THE SOCIAL MIND CLASSROOM IN TRANSCOMPLEX DECOLONIAL MATH EDUCATION[1]

A SALA DE AULA COMO MENTE SOCIAL NA EDUCAÇÃO TRANSCOMPLEXA E DECOLONIAL DE MATEMÁTICA

EL AULA MENTE SOCIAL EN LA EDUCACIÓN MATEMÁTICA DECOLONIAL TRANSCOMPLEJA

Milagros Elena RODRÍGUEZ
University of Oriente, Venezuela
E-mail: melenamate@hotmail.com

How to refer to this article

RODRÍGUEZ, M. E. The social mind classroom in transcomplex decolonial math education **Revista Hipótese**, Bauru, v. 8, e022001, Jan./Dec. 2022. e-ISSN: 2446-7154. DOI: https://doi.org/10.47519/eiaerh.v8.2022.ID8

Submitted: 19/03/2021
Revisions required: 20/03/2021
Approved: 21/04/2021
Published: 01/01/2022

[1] It belongs to the line of research entitled: Transcomplex Decolonial Mathematics Education.

BY-NC-SA

ABSTRACT: From a critical transdisciplinary transmethodology, the social mind classroom is analyzed in Transcomplex Decolonial Mathematical Education. As conclusions of openings, the social mind classroom in mathematics collaborates by demystifying elitist mathematics. Considerations of the human being, which means to educate is key in the re-linking of teaching to become the social mind classroom, an educational emerging of application in varied contexts. New plateaus are re-linked, rhizomes in teachers, in which learning is no longer the ultimate end of the process without a re-linked intermediate point, at all times students learn, unlearn and re-learn.

KEYWORDS: Classroom social mind. Mathematics education. Decolonial. Transcomplex. Reli-linked.

RESUMO: *A partir de uma transmetodologia transdisciplinar crítica, a sala de aula da mente social é analisada na Educação Transcomplexa Decolonial da Matemática. Como conclusões de aberturas, a sala de aula da mente social em matemática colabora desmistificando a matemática elitista. Considerações do ser humano, o que significa que educar é fundamental na religação do ensino para se tornar a sala de aula da mente social, uma emergência educacional de aplicação em diversos contextos. Novos platôs são religados, bem como os rizomas nos professores, nos quais a aprendizagem não é mais a meta final do processo sem um ponto intermediário religado, em todos os momentos os alunos aprendem, desaprendem e reaprendem.*

PALAVRAS-CHAVE: *Mente social de sala de aula. Educação matemática. Decolonial. Transcomplexa. Religada.*

RESUMEN: *Desde una transmetodología transdisciplinar crítica se analiza el aula mente social en la Educación Matemática Decolonial Transcompleja. Como conclusiones de aperturas, el aula mente social en la matemática colabora desmitificando la matemática elitista. Las consideraciones del ser humano, que significa educar es clave en el re-ligaje de la enseñanza para devenir el aula mente social, un emergente educativo de aplicación en variados contextos. Se re-ligan nuevas mesetas, rizomas en los docentes, en la que el aprendizaje ya no es el fin último del proceso sin un punto intermedio re-ligado, a todo instante los estudiantes aprenden, des-aprendeny re-aprenden.*

PALABRAS CLAVE: *Aula mente social. Educación Matemática. Decolonial. Transcompleja. Reli-gada.*

e-ISSN: 2446-7154
BY-NC-SA

Initial rhizome. Modernist mathematics education, traditionalist and classified as an exercise of authoritarianism in the classroom

The classroom of the social mind is born from the need to find ways out of the crisis of modernity-postmodernity-coloniality imposed as coloniality in the classrooms, in education. This, as a preventable project in the world, with the invasion of the South in 1492, its dominion and preeminence was discarding other knowledge and devaluing the South with its culture, its inhabitants; bringing consequences to the blindness of the Western human being who suffers "two cognitive deficiencies that blind him: the blindness of separate and compartmentalized knowledge [...] Western-centrism, which places us on the throne of rationality and gives us the illusion of possessing the universal" (MORÍN; DELGADO, 2016, p. 13)

This blindness was studied; the West's evasion and globalization terrify the world; while in the hands of some lies, wealth; many dies of hunger or scarcity of the most basic rights to life, such as water; "if modernity is defined as unconditional faith in progress, in technology, in science, in economic development, then this modernity is dead" (MORÍN, 1999, p. 34).

Likewise, "we understand modernity not as an intra-European phenomenon, but of a global dimension, linked to hegemony, periferization and geopolitical, racial, cultural and epistemic subalternation that modernity has established [...] Coloniality is the hidden side of modernity" (WALSH, 2007, p. 104). Therefore, modernity-postmodernity is understood in this research as an evasion project. This began with colonization and is perpetuated to this day with coloniality.

This present coloniality is the visible face that modernity shows and that refuses to die. The crisis permeates the South, and its invasion of minds, the coloniality of knowledge, power and doing permeates education especially; to the student is dictated to an instruction, foreign to their lives, cultures; the reductionism imposed in the classroom, not to mention the literacy that for years permeated many places. He was promoted in the classroom "divided, compartmentalized, mechanistic, disjunctive, reductionist, disruptive the complex of the world in separate fragments, fraction of the problems, separates what is united, unidimensionalizes the multidimensional. It is a myopic intelligence" (MORÍN, 1999, p. 18). In the South, under the imposed name America, the continent demystified; neither the "governments of the left nor the right were able to overcome the impediments of education; it is necessary to exercise alternatives that lead to the overcoming of coloniality and post coloniality through a subject" (ALVARADO, 2015, p. 108). As long as not decolonizing the doing and being in the human being, decolonizing knowledge, reinventing power (SANTOS, 2010); it will be difficult to

(cc) BY-NC-SA

transcend for liberating outputs that reach the majority. Thus, "decolonial thinking includes not only a critique of the coloniality of power and knowledge, but also collects the ideology of the Latin American critical thought tradition to promote emancipatory projects that transcend Eurocentric epistemic hegemony" (MÉNDEZ Y MORÁN, 2014, p. 51).

Therefore, decolonial thinking is urgent as a milestone for the realization of new paradigms that understand that its realization is only possible outside of modernity-postmodernity-coloniality. The crisis of modernist education is still present, "academia has served the purposes of globalization, because it promotes the condition of colonized colonizers, giving way to a neocolonialism in our day" (ALVARADO, 2015, p. 107). There is resistance to these realities; liberation projects that Paulo Freire, Enrique Dussel, Boaventura Do Santos; among many others that reflects this research on decolonial and liberation resistance.

In particular, one of the crises of modernist Mathematics Education is that education is only conceived in the classroom, instructing discipline and its theories; when mathematics contained in their cultural and daily knowledge, in nature, in the life processes of the actors of the educational process are distorted; in addition, they are considered underground, not knowledge; as issued by the modernist way of teaching; "the classroom is still seen as an enclosed space, as a "recent" even when one thinks of the concept of "school" or outside school, it is still thought that nature should be discovered and that everything is determined" (GONZÁLEZ, 2017, p. 12).

In this classroom mechanism, illusions and life projects are demolished, an attempt is made to inject mathematical algorithms as they are constructed; the dialogical processes of the human being, their affectivity; how they learn; the brain considers its intelligence alone in memory when remembering and issuing an assessment. Didactic processes so frequently studied in numbers result from didactics and pedagogy of mathematics as the transdisciplinary consideration of science; along with the complexity of what it means to educate, it continues to be left out of the classroom.

Thus, comfort, prescription, laziness and the imposition of an exercise of authoritarianism as they have formed us gain; these, far from being harmonious, makes going to the classroom become a torture when it comes to teaching; in which the teacher remains as the subject who teaches and the student is the object, who watches and must repeat. In addition to colonial educational policy; where its preeminence is not liberating education; there are underpaid and unmotivated teachers; in a structural crisis of educational institutions. The classroom then stands as a mechanism of oppression. Thus, we promoted, for example, the Freirean release of the theme in Decolonial Transcomplex Mathematics Education

BY-NC-SA

(RODRÍGUEZ, 2021).

This is how, in the process of oppression, we see that "this classic deterministic classroom puts us a straitjacket to think about complex and transdisciplinary education because it limits us to a single reality, a reductionist, pre-armed reality or one that many teachers repeat" (GONZÁLEZ, 2017, p. 12). That is why, in the teaching of mathematics at the first educational levels, the traditional classroom is a reason for rejection, because mathematics is imposed as foreign to their lives.

However, what happens when the crisis of mathematics teaching is added to the alienation of the process; that is, a process with Western realities in the South; independently, imbued with its culture, its realities; therefore, decoloniality as a project that goes in opposition to postmodernity-coloniality; prevails in study; not as war is returning to the West or to the North; No, the search for a decolonial education is "the need to think about education from another perspective, which examines alternative experiences and knowledge, promoting critical and emancipatory thinking" (ALVARADO, 2015, p. 103).

The training of professors in universities is colonial; they are used as a propagation of the exercise of power that the university transcribes in this model, both in the type of disciplinary thinking it incorporates, "and in the arboreal organization of its structures; the university is inscribed in what I would like to call the triangular structure of coloniality: the coloniality of being, the coloniality of power and the coloniality of knowledge" (CASTRO, 2007, p. 80).

The thought of the decolonial South, not being exclusive; it is deeply inclusive, respectful of the ways in which peoples make and develop, of their history and sovereignty; it's planetary. Consider the fact that the human condition was ignored from the modernist project and it's still imposed coloniality of human remains "cruelly divided, fragmented into pieces of a puzzle that lost its figure [...] it is impossible to conceive the complex unity of the human being through the disjunctive thought that conceives our humanity in an insular way outside the cosmos" (MORÍN, 1999, p. 21).

Colonial Modernist Mathematics Education was overcome as a system, mistakenly treated as closed, that has gone into crisis and must undergo a metamorphosis, which "is based on the fact that when a system cannot solve its vital problems, it degrades, disintegrates or proves capable of generating a meta system that knows how to treat its problems: metamorphoses" (MORÍN; DELGADO, 2016, p. 16).

Mathematics, and its teaching complexity, is conceived as a "profound reform of

e-ISSN: 2446-7154
(cc) BY-NC-SA

thought, an epistemological choice that is, in itself, endorsed with objective and educational methods. It is, then, our look at the world and on the things that should be questioned" (MORÍN, 2004, p. 463); this reform attacks state policies, curricula, didactics, pedagogy, teacher training; but also the complexity of mathematical conceptions separated from its history and philosophy, from everyday life and culture; complex thought attacks the separability of scientific knowledge and the underground of mathematics and recalls another way of doing mathematics, not only in the physical classroom, but also in the life and feeling of the student.

It is urgent, then, to discover how the human being learns mathematics, in the decolonial study of the crisis of mathematics, the convergence of minds and hearts is expressed giving rise to a greater and more complex unity. *The Noosphere, of the Greek noos (νόος), intelligence and sphere (σφαρα),* is the set of living beings endowed with intelligence. Since the beginning of humanity with the human being, the noosphere was born: a sphere of the things of the spirit, so we live in the midst of a jungle of myths that enrich cultures. Myths have taken the form of ghosts formed by our dreams and our imagination. Ideas took shape from the symbols and thoughts of our intelligences.

The term noosphere was coined by Chardin (1965) in the work: The Human Phenomenon; the original work in French was published in 1955. Edgar Morín takes this concept back to refer to the sphere of things "of the spirit produced by the human mind within a culture; and also proposes the constitution of noology, a science oriented to the study of self-organization of systems of ideas" (MORÍN, 1991, p. 111).

The noosphere is populated with beings materially rooted, but of a spiritual nature; information continues to have a physical-energetic support and at the same time, it is permeated to immaterial, in the same way the myth, the god and the idea have physical-energetic support in human brains and are realized from the "materiality of the chemical-electrical exchanges of the brain, the sounds of the word, records. They have, above all, a biological support consisting of these same brains, and this is what will give life of their own" (MORÍN, 1991, p. 118).

Under transparadigmatic investigations, transcomplexity is understood as a view of the world or an episteme, which emerges to give multiple possibilities to remake and resignify reality, "from it the adoption of an open, flexible, unfinished, integral, systemic and multivariate position, in which the quantitative, qualitative and dialectical complement to each other in a synergistic relationship configures multidimensional epistemic matrix" (SCHAVINO, 2012, p. 27).

Under this open decolonial view, "transcomplexity does not involve multidisciplines, but respect for the plurality of knowledge" (SOTOLONGO, 2011, p. 43). Transcomplexity is

BY-NC-SA

used to be able to resignify in openings of Mathematics Education to the social mind in the classroom that is born in transcomplexity, in complexity, "the social mind in the classroom took strength from the concept of ecological mind and the fundamentals of cognitive theories" (GONZÁLEZ, 2017, p. 169). Therefore, as a category, transcomplexity is mandatory in the consideration of the study of the classroom of the social mind.

In the mathematics classroom, we speak of "a social-classroom mind that each discipline has and allows the ability to learn and unlearn, and generate knowledge at all times of life" (GONZÁLEZ, 2007, p. 56). It is full of complex experiences, there is no separability in the social mind of the classroom for each discipline; the student in this intersubjective space is deeply transdisciplinary and must be rushed to this dialogue of knowledge; leave it at the door of consideration of the plateaus that dialogue with knowledge that prohibited to consider in the teaching of mathematics.

The classroom of the social mind is separated from the teaching time of the traditional classroom, its structure "is immersed in an infinite time and space, in three fundamental pillars: emergency, the involvement and the uncertainty. Its application in education is very broad, especially in processes of curricular development and scientific research" (GONZÁLEZ, 2012). Therefore, the student opens up with his games, with his culture, with his daily life that is not marked by time, nor hastened to in his demystification of tasks in the classroom; thus, the student opens to learn mathematics by reviving it in the classroom, poetically, in the form of affective realities; thus, decreasing the rejection of science.

From the social mind in the classroom, the human being can think conveniently, the "global/local/global dynamics requires concepts capable of comprehensively globalizing the one-dimensional view of the globalization process through its connection with the history of the human being and its current scale in relation to the future of the Earth" (MORÍN; KERN, 1993, p. 191)

Now, if this adds to the discourse of Mathematics Education as an object of domination, research assumes an exciting evolution, which in the line of research: *Decolonial Transcomplex Mathematics* Education begins to deregulate the obscurantism that has still forbidden, even, transparadigms as transcomplection, of which many researchers intend full achievements in modernist-postmodernist misdemeanors.

The consideration that exists in each human being, "a complex intersubjective space where uncertainty and cognitive sensitivity interact for the subject to learn" (GONZÁLEZ, 2017, p. 7) gives exit preeminence in this Transcomplex Decolonial Mathematical Education.

(cc) BY-NC-SA

The global crisis of mathematical teaching. For this, accepting that this space exists is accepting and becoming the human condition of the actors of the educational process of mathematics and its communication must, in a transdisciplinary way, be collaborative in understanding how to teach and how the human being learns; "transcending into a planetary view of life, […], systemic taking into account the reason for being" (GONZÁLEZ, 2017, p. 7).

They have already begun to enter the starting lines; because this research is developed in a non-linear way, in the form of levels in which the old methodological regime: introduction-development-recommendations-conclusions is left behind in a transcomplete transparadigm that we need in the future.

In what continues, we discern about the transmethodology, the objective and the project in which the survey is framed and then the ecology of knowledge and in Decolonial Transcomplex Mathematics Education; and ends with some final reflections that are quite open to the rhizomatic continuation of the line of research.

Rhizome: Transcomplexity and Critical Transdisciplinarity, transparadigm and transmethod

First, the use of rhizomes in the survey is not a coincidence, it is the deep transdisciplinarity that assigns to it intertwined conceptions and the conformation of plateaus in the discourse; the denomination of rhizome in the structure of the investigation, "is a deep trans genealogy that breaks with the static structures of division to present the results of the research in which the parts are unbreakable divided into a one-way" (RODRÍGUEZ, 2019c, p. 4). It is a question of breaking with the disjunction of investigations that begin with the introduction and end with conclusion; here the complex denote of the rhizome indicates a back and going that is conjugated throughout the survey where, from the root, you go to the branches and these do not exist without a stem at the same time, all communicate.

Secondly, transcomplexity, with the link complexity and transdisciplinarity, is in this category of research constitutive of the object of study and is an attic transparadigm; it encourages to go beyond the modern paradigm, it is sought with disciplines in their conjugation to go to an ecology of knowledge, "to guide the teaching of mathematics from the paradigm of complexity produces an ethical perspective that gives a dimension of ideological initiative to students, and the challenge of understanding the complex phenomena of the systemic world" (RODRÍGUEZ, 2010, p. 58).

From critical transdisciplinary research, the social mind classroom is analyzed from

BY-NC-SA

transcomplex Decolonial Mathematics Education, which is the objective of the research (RODRÍGUEZ, 2020a). In the transdisciplinary approach, it is necessary to recognize that there are several perspectives on transdisciplinarity, a term coined by Piaget (1979) and referred to in several works in Morín's work (1974, 1981, 1997). This survey allows us to go through concepts of any science, without disciplining it to reductionist conceptions; this is how we indiscipline the disciplinary concept of the classical classroom.

The survey needs to go complexly outside the reductionist stages of modernist mathematics teaching, where the classroom as a teaching-learning space is the protagonist and go to "transdisciplinary research deals with phenomena that manifest, occur and interest science from a perspective that transcends the different disciplinary horizons" (MOLINA Y VEDIA, 2016, p. 3); for the classroom of the social mind is preeminent transcending boundaries.

We must be clear in specifying that this does not mean that we exercise discipline (RODRÍGUEZ, 2020b); no, without it there is no transdiscipline, "it is not that we can dispense with specialization altogether, because it would be impossible if we wanted progress to continue, but the idea that this is a virtue, but a preventable evil, is gaining ground" (SCHRÖDINGER, 1985, p. 17). Thus, transdisciplinarity has serious advances for the practical exercise of complexity.

Scientific mathematical knowledge is very special in its consistency and characteristic that, without including or distorting it from its essence, in inclusion, must be achieved a mathematical knowledge embraced with the underground knowledge of science that calls for "the breaking of the limits of disciplines, articulates its activity crossing a wide multiplicity of disciplines, fields and discourses, extracting the best from each of them, without being captured and imprisoned in them" (OCAMPO, 2018, p. 32).

It is noteworthy that, in this research, "the transdisciplinary proposes an always dialogical attitude, recognizing the complexity that can be found at all levels of analysis" (OLANO, 2019, p. 12). Thus, the understanding of the classroom of the social mind in transcomplex Decolonial Mathematics Education is accepted; logical intelligence with spiritual intelligence; it is admitted that what is not regularized is part of how the individual learns; subjectively imbricated in the mind, anchored in the spirit where it is not possible to divide the social mind of the classroom for each discipline that the human being studies; thus, from transdisciplinary research, the social mind in the classroom contributes to complicate all his knowledge for the full understanding of mathematics.

(cc) BY-NC-SA

Rhizome: The classroom or the social mind of the classroom?

What begins we ask ourselves if the concept of *noosphere* has evolved to achieve the concept of social mind in Juan González Velasco's classroom? The noosphere has not changed its conception in time, in its perception of the sphere of thought. In Social Psychology, concepts related to the classroom of the social mind are studied "implying the concepts of "social mind" and "social consciousness" — it is that a single process can occur through various "centers of experience"" (ELLWOOD, 1899, p. 7).

Now, thinking of the noosphere, as a sphere of thought, multiple, elevated in maximum expression and that must be constantly fed, leads us to consider the social mind of the classroom as a possibility to understand itself in this sphere, not as a substitute, but as a fertilizer that leads us to understand the conformation of knowledge from the transdisciplinary and transversalized movements of life itself.

The classroom of the social mind, from its decolonial planetary sense, is at the same moment of trying to rescue the human being, in resignifying him as a subject with sensitivities, feelings, valuable values and knowledge, human beings intertwined in metacomplex processes capable of rescuing buried knowledge with scientists from transversal, complex and transcomplex perspectives from an anthropoethical feeling, diatopic and ecosophic where the being and learning it develops are considered under a vision of planetary, holocratic life, and when considering this, González (2017) takes us from the social mind in the classroom to this possibility of teaching thought to open us on the planet.

In traditional teaching, it is mandatory to relate what happens in the classroom, that classroom; where the student must learn after teaching, led by a teacher who incorporates theories and imposes them on the student. *The classroom ceases to be the classroom and becomes a subjective mental space; non-physical space where everyone learns; where their life stories, cultures, daily life, among others come* from. This is how we have expressed the social mind of the classroom (GONZÁLEZ, 2017).

In the possibility of not falling into the pitfalls of modernity, of signifying them; new paradigms are expressed; what I call transparadigms, among them refers to *the new science* is not "a science that performs the suppression of disciplines, it is a possibility of reconnection and fertilization, because a discipline outside its environment cannot be useful to anyone, not citizens, nor to human beings" (MORÍN, 2006, p. 39).

What he says is how to make education breaks with traditionality, thus addressing the "need to produce, between these dialogues, bonds and articulations without which it is not

BY-NC-SA

possible to access a clear understanding of its purposes and developments" (ESCOBAR; ESCOBAR, 2016, p. 90). This rupture with traditionality transcends the physical classroom as a learning space for the classroom of the social mind, which, without relying on space or time, is the imaginative, spiritual, subjective space of teaching and learning of the actors of the educational process. The shift to transcomplete transparadigm is logical because an essentially transmitted, verbalist and instructionist education is not constant with the "new approaches and budgets of novelty". Integration, interdependence and acceptance of dualisms and antagonisms are necessary elements to improve in the theme of education its enormous wealth of capacities, emotions and expressions" (ESCOBAR; ESCOBAR, 2016, p. 92).

The transcomplexity appears on the scene; expressed as such by Rodríguez (2019b); the *script returns to the new binding as a possibility often repeated in the incessant search for knowledge*. In the work, the seven knowledge of Edgar Morín's future education refer to a great reconnection of the consequences of knowledge of the natural sciences to locate the human condition in the universe, from those resulting "from the human sciences to clarify the multidimensionalities and human complexities and the need to integrate the invaluable contribution of the humanities, not only of philosophy and history, but also of literature, poetry, the arts" (MORÍN, 1999, p. 21).

This Morinian reconnection occurs in the social mind in the classroom that takes into account the complexity of the human being and the ecology of the action that is "to take into account its own complexity, that is, the risk, the chance, the initiative, the unexpected decision, the unforeseen, the awareness of deviations and transformations" (MORÍN, 1990, p. 11). This reconnection was present in the construction of deeply revised mathematical theories, reconstructed; for example, "the numbers are real, even if they do not exist as such in nature. His kind of reality, transcendent, almost Pythagorean according to one point of view, did not fail to torment the spirit of mathematicians" (MORÍN, 1991, p. 111).

Such excellences in complexity and metacomplexity are not only achieved in a physical classroom, but also the classroom "becomes a libertarian space where one and the other converge respectfully and in solidarity. These circumstances increase the identity of each one, assume the differences, but manage to create other possibilities of interpersonal and intersubjective dialogue" (ESCOBAR; ESCOBAR, 2016, p. 97).

It thus transcends the social mind of the classroom; that it is now desirable to take you to transcomplex Decolonial Mathematics Education. This social mind classroom "leads us to analyze the ability to learn, teach and generate knowledge of all those who participate in

(cc) BY-NC-SA

education" (GONZÁLEZ, 2009, p. 4); because it leads to the rethought of communion with the other, of its discernment and connection with citizenship that reconnects its thought in the ecological search to learn the difficult art of inhabiting the planet.

In this case, the first element of construction of the social mind in the classroom is part of the existence of an educational reality, which breaks "the scheme of the classroom as a physical space of learning, and that goes beyond modeling what must be learned and where any didactic or educational system and subsystem itself, complements a complex and transdisciplinary education" (GONZÁLEZ, 2017, p. 12).

It is there considered, then, the classroom as a physical space in the style of temples in Christianity, but that its true church is not the temple; however, people in Christian communion with the word and commands of God in the Bible. So, it is the social mind of the classroom.

For the math student; feeding and learning from the social mind in the classroom needs transdisciplinarity; this is the immersion towards scientific and traditional knowledge in correspondence with the relationship and convergent food of the sciences; so, learning is learning from knowledge in general with their culture and life. For this, to reflect is an emergency in the social mind in the classroom; urgent reconnections, such as complexity and its dialogical principle; in the complex and transdisciplinary social mind of the classroom.

For the full understanding of the social mind in the classroom, it should be recognized that "all knowledge operates through the selection of significant data and rejection of non-significant data: separates (distinguishes or disarticulates) and unites (associates, identifies); hierarchical (the main, the secondary) and centralizes (according to a core of master's views)" (MORÍN, 1990, p. 28).

In the classroom the social mind goes to a meta-thought that is the attitude that the thinking subject has towards the reality that pretends to manipulate, know, understand, explain, interpret and transform; it is the set of actions and reactions developed by the thinking subject in response to their interests, motivations, emotions and personal and social needs; it is the mental state of themselves and the other; it is the ability to perceive, reflect and understand the whole and the part in dynamism and under structured guidelines.

It is urgent, then, in decolonial education, to develop "the study of the brain, mental and cultural characteristics of human knowledge, of its processes and modalities, both of psychic and cultural dispositions that allow the risk of error or illusion" (MORÍN, 1999, p. 9). We must learn the way we know, how this classroom operates the social mind, there comes the human condition as we are enigmatic, spiritual, biological, social beings, we are good, but wicked; all these dichotomies should be accepted and addressed in the teaching-learning

BY-NC-SA

process. It is urgent with this, the study of the spirit; how it communicates with us, how this sphere of thought feeds and helps us learn.

In the following this rhizome is summarized with a graph.

Figure 1 – Drawing of a Chinese schoolgirl

Source: Conducted for research (2021)[2]

Rhizome: The Social Mind Classroom in Transcomplex Decolonial Mathematics Education

Transcomplex Mathematics Education is a resistance that involves from a dialogical context: "educating in reflexivity, amazement, resistance and the perception of social transformations, incorporating complex theory, invites to integrate the relationship between society and society, a trilogy from which educational blindness can be overcome and knowledge reorganized" (ANDRADE; LEGUIZAMO; VERGARA, 2018, p.495).

Rescuing and safeguarding transdisciplinary and transversally the mathematical knowledge of the South is urgent in people's lives; that's the decolonial meaning. Transcomplex Decolonial Mathematics Education seeks "the construction of a theme capable of overcoming educational limitations, taking responsibility for its choices and deciding to articulate itself to liberating and anti-hegemonic praxis" (ALVARADO, 2015, p. 109). This education is called for the mathematics teacher, the mathematician to whom we are called to profound changes,

[2] Legend: Classroom social mind; Transdisciplinarity - Transversality; reconnection, meta-thinking, complexity; Metacognition, Subjectivity; Dialogue-Community-Actors-Everyday.

BY-NC-SA

from the South to the world; deeply planetary; that goes on the path of the liberation of mathematics, therefore "it is necessary to go through the knowledge of one and the circumstances, accepting the other knowledge as an essential part of knowledge" (ALVARADO, 2015, p. 109).

In this sense, it is urgent that learning mathematics is not injecting into itself theories that make no sense, but we take them to the counter-formation of the citizen, planetary citizenship "humanized, anthropoethics, investigative, creative, innovative, critical, transformative and planetary. They are citizens who are becoming less anthropocentric and more ambiocentric, a form of dialogue between nature and the society that culture crosses as an integrating and mediating axis" (RODRÍGUEZ, 2019b, p. 140). In an ecology of knowledge, mathematics is called to participate in all this reconstruction and desired excellences of the human being.

The inclusion and profound transdisciplinarity of the classroom of the social mind in the Transcomplexes of Decolonial Mathematics Education, the classroom of the social mind "is not limiting, can be applied to any discipline, is self-taught, self-sufficient, inspired with strong value of cognitive sensitivity, rooted in what the connoisseur, researcher or creator wants to discover, create or rebuild" (GONZÁLEZ, 2018, p. 43). Applicability in mathematics is transcendental because mathematics that crosses all sciences and at the same time it goes as a transscience in the life of the human being and the development of countries regains meaning.

Thus, learning mathematics should be "weaving, braiding, mesh, assembly, articulation, binding, union from beginning to end" (MORÍN, 1998, p. 3); knowledge, which from, for example, teaching mathematics I can teach culture thinking about geometry, *for example, of heritage works, of the fabrics of the Wayuu: the Kanasu and, thus, connoting examples that transdisciplinarity allows to conceive.*

Educational ties must be created under various flattening of reality, from scientific knowledge to underground knowledge and vice versa, as well as within the establishment of feelings of various states that conform to a decolonized cultural identity, also discovering in their classroom the social mind (RODRÍGUEZ, 2019a, p. 10), it is that conscious and complex state of what the student is actually capable of creating, build, rebuild and contribute (GONZÁLEZ, 2012); mathematics is, par excellence, malleable to all this; called to recognize these knowledges that are revealed in the daily life and culture of the human being.

On the other hand, the classroom as a physical space should be consumed, it is essential to resignify the school, as well as the role of the pedagogue in all the spaces transversal to it. It is necessary and essential to repeatedly explore the organizational and pedagogical fabric that

BY-NC-SA

underpins the framework of educational institutions and promotes the process of school practices; which is "at the same time intellectual, axiological and praxiological, the essential is to discover other conditions so that, in the depths of human identity, the values that can contribute to the creation of a collective identity are restored" (ESCOBAR; ESCOBAR, 2016, p. 98).

In Transcomplex Decolonial Mathematics Education, liberation is paramount, and Education in the City, authentically Freirean, combines that physical space; the classroom in "the school is not just a physical space. It is a work climate, a posture a way of being" (FREIRE, 1997, p. 19). It is expected that, from school, to any educational institution, to the city and from this to school, the knowledge of mathematics will be rescued in the classroom of the social mind of the actors of the educational process that contribute to the ontological release of mathematics teaching.

Therefore, in the classroom of the social mind there is a liberating practice where citizens are active subjects of their teaching-learning process and their highly complex and excellent cultural praxis. "It should be noted that the classroom of the social mind is a complex experience with the city, but from which educational institutions that are nourished in a transdisciplinary way are nourished" (RODRÍGUEZ, 2019a, p. 16). With this, *the traditional physical classroom is unarmed and reconnected to a social mind classroom*. The physical and space, educational institutions transcend the popular habitat; to any place where mathematics is subjectively learned.

Education in the city combines mathematics teaching with "popular participation [...] education breaks with the tradition that only the elite is competent and knows the needs and interests of the whole society" (FREIRE, 1997, p. 19). From there, the idea of a city that educates from which emerges conceptual axes of the conformation of the student as a citizen who "inquires in the recognition of this knowledge, encompassing them in a single claim: the acceptance of alternative knowledge to Western hegemony" (ALVARADO, 2015, p. 110).

Likewise, "the classroom moved and understood in the objectivity, subjectivity and intersubjectivity of the complex, subject and spaces where hermeneutics makes and remakes the history of culture, life and coexistence of the citizen" (RODRÍGUEZ, 2019a, p. 16). This contributes to a social mind in the classroom of the actors of the educational process for a mathematics of the city, of the street; to a deconstructed pedestal that can give faith and hope to the student predisposed by the mathematics that he can learn; that his investigative value of his childhood and daily life in that classroom social mind collaborate so that mathematical

e-ISSN: 2446-7154
(cc) BY-NC-SA

concepts are shaped in learning.

Education in the city is deeply anthropological in Decolonial Transcomplex Mathematics Education, this new policy "constitutes an affirmation of hope in human subjectivity, since it is a question of drawing attention to situations apparently already known to, in the light of a new thought, understand them and humanize them from existential resignifications" (BUITRAGO, 2011, p. 17).

The social mind of the classroom in the mathematician, in the teacher in "that conscious and complex state of what the student is really capable of creating, building, building and contributing" (GONZÁLEZ, 2017, p. 41) takes him from the best of his human condition to re-establish the process of avoiding mathematics and assuming his anthropoethical responsibility to teach with soul, body and heart.

On the other hand, it is worth considering the fact that from this complex that is the framework of knowledge and learning of the greenish citizen with the dialogue of knowledge, the social mind in the classroom is not disciplinary; is transdisciplinary; this is not what the student has; under these premises, a social mind in the classroom for mathematics, another for language; and so on. No, it's more; nor the sphere of thought: the noosphere has been like this. It is not divisible; it is an imaginary, often enigmatic whole; for we know in a general way how to learn; but by accepting in education that the student connects with the innermost part of his being learns, then, that we can understand a little more the nature of the human being.

The social mind of the classroom in mathematics collaborates in the demystification of elitist mathematics before people, does not mean that its rigor ceases to exist, nor its axiomatics and conceptions. The considerations of the human being, of the human condition, of what it means to educate are fundamental in this relinking of mathematics teaching thinking about the social mind of learning in the classroom; it is an educational emerging application in various contexts of learning and teaching to the educational actor in differently, goes beyond the metacognition that breaks space, dimension and time as exhaustive elements in the structuring of ideas for the construction of mathematical knowledge. Its threshold lies in the basic conceptions of creativity and complex thinking that are applied in the educational field.

Detach themselves from old positions that ignore education in the social mind in the classroom as a contribution of complexity in its application in the teaching of mathematics as a relinked creative process. In fact, it turns out that the physical classroom is not the main creative engine of the human being, but the classroom as such is found in the subject in any space of learning and teaching that condescending the subject to not reproduce knowledge, but rather to reflect, create and innovate, to meet the real needs of the community, so that the

BY-NC-SA

classroom of the social mind is a very perceptive creative process in the human being, which arises in a way that connects and disarms their knowledge to read the world from complex scenarios.

Thus, in the teaching of mathematics, new levels are imagined, such as rhizomes in teachers, in which learning is no longer the final end of the process without a reconnected intermediate point, at all times students learn, learn and relearn, it is a rhizome that must be examined and outsourced in different steps of reality, also manifesting in your classroom the social mind that conscious and complex moment of what the student is truly able to create, build and contribute to their country, their environment, their community or their space.

The social mind of the classroom in learning mathematics; is in the mind of each actor of the educational process from their daily life, their culture, intersubjectivity, collaborative learning, the math student is in his social mind in the classroom, which leads to inclusion in the training of teachers of a social mind in the classroom that resignifies the traditional classroom; with this their training is enriched in a meaningful practice, rich in new inclusive forms and a reconnected assessment.

Just below, there is a chart that illustrates what was done in the current rhizome.

Figure 2 – Classroom as social mind

Source: Conducted for research (2021)[3]

[3] Legend: Planetary Decoloniality; Transdisciplinarity - Transversality; reconnection, research, education in the city, complexity, anthropoethics, metacognition, subjectivity; Classroom social mind- transcomplex decolonial mathematical education.

e-ISSN: 2446-7154
DOI: https://doi.org/10.47519/eiaerh.v8.2022.ID8
BY-NC-SA

Rhizome: Conclusions of decolonial and transcomplex initiations

In the present research of critical transdisciplinary transmethodology, the social mind classroom was analyzed from transcomplex Decolonial Mathematics Education, which is the complex objective of the research. The incitement to think of the social mind of the classroom is done in a rhizomatic way, because there is no single direction in the construction of the survey. From the analysis, the social mind in the classroom indicates that the formation of the mathematics teacher should be rethought in his praxis and at the university in our planetary era, rethinking it from a vision that recognizes the knowledge of others. This fact is the essence of decoloniality that is deeply political with the mission of epistemic reformulation; further the unmasking of the coloniality of modernity in times of globalization; which is desirable in a planetization.

Therefore, the traditional classroom is not annulled in its significance; but that the intersubjective space has been opened at all times of teaching and learning of the actors of the educational process; "the search for other knowledge must be carried out, which brings humanity closer to understanding itself, both in its most commendable aspects, but at the same time from the most deplorable of itself" (ALVARADO, 2015, p. 113); this other knowledge of mathematics leads to the reformulation of educational policies, curricula, intentionality in the teaching of mathematics, conjunction and the complexity of mathematics with its history and philosophy, with the transdisciplinarity and transversality of the knowledge of mathematics, and with the literacy of mathematics as a possibility in all human beings.

However, the teaching of mathematics is also open to the classroom of the social mind because, from there, the ecology of knowledge is possible; that is the theme of continuation in study: Transcomplex Decolonial Mathematics Education. All this from critical transdisciplinary research as a transmethod. Transdisciplinary research is a task that seeks the discovery and restructuring of the knowledge of mathematics teaching, with the intervention of all components of the universe, with disciplines, but also with the ecology of everyday knowledge, lay, of popular habitat; involving the subjectivities of the individual who actively participates in the investigative process.

Therefore, in the end, in complex scenarios, the author says goodbye with feelings of mathematics in the citizen's life, in love and poetry that lead him to promote a liberating Mathematical Education, with mind, body and heart; in subsequent studies of that line of research; spiritual intelligence plays a preponderant role in the teaching and learning of mathematics; which deconstructs learning processes as well as only mental. Thus, the reality of

BY-NC-SA

the book entitled: the mathematics of love and friendship, in the poem entitled: the constant love of a mother.

> The constant function that extends from infinity to infinity never changes; as your mother loves: unchanging despite my abandonment at my distance, but my absences are immense and you continue to love me faithfully constantly. Mother's love of mother far from unjust sorrows that travel time her missing children in a life without you, appear in the finitude of her life and your mother still has it; the constant love of a mother (RODRÍGUEZ, 2018, p. 52, our translation).

Despite the wisdom of God, always uniting and enlightening us with his wisdom and deep love: United Bible Societies (1960) Philippians 2:2: "*Complete my joy, being of the same feeling, preserving the same love, united in spirit, dedicated to the same purpose*."

REFERENCES

ALVARADO, J. Pensar la educación en clave decolonial. **Revista de Filosofía**, Maracaibo, n. 81, p. 103-116, 2015.

ANDRADE, J.; LEGUIZAMO, D.; VERGARA, A. Educación para la resistencia, una aproximación desde la complejidad. **Revista Kalivando**, Bogotá, v. 10, n. 2, p. 495-508, 2018.

BUITRAGO, M. **Reconfiguraciones antropolíticas que favorecen la expansión de la condición humana en contemporaneidad**. 2011. Tesis de Grado (Maestría en Educación) – Universidad Católica de Manizales, Manizales, Colombia, 2011.

CASTRO-GÓMEZ, S. Decolonizar la universidad. La hybris del punto cero y el diálogo de saberes. *In*: **El giro decolonial**. Reflexiones para una diversidad epistémica más allá del capitalismo global. Bogotá: Pontificia Universidad Javeriana - Instituto Pensar; Universidad Central – IESCO; Siglo del Hombre, 2007. p. 79-91.

CHARDIN, T. **El fenómeno humano**. Taurus: Madrid, 1965.

ELLWOOD, C. Prolegomena to Social Psychology I: The Need of the Study of Social Psychology. **American Journal of Sociology**, New York, v. 4, n. 5, p. 656-665, 1899.

ESCOBAR, R.; ESCOBAR, M. La relación entre el pensamiento complejo, la educación y la pedagogía. **Administración y Desarrollo**, Bogotá, v. 46, n. 1, p. 88-99, 2016.

FREIRE, P. **La educación en la Ciudad**. México: Siglo XXI editores, 1997.

GONZÁLEZ, J. El dialogo como Herramienta de construcción cognitiva en el aula- mente-social. **Revista Ciencia y Comunidad**, Bolivia, v. 4, p. 53-58, 2007.

Rev. Hipótese, Bauru, v. 8, e022001, Jan./Dec. 2022.
DOI: https://doi.org/10.47519/eiaerh.v8.2022.ID8
e-ISSN: 2446-7154
(cc) BY-NC-SA

GONZÁLEZ, J. **El aula-mente-social como constructo didáctico complejo**. La Metacognición bajo el Enfoque de la Complejidad. 2009. Tesis de Grado (Doctorado en Educación) – Universidad de Manizales, Manizales, Colombia, 2009.

GONZÁLEZ, J. **Teoría Educativa Transcompleja**. Tomo I. Alemania: Editorial Académica Española, 2012.

GONZÁLEZ, J. **Aula mente social**. Pensamiento transcomplejo. Baranquilla: Universidad Autónoma del Caribe, 2017

GONZÁLEZ, J. **Pensamiento religado**. Ligar para religar. Baranquilla: Universidad Autónoma del Caribe, 2018.

MÉNDEZ, J.; MORÁN, L. Pensar más allá de la modernidad eurocéntrica en perspectiva decolonial. **Revista de Filosofía**, Maracaibo, v. 78, n. 3, p. 42-55, 2014.

MOLINA Y VEDIA, S. Metodología del proyecto transdisciplinario Las formas del cambio. *In*: ENCUENTRO LATINOAMERICANO DE METODOLOGÍA DE LAS CIENCIAS SOCIALES, 5., 2016, Mendoza. **Actas […]**. Mendoza, Argentina: Universidade Nacional de Cuyo, 2016.

MORÍN, E. **El Paradigma Perdido**. Ensayo de Bioantropología. Barcelona: Kairós, 1974.

MORÍN, E. **El método**. La naturaleza de la naturaleza. Madrid: Cátedra, 1981.

MORÍN, E. **Introducción al Pensamiento Complejo**. Paris: Ediciones ESF, 1990.

MORÍN, E. **El Método IV**. Las ideas. Madrid: Cátedra, 1991.

MORÍN, E. **Introducción al Pensamiento Complejo**. Barcelona: Gedisa, 1997

MORÍN, E. **Los siete saberes necesarios para la educación del futuro**. Barcelona: Paidós,1999.

MORÍN, E. La epistemología de la complejidad. **Gazeta de antropología**, México, v. 20, n. 10, p. 1-14, 2004.

MORÍN, E. **Modelo educativo**. Una Aproximación Axiológica de Transdisciplina y Pensamiento Complejo. Hermosillo: Multiversidad Mundo Real Edgar Morín, 2006.

MORÍN, E.; DELGADO, C. **Reinventar la educación**. Abrir caminos a la metamorfosis de la humanidad. Ciudad de México: Multiversidad Mundo, 2016.

MORÍN, E.; KERN, A. **Tierra Patria**. Buenos Aires: Nueva Visión, 1993.

OLANO, A. Comprensión epistemológica de la educación inclusiva: discusiones analítico-metodológicas. **Revista Espaço**, San Paulo, v. 50, p. 21-43, 2018.

OLANO, A. **Estudios internacionales latinoamericanos y pensamiento decolonial**. Contribuciones a un conocimiento situado. Bogotá: Universidad Externado de Colombia,

Rev. Hipótese, Bauru, v. 8, e022001, Jan./Dec. 2022. e-ISSN: 2446-7154
DOI: https://doi.org/10.47519/eiaerh.v8.2022.ID8
BY-NC-SA

2019.

PIAGET, J. **Lógica y conocimiento científico**. Buenos Aires: Proteo, 1979.

RODRÍGUEZ, M. E. La enseñanza de la matemática desde la perspectiva sistémica compleja. **Revista Visión Educativa IUNAES**, Durango, v. 4, n. 10, p. 51-61, 2010.

RODRÍGUEZ, M. E. La educación patrimonial transcompleja en el aula mente social y las instituciones educativas. **Revista Aletheia**, Bogotá, v. 11, n. 1, p. 146, 2017.

RODRÍGUEZ, M. E. **Las matemáticas del amor y la amistad**. Caracas: Editorial el Perro y la Rana, 2019a.

RODRÍGUEZ, M. E. Re-ligar como práctica emergente del pensamiento filosófico transmoderno. **ORINOCO Pensamiento y Praxis**, Ciudad Bolívar, v. 11, p. 13-3, 2019b.

RODRÍGUEZ, M. E. Deconstrucción: un transmétodo rizomático transcomplejo en la transmodernidad. **Sinergias educativas**, Ecuador, v. 4, n. 2, p.1-13, 2019c.

RODRÍGUEZ, M. E. La educación patrimonial transcompleja en el aula mente social y la ciudad. **Revista Digital de Gestión Cultural**, México, v. 14, p. 1-20, 2020a.

RODRÍGUEZ, M. E. La investigación transdisciplinar crítica: Un transmétodo rizomático en la transmodernidad. **Perspectivas Metodológicas**, Buenos Aires, v. 21, e3165, p. 1-9. 2020b.

RODRÍGUEZ, M. E. La liberación freiriana del sujeto en la Educación Matemática Decolonial Transcompleja. **Praxis Educativa**, Durango, v. 16, e2117161, p. 1-15, 2021.

SANTOS, B. **Decolonizar el saber, reinventar el poder**. Montevideo: Ediciones Trilce, 2010.

SCHAVINO, N. **El enfoque integrador transcomplejo y la investigación educativa**. Maracay: Ediciones UBA-REDIT-UNITEC, 2012.

SCHRÖDINGER, E. **Ciencia y Humanismo**. Barcelona: Tusquets, 1985.

SOCIEDADES BÍBLICAS UNIDAS. **Santa Biblia**. Versión Reina-Valera. Venezuela, 1960.

SOTOLONGO, P. **Complejidad y morfogénesis**: De las propiedades de los sistemas a la existencia misma de tales sistemas. La Habana: Instituto de Filosofía de La Habana, 2011.

WALSH, C. ¿Son posibles unas ciencias sociales/culturales otras? Reflexiones en torno a las epistemologías decoloniales. **Revista Nómadas**, Buenos Aires, v. 26, p. 102-113, 2007.

e-ISSN: 2446-7154
(cc) BY-NC-SA

About the authors

Milagros Elena RODRÍGUEZ

Christian, Venezuelan. Post-Doctor Student in new trends and integrative currents of thought and its concretions, José Martí University of Latin America, Cuba, PhD in Mathematics Education, Thought and Reconnection in Transmodernity, PhD in Educational Sciences. PhD in Educational Innovations. PhD in Cultural Heritage. Master of Mathematics, Bachelor of Mathematics.

Processing and publication by the Editora Ibero-Americana de Educação.
Correction, formatting, standardization and translation.

BY-NC-SA