of Brasília - UCB. Researcher of the Research Group Diálogo: Um Processo Pedagógico Transversal (DPP). Researcher UNESCO Chair in Youth, Education and Society at UCB. Author of the book *Is It Possible to Be a Good Teacher? Ecosystem Thinking in Higher Education*. The topics of study in the area of education are related to teaching and learning processes, complexity theory and ecosystem thinking.

ORCID: <https://orcid.org/0000-0002-2241-9756>

### ABSTRACT

This study reflects on the contributions of the theory of complexity and transdisciplinarity in education through the teaching and learning of reading as a way to deconstruct the fragmentation of knowledge that has been installed in education. It starts from the justification that, in this way, the teaching and learning of reading become a means to sustain the energies invested in education, converging knowledge and reading strategies in meaningful learning, while articulating the school to the stories of the participants in the teaching and learning process inside and outside it, assuming itself as learning of sensitive understanding of the realities of the subjects for life. A bibliographic study of the guiding threads of the two theories for the teaching and learning of reading based on the language sciences is made. As a contribution, the results point to an encounter of complex thinking and transdisciplinarity to teach and learn to read as a path to an emancipatory and citizen education committed to ecosystem relations.

**Keywords:** Teaching and learning of reading, Ecosystem education, Recreation of reading.

## 1 INTRODUCTION

The fragmentation of the Basic Education curriculum into disciplines has installed the culture that the teacher can develop its content in isolation. Each specialist works his planning without considering the possible relationship between the knowledge necessary for the discipline he teaches and the other constitutive disciplines of the curriculum. This issue has already been discussed by Morin



(2005) in what he calls superspecialization. It consists of one of the negative traits of scientific development in education, with worrying effects on training.

What's worse is that it convinces so much that

we end up believing that the artificial boundaries between disciplines are boundaries that correspond to reality; We are facing a first illusion. Here, however, lies the great success of science. [...] We develop manipulation techniques in all domains, forgetting at the same time the reality of living beings, of human beings (CYRULNIK; MORIN, 2012, pp. 13-14).

And so, the logic of separation, of isolation, historical marks of the scientific technical development of the last centuries have been incorporated into the mercantile model of education. A contradictory of direct interference in the principle of ecological science of interpellation between knowledge and the pre-existing dialogue to scientific knowledge itself.

Thus, since there is no proximity and a dialogical fabric between what the disciplines propose and the demands of social life, the student himself feels divided from his culture, from his history, from society, from himself, from reading himself and from understanding himself. Students get lost of what education is and what is expected of them as human beings in the feedback they could have of the present as a harbinger of the future. There is a sprawl of isolated lines, forming vicious circles separated and closed in on themselves, of a doing without knowing why and for what.

With this addiction, learners are at the mercy of understanding the complex reality of the contemporary world and its reflections in school. Mismatches tend to be even more overwhelming chaos in the digital age. It's a lot of information simultaneously. And not knowing what to do with it can lead to even greater distancing from the necessary and vital relationship: man, nature and society. The possibility of getting lost in the labyrinthine tangle of information of the digital age can be greater and more catastrophic because it does not find itself, and even less because it does not recognize itself as a member of civilization itself. Just one more in the middle of a lot of things.

An abyss of impediments is created for educators and learners to feel and understand how the phenomena of their history work and interact. The historical mismatches of abrupt flows of information end up mischaracterizing this vital need to seek in the culture of history itself a means to recognize, understand and value what they know and from there to move towards increasingly sophisticated flows of knowledge. With this, the inertia of knowledge reproduction ends up being a naturalized behavior.

Spreading this vice, schooling is being woven contrary to the goal that it itself strives to achieve, which is to form thinking individuals and agents aware of their own knowledge. Namely, when the apprentice arrives at the labor market, he has a shock. The learning there, demands, intertwines, articulates and is articulated by the experiences fundamental to the profession that is intended to build. The professional who excels is the one who (re)creates. The (re)creative action is shown to be an expertise woven daily by the experience that, being lived, is also being matured and perfected.



It is impossible that by the surveys of reading income of Brazil in Pisa 2015 (BRAZIL, 2016) as well as by the data of the Anísio Teixeira Institute (Inep) on the school flow in Basic Education (BRASIL, 2017), the educational realities have gone to different paths of the maturation of experiences. Thus, among other fundamental elements of education, the introductory objectives of the National Common Curricular Base (BNCC) are questioned, which are:

Valuing the diversity of knowledge and cultural experiences and appropriating knowledge and experiences that allow you to understand the relations of the world of work and make choices aligned with the exercise of citizenship and your life project, with freedom, autonomy, critical awareness and responsibility. It sounds ironic, but the justification is that this is how life works. There is a predetermined professional profile. In view of this, the student/professional needs to prepare for another way of acting in history (BRASIL, 2018, p. 9).

By market need and only for this, the student is challenged to redo what was unfound in the course of an entire school experience. He needs to go through the necessary rupture of paradigms and the way of (un)learning, compromising him the recognition of teaching and school learning as tasks of and for social relations. A scenario of amplitude of inequalities and exclusion of access to citizenship by reading education of ruptures and fragmentations.

And while this paradoxical cycle is not broken, the overwhelming chain of social and planetary imbalances tends to spread and, just as worse, to consolidate itself as something naturalized. For example, a young man who has graduated from a castrating perspective of his reading creativity, and thus has convinced himself, will possibly repeat this practice with the peers he will also form.

As Morin and Díaz (2016, p. 76) point out, "the disciplinary organization of knowledge today prevents us from forming a thought capable of facing the fundamental problems of a global nature." In an attempt to be ultradidactic, teaching is summarized to the extreme and causes ruptures with significant obstacles and aggravating factors in the integral formation of the being.

With so much waste of energy, the action of the teacher ends up being a doing of things, adding to other deficiencies and dialogical limitations for citizen formation: we see garbage dumps full of paper and baskets full of unused books, because triennially the textbooks are replaced. Meanwhile, computer labs are in many cases unused in public schools, even if there they could converge and dialogue a series of knowledge of the disciplines of the curriculum.

This nuisance has historically crept into education. And it has been the object of transdisciplinary studies as pointed out by Moraes and Navas (2015, p. 132-133): "If we look at the material functioning of any school, we can see that everything is organized so that children have to buy different books and books every year for the following year." Everything becomes crowded in dumpsters and dumps, contrary to the logic of the sustainability of knowledge.



Given so many mismatches, a space is opened here to reflect on: to what extent can the theory of complexity and its guiding threads in the theory of transdisciplinarity dialogue and feed the formation of the ecosystemic citizen reader at school?

This question invites us to seek in the theories of complexity (MORIN, 1996; 2005; 2014; 2015) and transdisciplinarity (NICOLESCU, 1999) meetings for dialogue with the teaching and learning of reading (SOLÉ, 1998; Kleiman, 2000; 2004a; 2004b). A bibliographic review study of an exploratory descriptive-explanatory nature (GIL, 2017) of principles of reading processing for teaching and the dialogue of these with complexity and transdisciplinarity theories is made. Given the density and amplitude of the latter, the following meeting points were selected from them with the processing of reading reading: uniduality of being; self-eco-organization and self-eco-formation; levels of reality and the concept of third included. Through this methodology it was possible to identify the existing dialogue between the three theories in order to provoke the reflection of a teaching of reading as a complex and transdisciplinary activity, through which one can develop the reading autonomy with a view to an ecosystemic citizen formation.

## 2 THEORETICAL ASSUMPTIONS

### 2.1 FACTORS ALLIED TO READING AND THEIR CONSEQUENCES IN TEACHING AND LEARNING

According to Solé (1998), reading is a process of construction of meanings from which the active reader, the one who processes and understands what he reads, can form a model of representation for his or her reading autonomy. For this, the learner must be motivated to the freedom to walk through what he reads in order to feel, to (re) know the dialogue of knowledge to which he is being presented.

This model is constructed by the reader since reading is for him a rewarding emotional experience, favoring his learning in a dialectical relationship, given that the text is responsible for only a part of the information necessary for meaning (COLOMER and CAMPS, 2002). The reading directs the reader to fundamental discoveries with a world that until then was unknown or limited to him. Thanks to the ideas of what is there in the writing or in the tracing of what surrounds him, the one who reads awakens discovers knowledge and learning situations, building and deconstructing meanings.

Understanding what one reads goes through the technical sieve and feeling, sensitization, which goes beyond understanding. It is also to understand and be touched, mobilized, driven to put into action what of reading is resignified by the reader. It is a complex cognitive, social, historical, dialectical and structural process.

There are even movements in this circuit that are not always put into clear action by the reader. Namely, for example, when it comes to the reading of a fictional or philosophical text, in which the reflective developments gain dimensions beyond the text and transcend the space of textuality. The



text is only the tip of the iceberg, as Koch (2006) metaphorizes. As much as it is put, the meaning does not end there. As cohesive as a text may be structurally, it may still not make any sense to the reader if there is not something in common between what it offers of information and what the reader also brings with it prior knowledge.

The comprehension passes, in this way, by the relationship that author and reader establish as one reads (KLEIMAN, 2004a; 2004b). For the author, it is a situation that involves a range of factors, which makes the process of reading very complex and sophisticated. In her studies, she highlights the social and cognitive criteria of reading. As for the cognitive aspects, until the consolidation and fixation of the sense, the information passes through the short-term memory also called immediate memory or even working memory, through deep or long-term memory and, finally, through shallow memory, where the definitive records go through a stage of alertness, accessibility, state of consciousness (KATO, 2007). That is, here the data transitions from a state of something unknown, unexpected to something known. When it reaches long-term memory it is already considered old data. But, it remains in alert condition in order to be associated with new information.

Immediate memory is limited to the capacity of 5 to 9 elements. The more completely new information, or of little effect of meaning a text offers to the reader, the less the memory will register. What seems meaningless doesn't even take up space in the memory. Therefore, for a content read, to remain in long-term memory, in a first contact, it is important to make combinations, choose strategies of approximation with the reality of the reader, facilitating the storage in memory and, in turn, the (re) construction of meaning.

Therefore, the more significant a new information is known to the reader, the more it tends to remain in his memory and to be resumed, being part of the ideas and representations of meaning that this reader will (re)create. One of the possibilities for this to happen is in the connections and webs that the reader can build from his knowledge with the new situations and information in learning. And for this, the teacher needs to have clarity of this expertise so that the goal that he offers by reading promotes the creativity that the learner will (re) discover as he reads.

Learning to read is, then, an activity of recreation of a reality and information already understood. While the mature, proficient reader feels at ease, sure of what he reads, he is also urged to give new meanings, to establish new relations of meaning to what is already consolidated in his memory. The written text and the forms of expression of the language for it, therefore, are invitations to the challenges of his creativity. In doing so, the scope of understanding narrows and broadens.

From a sociocognitive-interactional perspective (KOCH and ELIAS, 2006, p. 12), "reading goes beyond the spaces of letters". For the reader to construct meaning to what he reads, it is necessary that they ally themselves in the processing of reading knowledge shared with the author, including about the roles that each of them represents in that situation of production of the text in reading, their



objectives, the historical time in which they live when they read and write. The more the reader can associate what he knows with what is new to him, his understanding and (re)construction of meaning tends to signification. With this, greater is also the condition to activate hitherto unknown data and make them part of your knowledge framework.

And many other knowledges of different scopes can then be imbricated, combined in an intercession for the reading to occur successfully: the subject, the linguistic choice, the structure of the text, the morphosyntactic aspects, etc. In this way, there are many openings so that, from what is common, the learner can expand his reading apparatus and exquisite his (re)creative potential.

This set leads to understand that "reading is an interactive process, in the sense that the various knowledge of the reader interact at all times with what comes from the page to reach understanding" (KLEIMAN, 2004b, p. 17). And, therefore, one cannot consider the act of reading as a linear process. The circuit involved there constitutes a complex mosaic in which fundamental knowledge is situated and revealed to the challenge of seeking autonomy to which the learner is invited by the teaching and learning of reading as significant activities for his life.

The qualities of a text and its comprehension are linked, therefore, to the most diverse encounters, opportunities and challenges of reading and approaches underlying it. Factors that offer even conditions for understanding aspects of the structure as well as the functioning of interpersonal relationships. Thus, the richer a text is in terms of these aspects, the more it tends to contribute to the quality and refinement of the reading that can be applied to it. The reader tends to apply and develop increasingly sophisticated strategies, urging him to autonomy and security in the face of the challenges of the most distinct situations of writing and reading.

Thus, the learner develops techniques and learns to use them, imprinting the knowledge necessary for the effectiveness of the meaning he produces and of that which he can also, in a production situation, establish with the reader. While he reads effectively, he assumes for himself norms and expertise for the very framework of speaker/listener, reader/writer.

To do so, prior to reading, the reader must have described the objectives he wants with what he reads (SOLÉ, 1998). Reading meaningfully depends directly on the clarity of the objectives proposed for a reading: to entertain, to inform, to question, etc. Done in this way, the reader is aware of the reasons why he is reading, which makes his task of understanding more accurate and dynamic. This then represents for him a task of interest, because he is aware of the role of the text in the immediate moment he reads and the unfolding of the post-reading meaning.

When choosing a text/event or classroom work, you need to project the learning expectations that it can raise. There is a prospecting activity that must be taken into account. To do so, the educator must have gone through the experience of understanding the importance of this selective process of criteria to then convince the student. Here there is another reading action coming from the teacher that



is extremely important: reading your student, the world, the expectations and interests of reading that your student draws and projects by the actions of participation in the school.

The experiences shared there, in some way, will be resignified in culture and history. They will strengthen your bond with reading, with learning relationships and with the variety of forms of manifestation of this in the texts. It is clear that in this process of applying reading strategies focused on issues beyond the text, the reader is applying and developing their cognitive reading skills. This is one of the justifications that mobilize the works of Kleiman (2000, 2004a, 2004b) and Colomer (2007), the latter highlighting the socio-affective and cultural issues of reading, from which the subject can act in social decision-making, be sensitized to reality, participate or exclude themselves or be excluded from social groups. With this, it is highlighted that it is one of the commitments of schooling and reading in this space. School and society are extensions of discourses, therefore, of readings and application of the knowledge formed in these extensions.

Reading with excellence considers author/reader as historical beings, plural and formed from the complexity of thoughts, cultures. This emerges from a culture of valuing teaching for society and from this for each of the readers who are being trained in school and in life. A culture that has in school one of its hopes. Therefore, the continuing education of mother tongue teachers has a prominent place in this case. It is urgent that situations of reflection and intervention be thought for the language educator, in a holistic perspective of knowledge. A way of thinking and forming to act transcendent of the content itself.

The theory of language therefore calls for a garment to which various extensions are aligned tongues. Language as a phenomenon of manifestation of being invites a look and a way of thinking about its functioning in a complex way. In fact, the very phenomenon of language updating brings with it complexity. Because innovative forms of communication are born, reached and perpetuated to meet the needs of historical subjects in the face of the time/space in which they find themselves.

The dialogue needs to extend to a slightly denser scope of discussion, deepened in the historical, dialectical dimensions of the multiple knowledges constructed by the human being and their unfolding in self-ecoformation. Thus, in the sequence, the invitation to the discussion involving the theory of complexity and transdisciplinarity is opened. It is presumed that there are between them and from them for the discussion woven about the teaching of reading, meetings of reflection, dialectical comprehension in which the reading formation is circumscribed. And, from this to reading as a space for criticism and reflection from reader training to ecosystemic citizen formation.

## 2.2 COMPLEXITY AND TRANSDISCIPLINARITY FOR READING

Due to the very nature of coming and going of the theories of complexity and transdisciplinarity, the following points were delimited here whose dialogue transversalizes the reading



education: the uniduality of being (MORIN, 2011); from this to self-organization and self-eco-organization (MORIN, 1996; 2015) and the link of these with what the author characterizes as "the head well made" (MORIN, 2014); what Morin and Díaz (2016) discuss as Thought Reform, in some suggestions of educational interventions, convergent in the teaching and learning of reading in definitions of levels of reality and third included (NICOLESCU, 1999).

These theoretical encounters start from the circularity of life, of the reports, stories woven in the unfolding of the ethical commitment that the transdisciplinary teaching subject has with the course of his history and of the stories that with his (re) meet and (re)build. Paths by which the possibility of universalization of knowledge is opened for the individual, collective and ecological (re)construction with the contribution also of art in the formation of knowledge.

Starting from this understanding, Moraes, Navas and Mendes (2014) organize a set of experiences on the value of life stories and how they exemplify transdisciplinary knowledge. Transdisciplinarity understands that stories, experiences and their representations are not trivial events. They give and portray the meaning of being of a person, of the science that underlies it, bring at its core what has been learned and what needs to be built in subjective learning in order to understand being as an epistemological being. In this perspective, the reports and other forms of manifestations and representations of personal history invite us to read, understand and dialogue with the learning subject. In personal narratives, cultural, social and ideological representations are traced from history that end up being pointed out or erased. And so the pointing or erasure also awakens the interpretation of a reader, educator attentive, proficient, sensitive and desirous of knowledge of the students to re (create) paths of joint learning.

By opening up to the student's expression, the educator can observe, analyze and understand the reality of his learner and think how to contemplate and appreciate it in class. In it can be highlighted points to be worked or not. The history of the learner is situated as a motto to reading by specific methodologies with requirements of the creativity and expertise of the educator.

There is, therefore, how to introduce the learning subject into the world of reading by his own history. Oral or written histories, painted, drawn, staged, recreated, etc., are ways of offering the subject's encounter with himself and promoting encounters with other subjects, other realities and their unfolding in new and inexhaustible experiences and contributions for future generations. Such situations make up the roll in a recreational box for teacher-student integration.

Understanding what one reads requires the reader to establish *links* from what is built into their reading memory with what is new. In these there are aspects that bring them closer and distance them. Converging and divergent points. Interwoven knowledge of a tangle of circuits coming from the most varied learning contexts. Thus, a series of interstices of worlds that intertwine so that reading adds meanings to the dialectical and dialogical formation of the subject is brought to light.





The coming and going of information takes place, therefore, in the scope of the diversity of forms of manifestations that are there being reconstructed by the reader's memory. Part, sometimes represented by words, and part inducible in words, demonstrated by other linguistic modalities by images, colors, sounds, flavors, etc.

Even before meaning, reading needs desire and a goal, it needs to find the reader. This relationship is (a) linear. There is a whole set of other stories, other images, other knowledge to arouse affection for the text and capture attention and curiosity. The reader himself can unravel in which world he is situated and feels at ease, free to be who he best understands himself to be.

For this reason, the teaching and learning of reading are understood here as complex processes and by which transdisciplinary phenomena are circumscribed, since they are concomitant with them the meaning, the resignification, the recreation of realities, of meanings. Given the understanding and the particular appropriation of meaning, the reader dialectically and dialogically constructs his knowledge, interpreting and creating intra and intersubjective possibilities of identification, not to a given reality, but one inaugurated subjectively, which remains in the shallow memory at his disposal.

This interpretation of the process of representation, association and appropriation of meaning by reading ends up unfolding in what transdisciplinarity defines as the logic of the included third (NICOLESCU, 1999). More specifically by the spectrum of Levels of Reality, which are conditions, stages in which knowledge is maintained until new knowledge is added to it, thus unfolding into new levels of knowledge. The third included is, from this perspective, an articulator of knowledge, originating a new scope of representations whenever the reading creativity needs to seek it in memory. This can even extend, validate or even deny the knowledge initially constructed.

Nicolescu (1999, p. 64) illustrates that the role of the third party included.

In the new transdisciplinary model of reality it is not so surprising. The words three and trans have the same etymological root: 'three' means the transgression of two, which goes beyond two. Transdisciplinarity is the transgression of duality [...].

That is, the representations that the subject makes are not exhausted in themselves, not even in their implications in and about the other. By the idea of transposition, meaning and feeling go far beyond the object and things. It starts from a logic of the perceptual transcendental of the sciences and of reason itself.

As for reading, the logic of the included third is an immanent construction to the process of (re)meaning. Comprehension is not an accumulation of information, if only because that would negate the very nature of reading memory. It is a *trans-figuration of* knowledge and embodiment of identification and situates (action) of the reader/co-author with the experience already built and the one under construction. Thus, reading comprehension is par excellence a (re)creative process.



Because of this bias, reading is included as a transdisciplinary process given intersection and the breaking of a series of webs, epistemological opening of the autonomy – self-organization – thinking of the subject. The action of reading is done in and of the configuration of a paradigm. It is a process of transpositions of a reality into so many other levels of reality

And with this, there are communions and concomitant new constructions of feeling and meaning in reading. The object of knowledge can, in the transfer of the included third to the levels of reality and vice versa, gain the corporeality of other objects and of these as representation and resignification by the subject and of their forms of identification. Thus, a very sophisticated gear of reading is built as a transdisciplinary phenomenon in the ontology of being.

Therefore, transdisciplinarity is presented here as an opportunity to intertwine the imaginaries of the learner/reader in their convergences and divergences of readers and (re)creations of realities. It opens up to the plural inclusion of learning manifestations. From a transdisciplinary point of view, the present is seen as a learning path. What one learns is to use and live the now, the consciousness of the future is built in the present. It makes the resumption, the reconnection, the integration of history and the landmarks that resignify it in the facts and creations of life.

In this line, Nicolescu (1999) and Morin (2005) discuss that what is learned or not learned, what is built or not in the learning process has roots in culture, is unfolded in the course of time and history. By this view, the being, its history and the society that represents it and is represented by it are intermittent mosaics of (re) actions from the sharing of cultures to the (re)construction of stories. And so, teaching and learning are constructions of culture. They are representations defined within the interactions and discussions disseminated by scientific productions on the subject. These are interpreted, sometimes imposed and reproduced in the school space.

These perspectives invite the educator to sensitize to potential knowledge as the one who learns.

Is

[...] a different way of approaching the construction of knowledge, the reunion with the epistemic subject, of perceiving human existence and, above all, education. It implies in learning to work in education an inclusive logic, an open rationality that transcends the disciplinary fields [...]. (MORAES; NAVAS, 2015, p. 91).

There is, moreover, the need to take the teaching and learning of reading as an epistemological principle in which the knowledge of the encounter of the subject with his knowledge for the collectivity, one being part of the other, is primated. In such a way, teaching to learn to read "invites both the educator and the learner to experience more elaborate, more sophisticated ways of thinking" (MORAES, 2008, p. 120) through a circuit of resignifications of their knowledge. In this resignificant path, ways of thinking and learning are (re)inaugurated, supported by a construct of representations,



meanings, socializations of subjectivity for otherness by the sustainable feedback of knowledge and knowledge.

In this perspective, the reading education with a view to the sustainability of human relations with the ecosystem instigates the "first and universal teaching, centered on the human condition. [...] To know the human being is, first of all, to situate him in the universe, and not to separate him from it" (MORIN, 2011, p. 43), going beyond contents and schedules. They are means, not the ends for the learner to feel (re)builder of the educational process, so as he learns he also bequeaths his learning to his peers.

However, it is quite opportune to highlight with the language in and of the arts. Languages of all languages. As Morin (2005) discusses, art fuels the peculiar innovation of science. And from the unfolding of understanding and intellection with life, emerges the creativity to innovate and expand the possibilities in the arts, sciences and other fields of expression of life by school (MORIN, 2005). Reconciling the arts and science in school is an invitation to curiosity. For Morin (2014, p. 22),

Education should foster the mind's natural aptitude for posing and solving problems, and correspondingly stimulate the full employment of general intelligence. [...] This full requires the free exercise of the most common and most active faculty in childhood and adolescence, curiosity.

The curiosity that permeates art, the unexpected, the unattainable can gain prominence in the acceptance and seduction of students by teaching. They like to be challenged and to point out what they know how to do most differently in groups of friends.

In this sense, the educator is invited to a form of understanding of his role as promoter and also disseminator of the desire to (re) create and innovate with practices that meet the desire and challenge of students in the final years of Elementary Education to learn. To do so, there is an imperative to take care of your doing in order to awaken this sense for the student. And so, it is an illustration of one of the cousins, therefore, of complex and transdisciplinary thinking: learning to be in order to make the environment be the space in which species in their diversity feed back in a healthy way.

This is what Morin (2011) discusses as interplanetary ethics. Take care of the other, of the environment to have the return in oneself and in the next. Thus, the ethics of the human is associated with interplanetary ethics. The commitment one has with one's own formation, with one's own being/being and, in turn, one has reflections in the other and in space/time; in the environment in which history itself is constructed, the uniduality of being. The other will represent what we offer him as a legacy today. Future generations will bring with them marks of the historical circuit that we bequeath to her by the knowledge and experiences they have inherited from us.

The involvement of the student with basic education emerges from the search for a future in which the older ones are also cared for by the younger ones, and on the contrary, as well. The meaning



of care from the affective aspect to the social and professional aspect is considered here. For those who are educated today will care as much for the elders as for the other young people of a later generation. The opposite can also occur.

This concept implies that the human being is constituted by characteristics that distinguish him from others. However, its existence does not end in itself. It is interdependent on what the other brings to aggregate and complete what it lacks. What one does, lives and learns is a (a) temporal construct. This is the case, thanks to the existence of the self in the other. Human existence depends on encounter, sharing, the recognition of the actions of the other in the actions of oneself and vice versa. The reverse also extends in cycle.

It is part of the process of reading the world. And it shows itself to be a human need, a way to deal with the differences inherent in human nature, recognizing the role they have in the construction of the human person himself. It is an exercise, learning tolerance. It depends, therefore, on the internalization of tolerance since "true tolerance is not indifferent to ideas or to generalized skepticism. It presupposes conviction, faith, ethical choice and, at the same time, acceptance of the expression of ideas, convictions, choices contrary to our own [...]" (MORIN, 2011, p. 88).

In this sense, complex thinking proposes to build knowledge integrating the extensions of life, breaking with the addiction of blindness that prevents variability (MORIN, 2005), validating the very contributions of science, including its principle of fallibility. It is to form and form oneself without letting oneself be manipulated by common sense, but to take it as a starting point to build and reconstruct new perspectives of the future either for common sense or for science in its extensions, as well as to discern the dialogical and dialectical relationship between both.

The mother tongue teacher in his specialty has here an important educational invitation: to open doors to welcome and dialogue with the other disciplines, so that together they may be strengthened to care for and transform realities. Those of the students and their own lives as educated citizens. A mission whose role starts from the ontological for the holistic formation of the human being.

This mission requires a dialogical and ethical look of the educator in a dynamic reflection on the school community and society as a mirror of it, finding the conception of "ecologized identity, individual or collective (...) which is always in the process of construction, in the process of becoming something dynamic, subject to the unpredictable and the unexpected" (MORAES, 2008, p. 205). From here we can see the greened thought woven under the spectrum of an integrative consciousness of the relations of interdependence - individual - society - nature (MORAES; NAVAS, 2015; MORIN, 2011).

The authors point out ways to the emancipation of human transcendentality and its potential convergences in the ethics of caring for the environment and the species that inhabit it. And so, care, love, preservation, dialogue to understand being and living together involve a chain of elements identified in synthesis by the legacies brought by reading education, in such a way that the teacher



reveals himself as responsible for himself and for the revelation of himself: in his formation and in the collective formation of his peers, with a view to the well-being of the community and the environment. These confluences flow respectively into the concepts of self, straight and ecoformation (MORAES, 2008.).

### 3 FINAL CONSIDERATIONS

For education to go beyond disciplinary fragmentation and repetition of techniques, complexity and transdisciplinarity invite the teaching and learning of reading to be thought of in order to integrate the plurality of cultures and knowledge constitutive of the school community. Therefore, as highlighted in the course of the discussions, an education is urgently needed to form creative, competent readers of their own stories, an education, therefore, of recreation, of historical-cultural expression of the learners. Certainly, the educator is invited to sensitivity, to creativity in the face of the diversity of challenging contexts to which he will be called to intervene.

The ecology of knowledge is shown here a path through which the reading education needs to pass, creating for the learner space to express the knowledge acquired in its history, and from it seeking and reconstructing other knowledge. With this, the student can recognize himself by his history as a being responsible for his own culture and find cultures that dialogue with his and guide him to understand himself better by the reading opportunities that the school has offered him.

From the encounters of complex thinking and transdisciplinarity with the process of reading, one awakens to the teaching of reading from the arts. In the light of Morin, the arts prove to be a diverse and strategic banquet to read, to feel the vicissitudes of the vital complex. The dialogue and the walk through multiple them are inexhaustible and insatiable, creating several opportunities for knowledge of languages and reading comprehension in a pleasant, engaging and inclusive way.

An invitation is made to the intellectual richness of interpretations, understandings and appreciation of differences and their abundance for the greatness that is human knowledge in the arts for reading. The resources of universalization of language, present in art and literature approach the possibility of associations of reading memories, strengthening conditions for students to understand critically and sensitively what they read. And so they feel committed to the ethical and aesthetic sense, creating the so-called ecosystem consciousness.

The revelation of new cultures and ways of seeing and representing a reality through the dialogue of diversity and respect among their peers of teachers can stimulate the student to understand and captivate the respect for diversity, believing in a coexistence of interplanetary care by sensitizing readers. Thus, it is possible to intervene and mitigate the situations of mismatches of knowledge that until then have been limiting and interrupting the advances of learning for a citizen ecosystem formation.



## REFERENCES

BRASIL. Base Nacional Comum Curricular. Proposta preliminar. Segunda versão revista. Brasília: MEC, 2018. Disponível em: < <http://basenacionalcomum.mec.gov.br/wp-content/uploads/2018/02/bncc-20dez-site.pdf>>. Acesso em: 12 jan. 2019.

BRASIL Estados. Diretoria de Avaliação da Educação Básica (DAEB), 2018b.

Disponível em: < [http://portal.inep.gov.br/informacao-da-publicacao/-/asset\\_publisher/6JYIsGMAMkW1/document/id/1510096](http://portal.inep.gov.br/informacao-da-publicacao/-/asset_publisher/6JYIsGMAMkW1/document/id/1510096)> Acesso em 29 de fev. de 2019.

BRASIL. Brasil no Pisa 2015: análises e reflexões sobre o desempenho dos estudantes brasileiros / OCDE - Organização para a Cooperação e Desenvolvimento Econômico. São Paulo: Fundação Santillana, 2016. Disponível em: <[http://download.inep.gov.br/acoes\\_internacionais/pisa/resultados/2015/pisa2015\\_completo\\_final\\_baixa.pdf](http://download.inep.gov.br/acoes_internacionais/pisa/resultados/2015/pisa2015_completo_final_baixa.pdf)>. Acesso em: 10 out. 2017.

BRASIL. INEP - Instituto Nacional de Estudos e Pesquisas Educacionais Anísio Teixeira. Inep divulga dados inéditos sobre fluxo escolar na educação básica. 2017. Disponível em: <[http://portal.inep.gov.br/artigo/-/asset\\_publisher/B4AQV9zFY7Bv/content/inep-divulga-dados-ineditos-sobre-fluxo-escolar-na-educacao-basica/21206](http://portal.inep.gov.br/artigo/-/asset_publisher/B4AQV9zFY7Bv/content/inep-divulga-dados-ineditos-sobre-fluxo-escolar-na-educacao-basica/21206)>. Acesso em: 25 fev. 2018.

COLOMER, T. Andar entre livros: a leitura literária na escola. São Paulo: Global, 2007.

COLOMER, T.; CAMPS, A. (Orgs.). Ensinar a ler, ensinar a compreender. Trad. Fátima Murad. Porto Alegre: Artmed, 2002.

CYRULNIK, B.; MORIN, E. Diálogo sobre a natureza humana. Trad. Edgar de Assis Carvalho. São Paulo: Palas Athena, 2012.

GIL, A. C. Como elaborar projetos de pesquisa. 6. ed. São Paulo: Atlas, 2017.

KATO, M. A. O aprendizado da leitura. 6. ed. São Paulo: Martins Fontes, 2007.

KLEIMAN, A. Texto e leitor: Aspectos cognitivos da leitura. 7. ed. Campinas, São Paulo: Pontes, 2000.

KLEIMAN. Oficina de leitura: Teoria e prática. 10. ed. Campinas, São Paulo: Pontes, 2004a.

KLEIMAN. Leitura: Ensino e Pesquisa. Campinas, SP: Pontes, 2. ed. 2. reimp., 2004b.

KOCH, I. G. V. Desvendando os segredos do texto. 5. ed. São Paulo: Cortez, 2006.

KOCH, I. G. V. O texto e a construção de sentidos. 9. ed. São Paulo: Contexto, 2007.

KOCH, I. G. V; ELIAS, V. M. Ler e compreender os sentidos do texto. 2. ed. São Paulo: Contexto, 2006.

LIPMAN, M. A filosofia vai à escola. São Paulo: Summus, 1990.



MORAES, M. C. Ecologia dos saberes: Complexidade, transdisciplinaridade e educação: novos fundamentos para iluminar novas práticas educacionais. São Paulo: Anatararana/ WHH- Willis Harman House, 2008.

MORAES, M. C; NAVAS, J. M. B. Transdisciplinaridade, criatividade e educação. Fundamentos ontológicos e epistemológicos. Campinas, SP: Papirus, 2015.

MORAES, M. C; NAVAS, J. M. B; MENDES, P. C. (Orgs.). Ética, docência transdisciplinar e Histórias de Vida: Relatos e reflexões em valores éticos. Brasília: Liber Livros, 2014.

MORIN, E. A noção de sujeito. *In*. Novos paradigmas, cultura e subjetividade. Orgs. Dora Fried Schnitman; Trad. Jussara Haubert Rodrigues. Porto Alegre: Artes Médicas, 1996.

MORIN, E. Ciência com consciência. Trad. D. Alexandre e Maria Alice Sampaio Dória. 8. ed. Rio de Janeiro: Bertrand Brasil, 2005.

MORIN, E. Os sete saberes necessários à educação do futuro. Trad. Catarina Eleonora F. da Silva e Jeanne Sawaya. 2. ed. São Paulo: Cortez; Brasília, DF: Unesco, 2011

MORIN, E. A cabeça bem feita: repensar a reforma, reformar o pensamento. Trad. Eloá Jacobina. 8. ed. Rio de Janeiro: Bertrand Brasil, 2014.

MORIN, E. Introdução ao Pensamento Complexo. Trad. Eliane Lisboa. 5. ed. Porto Alegre: Sulina, 2015.

MORIN, E; DÍAZ, C. J. D. Reinventar a educação: abrir caminhos para a metamorfose da humanidade. Trad. Irene Reis dos Santos. São Paulo: Palas Athena, 2016.

NICOLESCU, B. O Manifesto da Transdisciplinaridade. São Paulo: Triom, 1999.

SOLÉ, I. Estratégias de Leitura. Trad. Cláudia Shilling. 6. ed. Porto Alegre: Artmed, 1998.