




[Between] the Paintings of the Ndebele Houses: [Geo]metries and Ragged Curricula

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ABSTRACT

Context: The implementation of Law 10.639/2003 on the Teaching of Afro-Brazilian History and Culture in Schools has demanded from Mathematics Education several studies and problematizations about the nature of the [M]mathematical knowledge present in school curricula. This Law prompts dialogues between different epistemologies, whether of Western origin, Afro-Brazilian origin, or in between these epistemologies, in order to produce new debates that fray the disciplinary logic, neutrality, universality, and uniqueness of Mathematics. Thus, based on the practice of painting houses, which is carried out by women from the Ndebele people of Africa, we can consider the curriculum a place of invention. **Objectives:** Learning from the Ndebele women, what paintings can emerge? Are curricula invented when Stories and practices of African cultures become the focus of study in Mathematics classes? **Design:** We are guided by an intervention-research, performing a review of ethnographic investigations on the sociocultural practice of painting Ndebele houses. **Environment and participants:** The research begins with the subjectivity processes that cross three researchers: two mathematical educators in different stages of life and a philosopher. They are all interested in following different paths with Mathematics Education, Ethnomathematics, Philosophy, and..., which make us professors, determining our conceptions of territory and research. **Data collection and analysis:** The records and data of this research were produced based on the works of Paulus Gerdes on the paintings of Ndebele houses, as well as other authors of African origin, allowing us to be affected by these productions and question the homogeneous curricular models. **Results:** With this research, we travel to Africa to find strange the mathematicS practiced by the Ndebele community and to make the mathematics curriculum strange; in this sense, contemplating knowledge at the crossroads of the

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school curriculum, Law 10.639/2003 and Mathematics, entails producing a notion that is closer to the affective field than the field of meanings. **Conclusions:** The experience of shifting sociocultural practices to the classroom, such as the sociocultural practice of painting Ndebele houses reveals a curriculum as a place of invention in which mathematicS takes place and composes other curricula capable of painting a different use for Law 10.639/2003 fraying Mathematics' neutrality, universality, and uniqueness, and developing a school curriculum that escapes, leaks, and spreads minor, distinct, and unusual knowledge.

Keywords: Ethnomathematics; Education for Difference; Africa; Mathematics Education.

*Two paths were open to him:
that of the infinite without,
that of the infinitesimal within.
And he chose the infinitesimal within.
Where one need only squeeze
the spleen,
the tongue,
the anus
or the glans.
And god, god himself squeezed the movement. (Artaud, 2014,
s. p., our italics).*

INTRODUCTION

We want to provoke you to think differently about schools, based on what we have learned from different studies (Da Silva & Tamayo, 2021; Tamayo & Paulucci, 2021; Giraldo & Fernandes, 2019; Dora & Clareto, 2017, among others) in which we dialogue with other kinds of MathematicS¹, which has allowed us to question the disciplinary logic and the uniqueness of meanings produced in the most common uses of this last word. We question

¹ Writing with the capital letter "S" at the end of the word 'mathematics' [or the word 'ethnomathematics'] uses language to challenge metanarratives and distance us from the essentialisms of the question "what is mathematics". We associate the term mathematics with a science that seeks to "generate new spaces for the creation of new understandings that are generated in border areas that escape the canons" (Orjuela-Bernal, 2018, p.11), as we consider (Ethno) Mathematics [with initial capital] to be an area or set of institutionalized, hegemonic, and Western elements. The "matemáticaS" (mathematicS) project developed by the Phala Research Group and the LABJOR of FE-UNICAMP inspired this variation.

the role of Mathematics as a school subject and the alternatives proposed by ethnomathematics in the implementation of Law 10.639/2003². Using this as a starting point, we will travel to Africa to learn about the paintings of the Ndebele people's houses and their ethical, aesthetic, and political potential for Mathematics Education through a review of ethnographic investigations.

We are guided by a research-intervention, a methodology that speaks of the processes of subjectivity production emerging from sociocultural practices, as a tactic to radicalize the deconstruction of the dichotomy subject/object of research. We propose a movement in which knowledge and action are co-produced, allowing "new realities, new questions and new subjectivities to be created. After all, thinking is the act of inventing" (Paulon & Romagnoli, 2010, p. 95). Because the research context is assumed to be stable, fissures capable of promoting "a displacement of the contradictions perceived in reality towards immanence and the relationship with what comes from "outside" are sought - what is captured in exteriority, "on the skin," and which combines established forms and inventive forces" (*Ibid.*) are searched as a statement of a political act.

Furthermore, the investigation does not walk with predetermined goals; rather, it finds its goals along the way, reversing the traditional meaning of the term method. It does not seek truth or falsity, a beginning or an end, but it begins in the middle, tracing existential territories, transcribing a map of thought that approaches Mathematics Education as a space of relationships "full of marks and well-established chains, to decode them, that is, to include new arrangements there and then be able to extract new relationships with the environment" (Paulucci, p. 75, 2022).

If, on the one hand, this investigation understands the paintings of Ndebele houses beyond any kind of 'translation' or 'interpretation' that can be elaborated based on Euclidean geometry, it does not reduce them to works of art exclusively. The theoretical reference itself invites us to swing in the rhythm of the brushstrokes, towards an unfinished history, of an activity in motion, and thus fleeing any desire for crystallization interested in determining what we will

² Law 10,639, enacted in 2003, mandates the study of Afro-Brazilian History and Culture in both public and private primary and secondary schools, including the "study of the History of Africa and Africans, the struggle of the black people in Brazil, Brazilian black culture and black people in the formation of national society, rescuing the contribution of black people in the social, economic, and political areas relevant to the History of Brazil" (Brasil, 2003).

call sociocultural practices, that is, an organized set of actions that summon knowledge and the understanding of a specific people (Tamayo & Tuchapesk, 2018).

For this journey, we bring a translucency from Antonin Artaud and Gilles Deleuze to dialogue with the multiplicity that crosses the notion of knowing. We discuss learning about the practice of painting Ndebele houses articulated to the concept of *cruelty* (Artaud, 2006) in order to produce affectations about African history in Mathematics classes. We use the term *cruelty* in a broad sense, derived from the "Portuguese translation of *crucor*, from which *crudelis* derives, designation for scorched and bloody meat, as well as *crudus*, which in turn designates raw, undigested, indigestible" (Rosset, 2002 apud Oliveira & Paraso, 2013, p. 627). In fact, we move from cognitivism to seek possibilities in experimentation to consider how Mathematics classes can coexist with Ndebele History and Culture, mediated by the tension between world forces and life forms.

This writing is the result of a first approximation between the Mathematics class and the teaching of African History, which, when reconstructed in memory, continues to be a concern, influenced by emerging discussions of a research developed in the Specialization in Education course: Science, Technology and Society at IFSP³ (Sao Carlos - SP). Elaborating problematizations from the philosophy of difference, willing to spawn inventive ways of outlining a school that seeks to overcome benevolence and goodwill toward difference, seeking the relationship between epistemologies as a resistance to homogeneous models of school (mathematical) curricula.

Considering the complexities of working with the concepts of Culture, Identity, and Difference, as well as the poetic polysemy that we assume in the word paint [throw on traces, colors; figure surfaces; draw Mathematics, stories; giving life to philosophies, anthropologies; paint the seven!⁴;...], we are led to ask: which ~~geometries~~ paintings can emerge from learning with Ndebele women? When African cultures' stories and practices become the focus of study in mathematics classes, are curricula invented? "Can a curriculum be invented? "What mathematics for an invention curriculum?" (Dore & Clareto, 2017. p.1).

³ The Federal Institute of Education, Science and Technology of São Paulo.

⁴ An expression used to describe the act of playing pranks or causing mischief... Making a scene; having a riotous fun; making the most of a situation.

These questions operate through the scares of a rhizomatic⁵ path and its lines of intensities as possibilities for a life-multiplying Mathematics classroom, rather than the search for ultimate and totalizing fundamentals.

FIRST TRACES

How are subjectivity processes formed if not through mutable relations, passages of a running time that sometimes rests and relocates everything in one blow? That is, a continuous process that interrogates more or less known signs before returning to non-linearly machining the body. The past and present do not admit hierarchy; instead, differences emerge from time to time. Where? Exactly, we don't know.

[...] after the order
of this world
there is another.
What is it like?
We do not know.
The number and order of possible suppositions in
this realm
is precisely
infinity!
And what is infinity?
That is precisely what we do not know. (Artaud, 2014).

This section focuses on the subjectivity processes that cross the authors of the article: two mathematical educators in different moments of life and a philosopher. This time frame could be called first traces, but to avoid any hierarchical correlation, we will call it traces. These are the paths taken by Mathematics Education, Ethnomathematics, Philosophy, and so on, which shape us as educators, determining our concepts of territory and research.

⁵ The rhizome is a concept developed by Deleuze and Guattari (1995) through several entries. The authors propose the rhizome as an alternative to the arboreal and hierarchical systems, that is, as a deviation from the Cartesian straight lines. It is accompanied by the confusion of spreading connections, multiplying, and allowing the possibility of creating new meanings. "The question is how to produce the unconscious and, with it, new statements and other desires: the rhizome is this unconscious production itself" (Deleuze & Guattari, 1995, p. 28).

From displacements provoked in us by sociocultural visions of Mathematics Education, we dedicated ourselves to studying possibilities of articulation between the teaching of Mathematics and Law 10.639 of 2003 that regulates the Teaching of African and Afro-Brazilian Culture in Brazilian schools, articulating the Mathematics Education to anti-racist struggles because,

In the search for Peace, it is not enough to do good Mathematics; one must also do mathematics imbued with ethical values, which is a concept that many find meaningless. The challenge is to give the concept of Mathematical Ethics meaning. To accomplish this, it is necessary to reassess the History of Mathematics, attempting to understand when, where, how, and why Mathematics and Ethics became separated (D'Ambrosio, 2011, p. 69).

That is, we begin with the conviction that there is a need for a Mathematics Education that recognizes and questions the privileges of hegemonic groups, and that breaks with the silencing of Afro-Brazilian or African-derived knowledge in (school) curricula. This concern stems primarily from the belief that versions of history approaching the theme of black African slavery are insufficient in revealing a web of physical and symbolic violence. Despite the little-explored richness, influential in the expressive link with Brazil, a difficult to undo face is placed in place of Africa's heterogeneities, causing stereotypes and scars to cross the ocean and reach school education.

Raising the African and Afro-Brazilian cultural presence in society, particularly on the subject of slavery, does not, however, guarantee an escape from what is already in place, namely the hierarchical chains of *coloniality of power* (Quijano, 2005). State policy movements are becoming increasingly complex, making it difficult to avoid discourses that justify colonial difference and disembodied and delocalized knowledge, which are frequently juxtaposed with modernity's epistemology (Walsh, 2003).

Initially, mediated by the intellectual and ethnographic production of Paulus Gerdes (1989; 1995; 1997; 2001; 2011) we designed, at different times in our careers, maps for visiting Africa. Gerdes' books thereafter represented a perspective that narrated elements of Mathematics, particularly [Euclidean] geometry, from different African regions, recognizing in traditional production techniques, Mathematical ideas, a political stance that he claimed through Mathematics Education or Ethnomathematics, the transformation of colonization stigmas into a modern, independent culture (Gerdes, 1988).

During the readings, Gerdes left an important question for the realization of his work:

[...] “Why are these products shaped the way they are? [...] Once the mathematical character or aspects of the cultural elements are identified, one can attempt to trace the history of the mathematical thinking involved, as well as its (possible) relationships with other mathematical-cultural 'threads,' and *explore its educational and scientific potential*” (Gerdes, 1995, p. 199, our translation. Our italics).

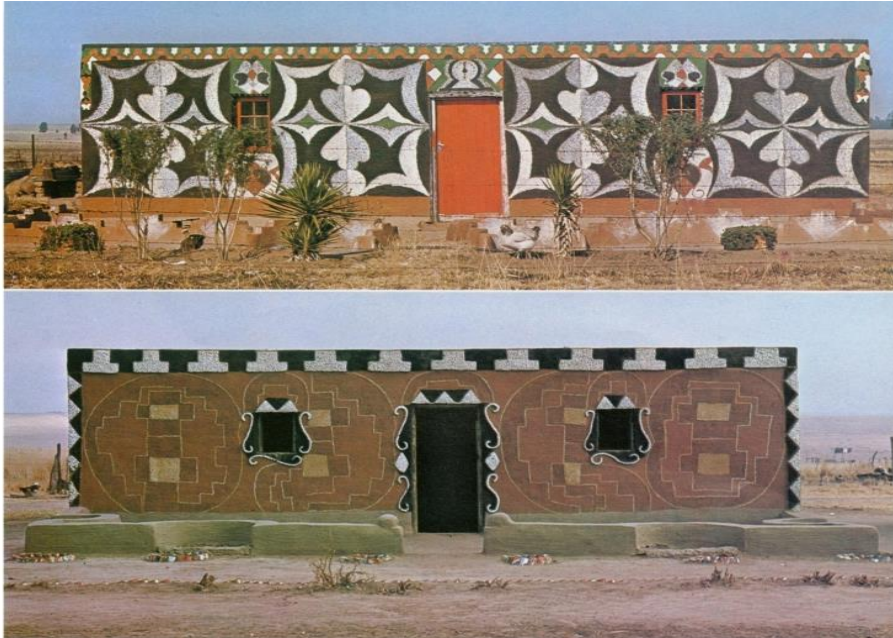
The beauty of the so-called *ikghuptu*, that is, the traditional painting style of the walls of the Ndebele people's houses, which gave color to the shapes using “[...] natural ocher paints of soot, ash, and clay obtained from the land, white, red, or yellow,” was one of the entries that were decisive for the map of this trip (Gerdes, 2011, p. 139). Later, with the addition of the color blue, derived from indigo, powder, and acrylic paints, *pewulani* emerged as a more colorful writing style. These paintings, created by Ndebele women in Zimbabwe and Southern Africa (see Figure 1), tell the stories of a people, their political and moral organization, and, most importantly, the ways of life that are influenced by an education that goes beyond traditional habits of schooling and the school curriculum.

Gerdes, for his part, sees geometric shapes and symmetry patterns based on Western mathematical methods in the paintings of Mpumalanga, South Africa. With this perspective, a Mathematized territory and its rules emerge; an attempt is made to exhaust the signs that involve the practice by reducing them to Euclidean geometry's "circular", "rectangular", "axes of symmetry", "central, lateral and vertical symmetry". Why limit the *ikghuptu* practice to forms when the richness of "translation" lies in its mystery? What happens if we abandon our desire for Euclidean geometry?

If, on the one hand, these transpositions can aid comprehension of a set of Mathematics rules, making Ndebele women's socio-cultural practices an object of (school) Mathematics study, a nagging question remains: is this the only possible relationship between the subject of [M]mathematicS and the history of this African writing? How far are we willing to decolonize our gaze? Are we incapable of undermining the borders of a school-territory or a Mathematics-territory imbued with *coloniality of power*? The question that arises is: is there another order, which borders on the first and opens fissures in favor of a living knowledge in the [M]mathematicS classroom, behind this conscious order? Does this invent a new curriculum? What kind of curriculum?

Figure 1

Photographs of houses covered in Ndebele paint (Rohrmann, 1974)



Introducing Law 10,639 into the MathematicS classroom entails investigating the discipline's powerlessness in relation to the non-disciplinary socio-cultural practices of a specific African group. This allows access to chaos that is sufficiently organized so that one does not become lost in madness while looking for a less colonized (and thus less well-rooted) classroom. We can express other forms of affection through the paintings of Ndebele houses, which, as *nomadic knowledge*⁶, refuse to be compared, standardized, translated,

⁶ In *A Thousand Plateaus*, Deleuze and Guattari developed a discussion around what they called a 'royal science' (or, even, major science) and a 'nomadic science' (or, even, minor science), in this direction we speak of knowledge produced within the framework of a science that escapes, resists, and subverts the State's disciplinary policy. It is a deterritorialized knowledge "that flows... crosses borders... is not private... from a band... nomadic... vagabond. Moreover, it is amalgamated with the context in which it is produced, quite different from the logic that sustains the major

or determined as mathematical practice due to the fact that the women's traces determine spaced forms on the clay walls of this people's villages (Tamayo & Paulucci, 2021). We recognize that knowing about these characteristics entails experiencing them together, willing to be guided more by the affective field than by the meaningful field.

This enables not only a counter-hegemonic curriculum that knows exactly what territory it intends to cover, but also a curriculum in the movement of differences, alive, that claims territories in eternal creation for itself, enabling not only a relationship between bodies and knowledge, but also learning from what can happen when these bodies come together. In this sense, we speak of living knowledge, referring to a process of experimentation with the layers of the self, which, from the standpoint of affectations, is coextensive with the existence of the other. Because it is always in motion and immanent, living knowledge transforms relationships into a non-given construction, a multiplication of meanings extracted from the weaknesses of a territory, a place from which its powers are also extracted. Curriculum is defined as a process of "updating the potential of the classroom as a collective of forces" (Clareto & Nascimento, 2012, p. 317) that goes beyond a set of truths assumed to be educational values in a classroom.

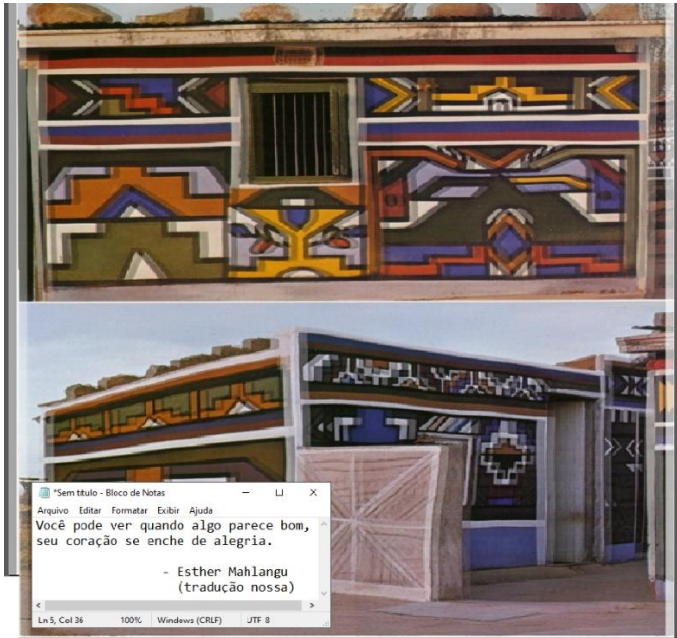
Our ~~first~~ traces are not intended to qualify one way of acting in teaching or research, but rather to encourage the breaking of certainties belonging to a tiny wall, Mathematics, and institutionalized meanings for the school at the expense of an infinity outside. It is there that we can emphasize other ways of doing MathematicS, dialoguing with African culture and history, without necessarily excluding Mathematics, but identifying the existing power relations there, in order to walk through the frontiers that break with the method, pedagogy, or any will to possess.

That is why they are traces with no predetermined directions, drawings in multiple orders at the same time, without linearity, circulating insofar as good and bad are evaluated, not by God's judgment [or the reigning morality], but by the functioning of the connections, escaping here and reconnecting there, according to the powers of existence of a body.

science, which strives to constitute a disembodied knowledge of the human that results in an idealized framework" (Duarte & Taschetto, 2012, p. 98)

Figure 2

The cheerful colors of Ndebele paintings. (Adapted from Rohrmann, 1974)



IN THE MIDDLE OF THE WAY THERE WAS A PRACTICE. THERE WAS A PRACTICE IN THE MIDDLE OF THE WAY...

A need then arises: in the [M]athematicsS class, how do Ndebele paintings work? We could think like Gerdes:

[The] portions of the front wall of a house may show a pattern. “The pattern has a *bilateral symmetry* and is composed of *rectangular patterns*. [...] The design, both as a whole and in its constituent elements, has two *axes of symmetry*. (Gerdes, 2011, p. 141, our italics).

Alternatively, we can learn more about these women's practices by exploring the versions described by various authors who take African voices as their starting point, broadening our perspective. From this viewpoint, we understand that encountering the energy that crosses a slice of the Ndebele

people requires a navigation tip on a very unique journey, a break in the cognitive function that allows us to discover the strange. In the words of Virginia Kastrup,

The traveler's trip differs from the tourist's trip in that the tourist leaves with a trip planned, they leave so as not to find anything strange, they take their home on their back, they want to go to the same type of restaurant they go to in their home town, seeing the same kind of people they also see, using the same type of transport they take,... preferably being with the same group of people. So, these are two very different trips: the trip that is more open to strangeness and invention, and the tourist trip that is more of a trip without leaving the place... in order not to leave the place. Therefore, traveling in the form of a traveler is very nice. And it's also very good when you travel and that estrangement comes back with you when you return to your own city and you come back with your eyes a little... unencumbered from the everyday life you have there. You often manage to become more sensitive and open to traveling in your own city, home, and life, right...? (Kastrup, 2019. Lecture available at LECAV⁷).

As a result, our journey is not predetermined by a - Euclidean geometric - itinerary, but instead it brings to the surface stories that could only stamp a composition of bodies as the opposite side of completeness. Our stories are traces of encounters that travel with us as we travel through them; could it be any different? What can we learn from a moving practice? Even "ethnographies" are scholarly constructions; but not the people they study. Recognizing that the creativity of these peoples is greater than what can be understood by any analysis is part of the anthropological exercise" (Strathern, 1988, p. 12). It is left to us to assume that what we see is a snapshot of a moment soaked in affective conditions.

Thus, we entered by location; not at the beginning, but where we can grasp, through the path of a group of tribes that live in three main groups: in the east of South Africa, in Gauteng and Mpumalanga, around the cities of Potgietersrus and Pietersburg, also in South Africa, and in Zimbabwe's Matabeleland region. The Ndebele people, a Nguni ethnic group, are not many, which has not stopped them from gaining international attention since the

⁷ Available at: <https://youtu.be/mTWns8ACYDU>.

twentieth century, due to their famous paintings on the walls of their houses, clothing and objects with very colorful graphics, an inherited tradition between women of the same family (Ndebele, 2011; Medina, 2016).

Ndebele (2011) reports that during the 17th century, in the territory of present-day KwaZulu-Natal, there were intense disputes over Ndebele leadership, which caused this people to disperse. Following the death of Musi's heir, the rivalry between his sons divided the community, causing supporters of various speeches to occupy different territories. Part of the people followed Ndundza to present-day Belfast; others moved to the vicinity of present-day Zebediela and then migrated to the region of Potgietersrus and Pietersburg; some settled in one region and fled to Zimbabwe after a dispute with the Shaka; and still others dissolved into different regions.

Years later, the Ndebele's house painting practice is what brought us closer to them. One clue to the emergence of the activity points to the struggle for land: black indigenous people resisting the attacks of white settlers' oppressive epistemological structures (Florentino & Oliveira, 2012; Dube, 2018). Their way of drawing on walls appears to be an expression of an identity capable of uniting and combating colonial threats, and it also demonstrates their eagerness to keep their culture alive, an activity that positions women as protagonists in the work of physical and symbolic home conservation. If before the architectural work of houses was directed to the male gender, when men started to leave their homes to work in nearby cities, women took on this responsibility (Medina, 2016) not as a limitation of what a female body can do, but as attention that enhances existences

The paintings, like any sociocultural practice, provide the results of relationships that vary by region and thus point to different contexts in which the figures color Ndebele history. Dube (2018) discusses paintings as expressive symbols that communicate a group's experience and philosophy, which is closely linked to its cosmogony; similarly, Florentino and Oliveira (2012) include the intersection with the rites of passage from childhood to adulthood; and Courtney-Clarke (1990) exemplifies the protest tone of women in South Africa who wrote their murals with illegal colors.

The act of painting on murals is almost entirely carried out and led by women, with the complex shapes drawn being legacies left to their daughters, who rarely stray from the drawings they learned at home as children, at least at first. As a result, "it is not uncommon to see children as young as two or three years old lined up silently under a mango tree, attentively watching their mother transform a dull brown house into a thing of beauty" (Molife, 2002, p. 16, our

translation). In Esther Mahlangu's culture, a well-painted house displays her femininity and her care for the home, as a good mother and wife, which naturally brought a certain nervousness in her first paintings: "you were putting all your knowledge and understanding on that wall for everyone to see. A good painting would earn you instant respect. But if your project didn't work out, the older wives would mock you." (Smuts & Getz, 2015, p. 18).

The painted walls communicate the stages of life, such as the birth of a child, thus referring to a symbol of fertility and status in the community as a mother; the marriage of a daughter; or the period of initiation of children, by displaying a deep network of complexity. The time of initiation is a period that mobilizes the entire community, and while women painting their walls is not as common today, it is natural among the Ndebele for the correspondence between brushstroke writing and the time of initiation. Puberty is a critical developmental stage, therefore "it is not only about the identity [of] individual children, but it is a type of socialization that will allow [the] children to acquire social values" (Ndlovu, 2017, p. 186, our translation).

Color is added to the houses during dry periods. The paintings are created with the expectation that the December rains will wash away the color and leave fertile and flowering fields in their place. The ancestors' ritual is carried out by an important feature of the colors poured on the murals: their clay base. The use of powder and acrylic paints in recent years has increased the color options when applied with feathers or twigs with frayed ends, but the first paints were produced. Red, orange, brown, rust, beige, khaki, and black colors were created from a mixture of clay and cow dung, pigments that often required traveling kilometers searching for materials (Courtney-Clarke, 1990; Molife, 2002), and the energy to transport containers weighing up to 23 kg.

Clay circumvents subjectivities more than it builds the physical structure of the community. Clay, an element that pervades this culture's feminine activity, guides a specific knowledge that feeds the relations of belief and social organization inherent in non-school education and politics. It is a material for building and painting the walls of houses, but it is also a process of knowledge production with an outlet in a body that is constantly modified along its territory.

What the paintings set in motion crosses a range of beings, both human and non-human, and culminates in female vigor. In fact, we don't know if this distinction is clear, or even if the Ndebele women's hands serve as conductors of the brushes beneath the walls. From the politically affected community by the affectations in/of the paintings to the vibrant nerves with the acceptance of

the female community and the attentive eyes capable of specifying painted subjects without any measuring instrument, the entire body participates.

The shapes and color harmony are elaborated with unparalleled care, illustrating three of the most common themes in Matabeleland, namely the *intaba* [mountain], *isayobe* [spider], and *ilanga* [sun], in addition to other popular images referred to by Molife (2002) as band, step, geometric, and plant. While spelling, themes can affirm a community's philosophy and life experience, as in the case of the *chevron* sign, a "V" shaped unit that can be placed in any direction. One of the Ndebele residents encourages in an interview:

The rising and falling pattern reveals the life we live in this world. All people fall but rise again, and a community faces many challenges but still triumphs. If someone falls or finds themselves in a difficult situation, don't let them give up and accept defeat; instead, encourage them to fight on in the hope that tomorrow will be a better day, and the day after that even better, and so on. This is our life, full of ups and downs." (Dube, 2018, p. 34, our translation).

We are no longer confronted with forms and spaces, but with times that differ from those of Euclidean geometry, an up and down of the hand in interaction with paints that reveal the lives of women, men, children, and young Ndebele who live in this world, who live their Africa.

Given this scenario, the history that is stamped in the twenty-first century dates back to a generation of young people who were uncomfortable with the culturally prescribed forms, but who still defended their Ndebele identity and their desire to learn more about their history (Ndlovu, 2017). If mural painting has been declining as a sociocultural practice since the end of the 1980s, previous generations have quickly responded to these changes by attempting to teach and encourage traditional knowledge. Esther Mahlangu and Francine Ndimande are two well-known South African painters who were interested in preserving the activity by insisting that students first master clay pigments before using acrylic paint (Malatije, 2015). Learning with clay supplements an extra-curricular, non-colonized education by stimulating knowledge and reactivating important memories for this people.

Esther was one of the first women to introduce her wall designs in stylized canvases and ceramics, elaborating and varying the most vibrant colors of her tradition to acquire another value and function. We speak of the political

character claimed by Esther Mahlangu, by allowing her painting practices to also be seen as art, an attitude that places a certain epistemology, commonly thrown to the margins, to take advantage of the power relations that cross the practices baptized by the language of "art". The term "art" is invoked in this legitimization discourse for the purpose of resistance/insurgency. Dr. Esther Mahlangu, a graduate of the University of Johannesburg, occupies a mixed space in the world by traversing what Western humanity calls Ndebele Art: her exhibition has both individual and collective credit in European and American museums.

Figure 3

Chevron symbol and spirals. (Dube, 2018, adapted by the authors.)



When it comes to museums on this trip, we find an ironic Western euphoria surrounding paintings with a history of colonial resistance. Nonetheless, there are various perspectives on what Mahlangu's art awakens. Jamal's gaze (2015) detects a strong appeal to joy, adding that if the story hurts, Esther's canvases are a true antidote to pain, all in a multiple movement that tensions the figurative and the abstract, always adapting through mediations. For a variety of critics, the artist's work emerges with an inconstant value

between culture/ethnicity and the possibility of going beyond its prescribed meanings.

Outside of museums (Mathematics classrooms), the paintings that set in motion the lives of Esther, Francine, and other women who followed the rituals of a people have recently received a tourist motivation (Courtney-Clarke, 1990) that attracts visitors who want to negotiate a tour of the colorful houses.

What are Ndebele paintings? Exactly, we don't know. At the [provisional] end of the journey, we are more concerned with forcing fissures that extend the path of the journey to the classrooms than with finding a foundation for a practice. We are interested in exploring signs that force us to produce other, different Mathematics, mobilized by the need sharpened by the desire in the encounter with the stories of the Ndebele paintings. Other mathematics is the result of other, transformed lives. We are interested in going into what escapes form, what escapes mathematical *reproduction*⁸, where "[...] a decorated rectangle appears that presents a *central symmetry*, [...] under a *180 turn*" (Gedes, 2011, p. 143, authors' emphasis) and overflows our epistemological systems. We are motivated by a desire to investigate effective ways to make a curriculum travel, leak, and overflow.

PAINTING OTHER MATHEMATICS WITH LAW 10.639/2003

We believe in the possibility of transcending the semiotics in which Mathematics [Education] participates by broadening the ways of knowing and doing Mathematics without colonizing it. Referential knowledge is not required for this, whether it is the product of a selective humanity or a minority group; rather, we appropriate a notion of culture in which the senses are not interested in closed mechanics and a supposed generality; rather, it is more important to draw the unique determining power of culture, to be able to escape significance without further significance. If the term culture is useful to us, it is because of its procedural nature; that is, "in an expression like 'invention of

⁸ We consider reproduction to be synonymous with representation because a form of affectation that results in a resemblance exercise can become a colonizing image of practice. We forget that what we consider ideal is actually an invention, a network of carefully crafted connections. Given this ideal, we risk always rejecting a simulacrum in order to approach copies that are covered in resemblance.

traditions,' the first term (invention process) should be much more important than the second (which was created)" (Goldman, 2011, p. 198).

We find support in another dimension of culture in Artaud (2006). There are those who define civilized people as those who carry out their thoughts based on their behavior, that is, those who are well informed about systems and forms, rather than those who identify their actions in their thoughts. For Artaud, however, "civilization is the culture that we apply and that governs even our most important actions" (Artaud, 2006, p.4), a perspective that gives rise to culture as an action, as a new organ that does not deserve idolatry or crystallization. Would culture be a way of exercising and comprehending life rather than an association with instruction, the latter wearing a garment that does not imply cultivation? The instruction at this point is simply

a varnish whose presence does not necessarily imply that this knowledge has been assimilated. Culture, on the other hand, means that the earth, man's deep humus, has been cleansed. (...) If Europe views culture as a varnish, it is because it has forgotten what culture was like when it was real (Artaud, 1936, p. 232).

How do these lenses influence a curriculum? Can culture be an ally in a life of unfinished realities, transformation, and becoming-other? We can exist in excess of a set of habits that have been established as our nature. Can the school occupy itself with interminable processes of interpretation and attribution of meaning to human practices, moving from the "divine" moment of creation to the "profane" moment of transmission, without losing the fulguration, uniqueness, and brilliance of "divine"? (Tadeu, 2002, p. 51).

We believe that in this movement between the 'divine' and the 'profane,' we can cultivate MathematicS that is not conditioned to representation in the school curriculum, not because recognizing Mathematics in practice is a false or fictional flow, nor because representation is exercised by a power relationship, but because it is one of the ways to strengthen what the capitalist West calls natural mathematics (Goldman, 2011). A sampling of African history is combined with MathematicS and a curriculum to emphasize ideas that become doctrines, lifestyles that become culture, and events that become history (Bene & Deleuze, 1978). Who knows, perhaps there is still room for a curriculum to shed its ghosts in order to find strange a Mathematics Education guided by (European) Mathematics marks.

Knowing the paintings of the Ndebele people's houses in Mathematics class means escaping from consciousness as the only possible effect both inside and outside the classroom. Otherwise, we would be promoting a Western Mathematics Education, a pedagogy of capital and its forces that is concerned with "[...] producing ourselves as strong beings in the economic field, but without any strength in the political field [...]" (Machado, 2016)⁹.

By transferring to the classroom sociocultural practices - such as the sociocultural practice of painting Ndebele houses (see figure 4) - that mobilize stories, knowledge, values, affections, and mathematics that are revealed in the event, we are subject to being captured by the discourse of disciplinary Mathematics, reducing culture to a base of epistemological criteria that do not correspond to it; this occurs because it is not uncommon for nomadic or mestizo people to be captured by the discourse of disciplinary Mathematics (Gallo, 2006, p. 552). This capture assumes Mathematics not only as pre-existing, but also operationalizes it (in research) as a correction standard for any sociocultural practice in accordance with the canons, as respected by the "paradigms defined by the state machine and by development agencies, using it based on well-defined methods and arriving at predictable and non-disturbing conclusions (despite often being of great importance and impact)" (*ibid.*).

With a sociocultural practice of painting Ndebele houses along the way, another question emerges for us: What other lives and geometries can be affected by the Ndebele people's gender patterns? All members of this people play an important role in their culture, allocating tasks based on gender and age groups, with women caring for the house and the common resources. In this regard, when Ndebele women perform tasks, such as making bricks, straw bundles, plastering and painting the walls, the creation of floor areas and the overall structure of the domestic space (Saho, 2011) is reinforced. A set of practices describing messages about fertility, community status, political and family rights, subjectivity issues, and finally, a set of knowledge in which women are participants and producers, or rather, a set of knowledge that escapes classical Westernized (patriarchal) conceptions of the feminine.

⁹ Claudio Ulpiano – Thought and Freedom in Spinoza.
<https://youtu.be/oBDEZSx6xVs&t=5861s>.

Figure 4

The practice of painting Ndebele houses. (<https://www.geledes.org.br/a-etnia-africana-que-usa-as-fachadas-de-suas-casas-como-tela-para-pinturas-coloridas/>)



We articulate *cruelty* in this movement of adding, raising the possibility of exploring the confrontation between what is usually taken as a dichotomy, whether between the Mathematician and the non-mathematician, the feminine and the masculine, the non-Western and the Western, everything in a great ball of subjectivity processes. Going unformed to cross the limits, to keep the presence of the other alive in me, also being the other, others of myself¹⁰;

¹⁰ “[...] There is no logic that guarantees the a priori and necessary direction of this movement, so we are confronted with a movement to change subjectivity. As a result, the concept of alteration appears to be more appropriate [than alterity], because [...] it is not about being another, and even less about making the relationship with the other that exceeds me a way of becoming a subject, but rather about making oneself become another.” (Galantin, 2017, p. 215).

deform because it is necessary to be incomplete to bring invention into existence, or, to paraphrase Artaud, to enter the state of cruelty.

[...] To exist one need only let oneself be,
but to live,
one must be someone,
to be someone,
one must have a BONE,
not be afraid to show the bone,
and to lose the meat in the process. (Artaud, 2014).

Having the opportunity to experience a school education as a combat situated between the joys that pass through us and the body that we have to build, an exercise in resistance to the atrophy of the senses that, in place of crystallizations, of forms, allows us to be shaken by the forces of the world, circumscribed by the thresholds of madness, is requesting cruelty for the use of Law 10.639/2003 (Artaud, 1978). Working with a tangle to the extent that one perceives the relationships that remain when the [M]mathematicS is stripped of categories, to produce assemblages without disassociating the symmetries of brushstrokes, colors, rectangles, forms of kitchen organization, lines, gender relations, angles, clay, joys and anxieties, and... and... and...

In this way, betting on a body that is formed and transformed as a result of encounters with other bodies, confronting our own culture and *mathema*¹¹, requires an understanding of knowledge as something that constitutes subject and object, which are thus not previously given. We prioritize the concept of inventive cognition or knowing as the invention of oneself and the world (Kastrup, 2001), with the process of differentiation playing a central role. As a result, we think of invention as the solution of problems raised by the shock of what we relate to but still don't know how to mean, seeking a different meaning in the experience of existence through another mode of subjectivation that is not directly oriented by the cultural repertoire (Rolnik, 2018).

We traveled to Africa to learn about the MathematicS practiced by the Ndebele community and to produce knowledge; learn MathematicS through the emergence of insurgent lines of each relationship with a given practice (Da Silva & Tamayo, 2020; Gallo, 2012; Deleuze, 1988). For us, the process is more valuable, the intermediary that not only imitates what Ndebele children are

¹¹ “[...] a progressive accumulation of objective truths which, however, will remain external to the man” (Larrosa, 2002, p. 28).

taught, but also combines with Ndebele painting practices, such as letting oneself be carried away by them, by being in tune with the ink, with the stages of life of this people's women. "It is necessary to be aware of what is going on, to be moved by the signs, for learning to occur." (Gallo, 2012, p. 7), "[...] in other words, learning is always meeting with the other, with the different, the invention of new possibilities; learning is the reverse of its reproduction" (Gallo, 2012, p. 8).

Painting another use for Law 10.639/2003 in the Mathematics class is, here, an effort to place Ethnomathematics to involve teacher and student with the practice of painting Ndebele houses, not to verify the Mathematics present in it, but to involve them with the purposes and the techniques that guide the women in the development of the practice, that is, to affect themselves with the paints, with the women's narratives, with the ways of inventing the paintings and with the power of signs (which involve not only the painted shapes not also the bodily performed actions) fraying the neutrality, universality and uniqueness of Mathematics and, creating a school curriculum that escapes, leaks and proliferates minor, distinct, unusual knowledge.

A commitment to taking the risks of learning from the heterogeneities of the classroom, rejecting the discourse that "Education for all" means the same education for all, in order to value the school as a "[...] social project and political more than necessary in our country; but that everyone has access to education according to their needs, according to their differences" (Gallo, 2012, p. 9).

What paintings can emerge from learning with Ndebele women? What we do know is that this learning can take many forms, so the paintings [strokes or colors cast; figured surfaces; Mathematics and drawn stories; philosophies and resurrected anthropologies] are also numerous. And, because man overflows to the outside of things, he is able to know beyond the point of view of meaning, allowing him to make and remake life with the principle that nothing should remain sacred.

Sometimes it is necessary for the school [as well as other institutions used to squeeze, including the very idea of the subject] to collapse in order to begin again; in the meantime, we can loosen until we have the right to say what was said and even what was not said in our own way, "immediate, direct, that responds to current ways of feeling, and that everyone understands." (Artaud, 2006, p. 62).

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The text emerges as part of the final EMP specialization research, supervised by MGD and CTO. EMP conceived the present idea and with CTO they built the theoretical-methodological basis. All authors, whether EMP, CTO and MGD, actively participated in the discussion of results, which were written, revised and approved for the final version.

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