

**Narratives of female mathematics undergraduates - whose bodies differ from hegemonic standards - about their formative journeys**

**Narrativas de jóvenes mujeres estudiantes de licenciatura en Matemáticas cuyos cuerpos huyen de los estándares hegemónicos sobre sus trayectos formativos**

**Récits d'étudiantes en mathématiques dont les corps s'écartent des normes hégémoniques à propos de leur parcours de formation**

**Narrativas de licenciandas em matemática cujos corpos fogem dos padrões hegemônicos sobre seus percursos formativos**

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**Abstract**

This article analyzes the trajectories of young women enrolled in math teaching training courses from the perspective of feminist epistemologies. The research is based on feminist epistemologies, investigating various facets of womanhood in different contexts. The body is examined through Butlerian and transfeminist perspectives, highlighting intersectional dimensions of black feminism. The study adopts a feminist qualitative approach and uses narrative interviews as a data source. Two Mathematics undergraduate students self-identified as feminists and with political bodies dissident from hegemonic norms (one black and the other transvestite) were interviewed. Data analysis includes the identification of singularities in the undergraduate students' narratives and the convergence of themes in the interviews. The results indicate that several women, as political bodies, foster an inclusive pedagogy based on social justice, questioning the pseudoneutrality of mathematics. They also highlight how the visibility

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of these diverse bodies in the relationship between teachers and students enriches mathematical education with a critical and engaging approach.

**Keywords:** Women in mathematics, Political bodies, Black feminism and transfeminism, Teacher training in mathematics, Narrative interview.

### Resumen

Este artículo analiza las trayectorias de mujeres jóvenes estudiantes de la Licenciatura en Matemáticas desde la perspectiva de las epistemologías feministas. La investigación se basa en epistemologías feministas, investigando varias facetas de la feminidad en diferentes contextos. El cuerpo se examina a través de perspectivas butlerianas y transfeministas, destacando las dimensiones interseccionales del feminismo negro. El estudio adopta un enfoque cualitativo feminista y utiliza entrevistas narrativas como fuente de datos. Se entrevistó a dos estudiantes de licenciatura en Matemáticas autoidentificadas como feministas y con cuerpos políticos disidentes de las normas hegemónicas (una negra y otra travesti). El análisis de datos incluye la identificación de singularidades en las narrativas de los estudiantes de pregrado y la convergencia de temas en las entrevistas. Los resultados indican que varias mujeres, como cuerpos políticos, fomentan una pedagogía inclusiva basada en la justicia social, cuestionando la pseudoneutralidad de las matemáticas. También destacan cómo la visibilidad de estos cuerpos diversos en la relación entre profesores y estudiantes enriquece la educación matemática con un enfoque crítico y participativo.

**Palabras clave:** Mujeres en matemáticas, Cuerpos políticos, Feminismo negro y transfeminismo, Formación de profesoras en matemáticas, Entrevista narrativa.

### Résumé

Cet article analyse les trajectoires de jeunes femmes étudiantes en licence de mathématiques sous l'angle des épistémologies féministes. La recherche est basée sur des épistémologies féministes, étudiant diverses facettes de la féminité dans différents contextes. Le corps est examiné à travers des perspectives butlériennes et transféministes, soulignant les dimensions intersectionnelles du féminisme noir. L'étude adopte une approche qualitative féministe et utilise des entretiens narratifs comme source de données. Deux étudiantes de premier cycle en mathématiques s'identifiant comme féministes et appartenant à des instances politiques dissidentes des normes hégémoniques (l'une noire et l'autre travestie) ont été interrogées. L'analyse des données comprend l'identification des singularités dans les récits des étudiants de premier cycle et la convergence des thèmes dans les entrevues. Les résultats indiquent que

plusieurs femmes, en tant qu'instances politiques, favorisent une pédagogie inclusive basée sur la justice sociale, remettant en question la pseudo-neutralité des mathématiques. Ils mettent également en évidence comment la visibilité de ces corps divers dans la relation entre enseignants et élèves enrichit l'enseignement des mathématiques d'une approche critique et engageante.

**Mots clés :** Femmes en mathématiques, Organes politiques, Le féminisme noir et le transféminisme, Formation des enseignants en mathématiques, Entretien narratif.

### **Resumo**

Este artigo analisa percursos de jovens mulheres estudantes de licenciatura em matemática sob a perspectiva das epistemologias feministas. A pesquisa fundamenta-se em epistemologias feministas, investigando várias facetas das mulheridades em diferentes contextos. O corpo é examinado através das óticas butlerianas e do transfeminismo, destacando dimensões interseccionais do feminismo negro. O estudo adota uma abordagem qualitativa feminista e utiliza entrevistas narrativas como fonte de dados. Duas licenciandas em matemática auto identificadas como feministas e com corpos políticos dissidentes das normas hegemônicas (uma negra e outra travesti) foram entrevistadas. A análise dos dados inclui a identificação de singularidades nas narrativas das licenciandas e a convergência de temas nas entrevistas. Os resultados indicam que várias mulheridades, enquanto corpos políticos, fomentam uma pedagogia inclusiva pautada na justiça social, questionando a pseudoneutralidade da matemática. Também ressaltam como a visibilidade desses corpos diversos na relação entre professores e alunos enriquece a formação matemática com uma abordagem crítica e envolvente.

**Palavras-chave:** Mulheres na matemática, Corpos políticos, Feminismo negro e transfeminismo, Formação docente em matemática, Entrevista narrativa.

## **Narratives of female mathematics undergraduates - whose bodies differ from hegemonic standards - about their formative journeys**

A prodigy who, after his death, would say: "I have lost a friend of twenty-five years, a great man who had no fault in being born a woman and whom all Paris regrets and honors" (Voltaire, 1956, quoted by Boucard, Lemonon, 2018, p. 10).

So said Voltaire, referring to Émilie du Châtelet, who was born in France in the 18th century, became a member of the Bologna Academy of Sciences, and became the only French translator of Newton's Laws. It sounds shocking, but it's a powerful statement that highlights the discrimination and challenges faced by women in the historical context in which Émilie du Châtelet and Voltaire lived.

Voltaire's quote is a reminder that despite the progress societies have made since then, gender equality and respect for women's achievements are still major challenges in many parts of the world. It is essential to continue to fight for equality and recognition of women in all fields of knowledge, including the so-called exact sciences, especially mathematics.

In the specific context of science and mathematics education, or more broadly in the set of fields usually referred to as STEM (Science, Technology, Engineering and Mathematics), the inclusion of girls and women is an essential issue for promoting gender equality and women's empowerment. According to the report "Cracking the code: girls' and women's education in science, technology, engineering and mathematics (STEM)" (Unesco, 2018), talking about the situation of women in the so-called exact sciences is about inclusive education, which is a fundamental approach to ensuring equal access to similar educational opportunities for all, regardless of gender, sexuality, ethnic or racial origin, social class, physical ability, or other social markers of difference.

In this report, the concern for this issue is clear, with a global, national, and regional focus. It recognizes that STEM education is an integral part of the Sustainable Development Goals (SDGs), particularly SDG 4, which aims to ensure inclusive, equitable and quality education to promote lifelong learning opportunities for all. Similarly, SDG 4 is about achieving gender equality and empowering all women and girls, meaning that through the articulation of SDGs 4 and 5, the document recognizes that gender equality in STEM education not only provides opportunities for women to advance in their careers, but also contributes to more sustainable development and more equitable and inclusive societies.

To achieve inclusive and equitable STEM education, it is important to create school and social environments that value and encourage girls' and women's interest in these fields. This includes access to adequate resources, inspiring female role models, support from educators

and guardians, and the deconstruction of gender stereotypes from an early age. In this way, society can reap the benefits of a diverse talent pool ready to meet the challenges of the future with creativity and innovation.

However, when we talk about education, subjectivities become even more relevant, as each student brings unique experiences, values and perspectives. By embracing the premise that "it's no longer about me, it's about us," we recognize the importance of fostering an inclusive learning environment that values and respects the uniqueness of each student. Open dialogue and the encouragement of individual expression allow students to feel heard and understood, contributing to a more meaningful and authentic education. In addition, by emphasizing the collective, we promote collaboration and teamwork, essential skills for meeting the challenges of today's world. Thus, by incorporating this "we" vision into education, it will be possible to build a solid foundation for the formation of citizens who are more aware, empathetic, and committed to the well-being of all.

We must recognize that the diversity of experiences and identities on the female spectrum is vast. It is essential to consider the multiple layers of subjectivity that make up the experience of being a woman, considering factors such as race/ethnicity, social class, sexual orientation, religion, ability, and cultural background. In this way, thinking about women is also one of the inert actions in inclusive mathematics education.

To explore the diversity and richness of women's experiences, Letícia Carolina Pereira do Nascimento<sup>3</sup> (2021) discusses the concept of "womanhood" as a way to highlight the multiplicity of historical and cultural experiences of the female gender. The use of this term aims to avoid the singular "woman," which can be limiting and not very inclusive, and emphasizes understanding the different ways in which social, personal, and collective experiences are lived by women.

By considering both "womanhood" and "womanhood", we can recognize the complexity of women's experiences and the importance of respecting and valuing the plurality of voices and experiences within the female spectrum. These concepts invite us to rethink gender stereotypes and promote a more inclusive education and society, where women can be seen in all their diversity and have their experiences recognized and valued.

The aim of this article is to analyze the training paths of female mathematics undergraduates from the historical perspective of the erasure of women in this area and feminist

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<sup>3</sup> We decided to highlight the full names of the people quoted, either directly or indirectly, in order to make them more visible.

epistemologies. Discussions were held about women in mathematics in a Eurocentric scenario and how this has defined places historically subordinated by the cis patriarchy<sup>4</sup>. The body is studied from a Butlerian and transfeminist perspective, with intersectional debates on black feminism. The research has a feminist qualitative approach and used (auto)biographical<sup>5</sup> narratives to produce data involving two collaborators, imbued with political bodies and identity representations: a white transvestite woman and a black cis woman.

### **Relations between women, mathematics and teaching**

The use of "gender" provides an opportunity to reflect on the teaching of mathematics by considering human relationships and the construction of knowledge in classroom exchanges. From this perspective, in this section we will briefly deal with four themes: i) Women and teachers, about the inclusion of women in the teaching profession; ii) Women and mathematics, about the occupation of women in scientific careers and the repression they have faced; iii) Women and mathematics teachers, focusing on the actions of female mathematics teachers; iv) Women and mathematics students, highlighting how girls relate to the subject. The search for research literature was carried out in Google Scholar, the CAPES Journal Portal, Scielo, the CAPES Catalog of Theses and Dissertations and the Brazilian Digital Library of Theses and Dissertations, considering publications between 2006 and 2021. Specific keywords were used for each subsection, and the selection of texts was based on their proximity and relevance to the research reported here.

Regarding the first theme, women teachers, the selected texts highlight common aspects such as subjectivities and the feminization of teaching in Brazil, especially in the early stages of education, highlighting the relationship between women and the teaching profession (Iria BRZEZINSKI, 2006; Patrícia Costa ATAIDE & Iran de Maria Leitão NUNES, 2016; Carlos Augusto Gomes Cavalcante SILVA, 2019). They also address the influence of identities and stereotypes on teaching work and pedagogical practices (Jarbas DAMETTO & Rosimar Serena Sirqueira ESQUINSANI, 2015; Ana Paula COSTA & Paulo Rennes Marçal RIBEIRO, 2011). Others focus on black female teachers and their role in the educational system (Glaucia Santana Silva PADILHA & Raimunda Nonata da Silva MACHADO, 2018; Lori Hack JESUS, 2018).

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<sup>4</sup> It is used to describe the intersection between the patriarchal system and conformity to cisgender gender identities. This term is used in transfeminist and gender studies contexts to highlight how the gender norms and expectations associated with patriarchy affect both cis women and transgender women in different ways.

<sup>5</sup> Maria da Conceição Passeggi states that the "parentheses could also signal that subjectivity was not seen from the intimate perspective of the self, since the focus of the method would be on learning, knowledge of the self and the other, and the individual transformation of those being formed" (2020, p. 65).

We can see the influence of motherhood, femininity, and vocation in the discourse and practices of these women teachers.

In relation to the second theme, women and mathematics, the studies refer to research on the scientific careers of women in mathematics, addressing the oppression they sometimes faced. The common points of the studies are the stereotypes that mathematics is a masculinized science, women's perceptions of doing mathematics in this context, and the relations of femininity and masculinity that exist in the field. The referenced research has a common agenda of addressing the situation of women in mathematics, highlighting the gender stereotypes associated with the field and the difficulties women face in entering and remaining in the field. They discuss the historical marginalization of women in the so-called exact sciences and how institutional norms can reinforce this exclusion (Jenny BOUCARD & Isabelle LÉMONON, 2018). In addition, these studies emphasize the importance of female representation in mathematics and the deconstruction of stereotypes that associate the discipline with a masculine science. This research also reflects on the differences in everyday mathematical practices between men and women and how such perceptions reinforce gender inequalities and influence women's choices in STEM careers (Suzanne DAMARIN, 2008; Alexa Nicole JAYNE, 2009; Maria Celeste Reis SOUZA & Maria Conceição Ferreira Reis FONSECA, 2008, Jane Cleide de Almeida CORDEIRO & Pedro Lúcio BARBOZA, 2021; David MILLE & Marcia LINN, 2014; Renata ROSENTHAL, 2018; Jeimy Marcela Cortés SUÁREZ, 2020). In this context, the need for women's empowerment in mathematics and for a more inclusive and diverse approach in this field are crucial issues that emerge from the studies presented.

The third theme, women and mathematics teachers, discusses how the symbolic violence suffered by women in the field of mathematics is rooted in practices and prejudices that perpetuate gender domination. We would like to highlight the work of Maria da Conceição Vieira Fernandes (2006), who analyzed the experiences of women mathematics teachers in Paraíba and found difficulties in accessing fields of science and mathematics, including reports of gender discrimination; and Mariana Feiteiro de Cavalari (2007), who mapped the presence of women in São Paulo universities, showing a significant increase in postgraduate students, demystifying the idea of women's biological incapacity for mathematics. These studies also revealed relevant regional aspects in Brazil and pointed to gender issues that permeate the teaching of mathematics, such as motherhood, family, double shifts and sorority.

In relation to the fourth and last theme, women and students of mathematics, we brought the works that showed that throughout Brazilian history, women have been prevented from having effective access to mathematical knowledge (Renata Caterine Gambaro Cleto da Silva,

2020). We found reflections on the influences they suffered through discourses that excluded them from the field of mathematics, especially at school age (Maria Celeste Reis Souza & Maria Conceição Ferreira Reis Fonseca, 2008; Otávio Henrique Braz de Oliveira, 2013; João dos Santos Carmo & Ana Claudia Toledo Ferraz, 2012; Juliana Boanova Souza, 2020) and the underrepresentation of girls (Felicia Jaremus, Jennifer Gore, Elena Prieto-Rodriguez & Leanne Fray, 2020; Julia Przybyla-Kuchek, 2021; Heather Mendick, 2005).

These situations still persist, with math being seen as a male subject and women facing stereotypes and prejudice in math classrooms. Foreign research also shows the influence of gender stereotypes on the mathematical performance of girls and women.

Reflecting on these issues is essential to promote gender equality in mathematics education and to deconstruct the totalitarian discourses that perpetuate conservative ideas in Brazil. Recovering the history of women in mathematics and recognizing their contributions can be a source of inspiration to encourage more girls to become interested and involved in the field. In addition, it is necessary to rethink how mathematics is taught, considering different subjectivities and seeking a more inclusive and diverse education.

### **Feminist epistemologies**

In this section, we will deepen our understanding of the formation of a scenario that determines which bodies can occupy mathematics. However, when talking about women, we cannot ignore the intersections that occur, that is, the multiple identities that are present in the "identity paths of racism, cis-heteropatriarchy and capitalism" (Carla Akotirene, 2020, p. 23) also in the field of mathematics.

Intersectionality is a theoretical approach that has become crucial in gender and race studies. It reveals the interconnectedness of different forms of oppression and recognizes that people's experiences are shaped by multiple identity markers. By adopting it as a category of analysis, we understand that oppression cannot be understood in isolation in terms of gender or race, but at least through the interaction of these categories, and can also add many other social markers of difference associated with exclusion and marginalization in our society. Luzia Bairros (2020) emphasizes its multidimensionality, not allowing a single identity and revisiting debates from different feminisms, enriching the understanding of feminist struggles and promoting more inclusive strategies to address social inequalities. In short, intersectionality helps us to better understand the complexity of oppression and to develop a more comprehensive and sensitive perspective for achieving gender equality and social justice.



We therefore consider the term cis patriarchy as a starting point for reflection on the formation of this scenario. The outdated concept of patriarchy is often applied only to the oppressions faced by white, cisgender, heterosexual and middle-class women. We follow Letícia Nascimento's (2020) suggestion to cover the different forms of oppression faced by women with plural experiences in today's classrooms.

The discussion about the simultaneous coexistence of oppressions has its origins in the Combahee River Collective, which was active in the US city of Boston between 1974 and 1980 and fought against racial, sexual and class oppression even before the concept of intersectionality became popular. Their 1977 Manifesto highlighted how black women faced oppression from childhood, being taught silence and invisibility. The struggle for access to education and valued jobs was emphasized as an important basis for combating these oppressions, as the freedom of black women is inextricably linked to the freedom of society as a whole. While Black feminism embraces the needs of other groups, many Black women face daily challenges that prevent them from fighting sexism and racism simultaneously, demonstrating the complexity of the intersections of oppression in their lives.

In Brazil, Suely Aldir Messeder (2020) highlights the prevalence of epistemological and academic constructions based on the knowledge of white and foreign men, neglecting local productions, emphasizing the coloniality of power and the supposed ethnic and cognitive superiority of the colonizer over the colonized. This entrenched view privileged European knowledge as the dominant rational explanation, disregarding "primitive customs" and marginalizing the local epistemes of colonized peoples, who suffered psychic trauma and lost cultural and spiritual meanings as they were subjugated by Eurocentric and colonizing knowledge (Carla AKOTIRENE, 2020).

In line with this, Jaqueline Gomes de Jesus (2014) argues that knowledge is shaped by the historical context, resulting in opportunities and conditions granted to the discourses and knowledge accepted in that chronological period. The temporal value judgment validates certain practices and determines who is considered real or not for certain epistemologies.

The construction of mathematical knowledge is not immune to these historical dynamics of power and exclusion. Eurocentric influences in the conception of mathematics as a neutral and objective field contribute to the marginalization of diverse perspectives and knowledge. The same bias that disregarded the epistemes of colonized peoples is perpetuated and reflected in the way mathematics education and research are structured (Victor Augusto Giraldo; Filipe Santos Fernandes, 2019).

It is in this challenging context, which requires critical analysis and action, that, according to Hygor Guse and Agnaldo Esquinalha (2021), the mathematical discipline, beyond its segregating and excluding aspects, can be instrumentalized as a tool for establishing and maintaining power relations, as well as for protecting those individuals labeled as competent in the subject. The supposed neutrality of mathematics, which is often illusory, contributes to this dynamic by creating a false idea of impartiality, which in practice can reinforce inequalities and marginalize certain groups.

In this way, it is important to consider when women have been represented in the context of mathematical knowledge, because historically, women's participation and contributions in this area have often been underestimated, neglected, or erased from academic records and narratives. According to Judith Butler (2021), representation is a political instrument that gives women legitimacy and visibility, but it also has a normative function in language and can portray them in a true or distorted way. The language of this political process is itself political, and it is for this reason that feminist studies have taken a leading role in these discussions.

In this context, Viviane Vergueiro (2014) criticizes the colonial language that naturalizes prostitution as an inevitable fate for the bodies of trans women and transvestites. She points out that these women's bodies carry a theoretical-political proposal that aims to decolonize notions of gender, as opposed to colonized bodies that are inferior, wounded, and violated by the system. Furthermore, as María Lugones (2020) points out, based on Quijano's reflections, Eurocentrism manages to insert people into patterns of power, resulting in the naturalization of situations under capitalist hegemony.

These critical perspectives on the influence of Eurocentrism on social and cultural organization highlight how this system of thought can perpetuate inequalities and oppression, consolidating power structures that privilege certain groups to the detriment of others. This understanding adds to Viviane Vergueiro's (2014) critique of colonial language that stigmatizes the bodies of trans women and transvestites, and points to the need for a more inclusive and decolonized approach to knowledge and mathematics education.

Mathematics as a discipline often presents itself with a colonizing perspective (Victor Augusto Giraldo; Filipe Santos Fernandes, 2019), occupying spaces that have historically been reserved for cis and white women. This context invites us to reflect on the absence of other bodies and identities that do not conform to these hegemonic standards. By questioning this exclusivity and seeking a more inclusive approach, we can open space for a mathematics that welcomes and values the diversity of experiences and knowledge of all social groups,

promoting a broader and more just vision of science and mathematical knowledge. In this context, a fundamental reflection arises: how do dissident bodies relate to this discipline?

Questioning how mathematics has historically been structured and represented invites us to explore how marginalized groups, such as trans women, black people, indigenous people, people with disabilities, and other identities, are affected by this exclusion, and how their perspectives and knowledge can enrich and transform the field of mathematics. In the case of this research, we worked with a cis Black woman and a transvestite White woman.

However, these are bodies that encompass the relationship between the individual body and the political and social context in which it is situated. The body is not simply a biological or natural entity, but is socially constructed through cultural norms, values and practices. These norms and practices shape and regulate how bodies are perceived, interpreted, and valued in a society. The construction of the body is therefore a political process that involves issues of power, control and regulation (Judith Butler, 2018).

The researcher also argues that notions of gender are performative, that is, they are constituted through repetitive acts and rituals that reinforce established gender norms. In this sense, the body politic also includes gender practices that shape people's identities and subjectivities in relation to social and cultural gender expectations.

Thus, from Butler's perspective, the political body is a concept that recognizes the interaction between the individual body, the social and political construction of gender identities, and the power structures that permeate society. It challenges binary and fixed notions of gender, emphasizes the fluidity and performativity of gender identities, and seeks to open space for greater freedom and emancipation for marginalized and dissident bodies. The presence of political bodies in math classrooms is an important issue that relates to Judith Butler's theories and the intersectional perspective. In these classrooms, students' and teachers' bodies are not merely biological entities, but socially and politically constructed bodies that carry identities of gender, race, social class, sexual orientation, and other characteristics that shape their experiences and interactions. Cultural and social norms act as political forces that influence how these bodies are perceived and treated in educational settings. The dynamics of mathematics classrooms can also reflect inequalities and oppressions that exist in society at large. The intersections of gender and racial identities, for example, can influence the ways in which students are encouraged or discouraged to excel in the subject, and bodies that conform to hegemonic standards are often easier to recognize and accept. Are these bodies capable of changing the way mathematics is produced, taught, or learned?

Teachers have a strong influence on their students' learning, as their pedagogical practices and conceptions of gender have a direct impact on the teaching of mathematics. Many teachers construct segregated spaces, following a cis-heteronormativity ingrained in our society, which ends up producing and reinforcing notions of masculinity and femininity during the educational process (Valerie Walkerdine, 2005; Maria Celeste Reis Souza & Maria Conceição Ferreira Reis Fonseca, 2010). This approach can limit the access and engagement of certain groups, such as women and LGBTI+ students, in STEM subjects and perpetuate gender inequalities and ability stereotypes in relation to mathematics. Therefore, how teachers approach mathematics education and integrate gender issues into their practice can have a significant impact on promoting a more inclusive and equitable education.

bell hooks (2020) points out that dialogue is a powerful tool for opening opportunities and giving voice to all people. In our classrooms, this exchange of ideas and experiences is a tool of resistance that fosters compassion and understanding among students. It suggests that through this interaction, what was previously invisible in each voice can emerge and be recognized. By fostering an environment of authentic and open dialogue, personal experiences become visible, allowing different perspectives to be considered and respected. This process can challenge stereotypes and prejudices, providing a solid foundation for building a more empathetic education.

Lélia Gonzalez (2020) highlights the presence of racist practices in the school system that can lead to black children being referred to mental health professionals with negative stereotypes, as well as encountering negative representations in textbooks and in the behavior of educators. These negative experiences can shape these children's perceptions of themselves, leading to a lack of identification with their own blackness. The author also points out that school ideology and child labor are significant factors in school dropout among black children, illustrating how education can reinforce stereotypes and inequalities. In the same vein, Viviane Vergueiro (2016) discusses the cisnormativity dynamics present in schools that result in the production of a gender pedagogy that excludes and violates trans people and transvestites. This reality goes beyond the silencing and concealment of these bodies, leading many of these individuals to drop out of educational institutions. School is a place where knowledge is used differently, which can lead to people not trusting the importance of their experiences and identities.

From a critical point of view, the school can be recognized as a space of potential intervention based on a liberating pedagogical theory, according to the perspective of Maria Clara Araújo dos Passos (2022). In this context, it is essential to recognize that there is no

neutrality in education, since it can also act as a producer of institutional "sacrificial mechanisms" that exclude and make it unsustainable for people considered "others" to remain in educational spaces.

In light of what Luma Nogueira de Andrade (2015) categorizes as "transvestilities," it is clear that the roots of transvestites are not exclusively linked to the exploitation of the body. On the contrary, they also come from less exploited spheres for their identities, encompassing a range of polysemic origins. It is unfortunate, however, that schools often perpetuate this normative approach by aligning themselves with this panorama. According to the scholar, this attitude often leads to many transvestite students abandoning their studies or being forced to submit to their guidelines in order to complete their academic careers.

In this sense, it is imperative that the school fully embrace its true purpose as an agent of transformation in the context of diversity. Its mission must be centered on the growth and improvement of students, with the goal of enabling them to fully integrate into society (Thiffany Odara, 2020). Consider, for example, "[...] the pedagogy of disobedience, which carries in its core elements elaborated from disobedience to a cisgendered order [...]" (Thiffany Odara, 2020, p.93),

These analyses highlight the need for a critical eye and a paradigm shift in the school environment to promote inclusion and respect for diverse gender identities and to create a welcoming environment for all people who study or work there. Mathematics education is not exempt from this scenario since it is found in schools.

It is in this context of being in the world as a woman, in a body that interacts and acts in the midst of an oppressive white cis-heteronormative system, that the math teacher plays her role. Given that these bodies reveal what is socially accepted or rejected in a scenario of political and socio-cultural interests shaped by the cispatriarchal system, we try to take a stance of resistance and cultivate sisterhood. In the face of resistance to the desires of the cispatriarchal society, being a math teacher requires the incorporation of these characteristics that allow us to address differences and promote a math education centered on social justice.

## Research paths

The methodological approach of this research is feminist qualitative, which we consider essential because it brings relevant epistemologies on gender and women to the work. According to Virginia Olesen (2006), these methodologies are emerging and diverse, women-centered, exploring experimental and textual theoretical essays, with a dialectical profile that incorporates diverse voices. This feminist qualitative research has the potential to open avenues for other investigations, actions, and policies that focus on and problematize different women's situations and the institutions that constitute them.

Given the existence of this relationship between the subjectivization of places and the production of feminist qualitative research, Virgínia Olesen (2016) emphasizes that the complexities that permeate this research are growing, both in terms of the nature of the research and the definition of the subjects, the researcher, and the knowledge established. In this scenario, the complexities emerge in the interaction between the knowledge produced and the subjects involved, making the field of qualitative feminist research a rich and multifaceted area of study.

The particularities that permeate the role of the researcher are shaped by historical nuances, gender, race, and class issues that will influence the approach of the study. These aspects provide a variety of research opportunities that focus on the intersections of structures and allow for the analysis of subjects' practices within hierarchical power dynamics. In the dynamic between the researcher and the researched, multiple identities and experiences emerge that contribute to the debates and discourses of the research, potentially influencing the construction of concepts by both parties (Virgínia Olesen, 2016).

Since then, we have chosen to use narrative interviews as a tool to generate data, due to their ability to provide unique experiences, respecting individual singularities, processes and choices (Elizeu Clementino Souza, 2006). According to Maria da Conceição Passeggi (2020), narratives are used to establish a link between the events experienced and those narrated, seeking a deeper understanding of "the nature of narrative as a 'mental instrument for constructing reality' and the self" (p. 60).

Our research was conducted during the Covid-19 pandemic, which began in March 2020 and lasted until December 2022, although life returned to some normalcy in 2022 with the use of masks and alcohol gel. Data production was done virtually to meet public health requirements, with collaborators filling out the informed consent form using Google Forms and choosing the names by which they would be referred to in the text.

The initial contact with the collaborators was via email or WhatsApp, inviting them to participate in the research through narrative interviews. Participants were selected based on referrals from people they knew, and were undergraduate mathematics students who identified as feminists. Once they accepted, the interviews were conducted via Google Meet, recorded with their permission, transcribed/textualized, and analyzed.

The transcriptions were made from the recordings of the video calls, paying attention not only to the words spoken, but also to the pauses and emotional nuances revealed during these moments. Our goal was to integrate the written text with the participants' accounts in the most faithful way possible. Textualization refers to the process of transforming thoughts, ideas, or information into text. It is the ability to express thoughts clearly and coherently through writing. This process involves the choice of words, sentence structure, organization of ideas, and other linguistic elements to create an understandable and effective text. For these reasons, we have chosen not to remove the language vices that appear in the students' narratives. The analysis is based on these texts.

The interviews were conducted by the authors of this article, who presented five thematic axes on a slide for the collaborators to choose an order and speak freely. The themes were: school experiences and relationship with mathematics; experiences as a woman in society; family, studies, work; teacher training; professional experiences. The interviewers intervened only after the collaborator had finished speaking on each topic, allowing the participants to express themselves freely.

The narratives of the two female mathematics students who participated in this research were analyzed using singularity and convergence analyses. The analysis of singularities, according to Renata Gilaberte Campos dos Santos (2021), Fernanda Malinosky Coelho da Rosa (2013; 2017), focuses on individual experiences and memories, looking for the particular discourses that outline the current positioning of the collaborators, intertwined with the theoretical discussions addressed. The analysis of convergences identifies common themes mentioned by both collaborators, highlighting their common interest in an emerging theme in their narratives, but not necessarily their opinions on it, as stated by Renata Santos (2021).

## Narratives of mathematics undergraduates

Based on the narrative interviews given by Lueji, from Rio de Janeiro, and Luma, from Fortaleza, we proceeded to analyze the data generated. First, we will address the singularities present in their narratives, highlighting individual and distinctive aspects. Next, we will explore the interests shared by both that emerge from their narratives, presenting an analysis of convergences.

Lueji, Brazilian-Angolan, was born in the South of Rio de Janeiro, but grew up in the North. She is a cis black woman, 22 years old, studying mathematics at a public university in Rio de Janeiro. She is also studying economics at a private institution. Her educational background includes a church-run nursery school, a municipal school up to 5th grade, and a private Catholic school after winning a scholarship. Lueji describes herself as truthful, communicative, sensitive and determined.

Luma, a white transvestite, is originally from Rio de Janeiro but has lived in Fortaleza since childhood. At the age of 31, she was in the last semester of her degree in mathematics at a federal institution, while at the same time taking a leading role in the student movement as general coordinator of the central student directory of the same institution. Her self-identification as a transvestite reflects a political position that seeks to expand her space and that of others, while highlighting the active presence of transvestite women beyond the confines of prostitution (Leticia Nascimento, 2021).

Lueji embodies a black body, a body of resilience and struggle that resists the normative pressures of whiteness. It is a femininity that exists at the limits of prevailing norms, a space that often remains invisible, forced into subjugation by the cruelties of colonialism (Maria Lugones, 2020).

In one of her narratives, Lueji reveals.

I say it like this because **I have an affectionate relationship with the people and teachers of that time**, but if I were to look deeper, **sometimes I felt like a fraud, I don't know if it has to do with some kind of psychological problem, but mainly in math, because I was seen as a good person**, because that's what I heard a lot, good at math. Sometimes **I would come home and cry because I thought I was a fraud, that I wasn't good and I wasn't enough, that I didn't know anything**. (Lueji, interview granted in 2021, emphasis added).

In this context, Lueji shares a facet of her journey, revealing that during her school years, she stood out as a skilled math student. However, this apparent academic advantage had deep emotional repercussions due to her low self-esteem. She saw herself as a fraud, so math



surprisingly emerged as a vulnerable point in her self-image. This discipline, in which she held herself to uncompromising standards and didn't allow for failure, became a territory filled with anxiety. The paradox of this situation lies in the fact that while academic excellence could be interpreted as an advantage for her mathematical proficiency, it also paradoxically fed her mathematical anxiety, creating a cycle of self-criticism. This complicated aspect, according to João dos Santos Carmo and Ana Claudia Toledo Ferraz (2012), was closely linked to the classroom environment, as well as to his interaction with colleagues and the complex dynamics of mathematics.

In one of his speeches, Lueji points to a concern about the university's distance from identity debates.

When I went to college, my attitude was different. Almost **in high school there was the boom of feminism, the boom of black feminism!** It was great! I went to college and I was already inclined to understand a little bit more about it, but what if I hadn't? You know, **it makes me a little sad to see that not everyone had that.** Sometimes you just want to go in there and "I'm already teaching for the entrance exam" or "I'm already a teacher at school" or "I just want to go to university to get my degree and be able to teach" and you just ignore some issues like this that are quite important, especially in our extremely sexist society, especially in the area of mathematics, which is the area of exact sciences in general. Even in my other course, economics. In economics I see more men, I don't know why, but it worries me a lot because I think..."well, **what kind of professionals is the university education producing? Professionals who actually care about these issues? Or at least have some kind of understanding?**" (Lueji, interview in 2021, emphasis added).

At this point, Lueji begins an exploration of her construction as a black woman and feminist, asking what kind of professionals the university is training. This question highlights her deep connection to the collective struggle, evidencing her perception of herself as a political body, as outlined by Butler (2018). Her concern reflects her preoccupation with the university as an entity immersed in the battles of the collective. As previously discussed, she, a political body, transcends conventional barriers by incorporating mathematics teaching with a collective approach, thus dismantling the naturalized paradigms that perpetuate social inequalities.

Later on, she talks about how she sees herself as a black teacher working in the field of mathematics:

The students **see in us examples of a possible path, right, the formation of mathematics, the formation of mathematics teachers, of women...**, but I confess **that I never saw myself in this place**, no, I never saw myself. In fact, **I see myself in this place from the perspective of the internship, I can see myself from the perspective of the little school that my boyfriend is part of**, what happens (...) it's a **Community**

**School, I see myself more in this place as well as other black teachers as well as other black female teachers.** (Lueji, interview granted in 2021, emphasis added).

Representation plays a significant role in her narrative when Lueji takes on the role of math teacher, but especially in contexts such as the junior school, a quilombo school. In this context, her presence takes on a relevance that, according to her own statements, is also felt by the black children. This presence is not only individual, but also collective, an incorporation of the "we", according to Butler (2018), something that Lueji is aware of sharing along with her subjectivity, which stems from her upbringing as a feminist woman.

Today, I don't see myself much as a black feminist. I'm somewhere between womanism and black feminism, I'm already changing things, you know? Changing themes, but not forgetting that **the basis of everything was that explosion of understanding with other women in a sexist, misogynistic, racist society and we thought about how to combat this** (Lueji, interview granted in 2021, emphasis added).

She is also in a dynamic process between black feminism and womanism. With regard to the latter, she follows the perspective of Carla Akotirene (2020), who rejects the label "feminist" and sees black feminism as an intellectual reinterpretation of white feminism. During the interview, Lueji briefly mentioned her readings of Aza Njeri. According to Aza Njeri, Kwame Ankh and Kulwa Mene (2020), despite Brazilian black feminism's focus on challenging sexism as a way to combat racism and break the invisibility of black women in the context of gender, the conditions of these women have been reevaluated within the black movement itself. One example is the inclusion of black women in spaces that whiteness does not expect, such as the university. But the empowerment of black women goes beyond the spaces of whiteness; it is also about valuing the roots of the quilombo family. Womanism emerges to articulate the shift from Eurocentric knowledge to an Afrocentric perspective. In this way, Lueji's vision of mathematics education takes on more meaning, which will be discussed below.

In discussing her own identity, Luma emphasizes her self-definition as a "transvestite woman". This choice of terminology is not only a personal aspect, but also a political move aimed at affirming not only her space, but also the space of other people like her. In doing so, she seeks not only a reaffirmation of identity, but also the visibility of the presence of transvestites in contexts that go beyond prostitution, as argued by Letícia Nascimento (2021). By adopting this self-designation, Luma actively contributes to broadening the understanding and representation of transvestite identities in different spheres of society and then reveals them:

So it's no wonder that **the job market is closed to us. So... even though I'm where I am, almost graduated in mathematics, I've never had an opportunity...** in fact, I've

**never had the courage to send my CV to a private school** today, here in Fortaleza, because I'm **pretty sure that a private school won't want a transvestite teacher on its teaching staff** because it would cause a huge stir in a school, perhaps, with **conservative parents** and that's why they go there on this issue. ... so... **I don't even have the courage to send in my CV because I would hardly be accepted, I'm very aware of this and I don't know if I'm really prepared to face all this other violence of being rejected, simply for being a transsexual person** (Luma, interview granted in 2021, emphasis added).

In this speech, the question of "which bodies are allowed to teach mathematics and in which spaces" is raised. Luma, who almost graduated from a public institution, faces the fear of being rejected when she sends her curriculum to private schools because of her trans identity. The trans body emerges as an agent of change in the school space (Luma de ANDRADE, 2015), but Luma perceives the resistance of private schools to transformation, which would probably also occur in public schools, but the stability of competition would probably make her more comfortable. Her identity confronts the professional sphere with discomfort, challenging social norms that oppress bodies considered subordinate. Luma denounces the state's abandonment and neglect of transvestites and transsexuals, illustrating how this context creates a "non-place". Despite this, transvestites continue to exist as political bodies, facing obstacles with resilience. Luma recognizes that private schools, anchored in cisnormativity (Viviane Vergueiro, 2016), are not willing to accept such a transformation.

Within the university environment, Luma has made a journey marked by struggle and political experience. She has actively immersed herself in the complexities of social and identity issues, contributing to the transformation of this space into a fertile ground for activism and awareness-raising. Her actions and participation have reverberated not only in her own trajectory, but also in the collective movement for justice. However, she speaks of a certain uncertainty during her course

**I have a lot of trouble with my own confidence in math. I remember one class that I had a lot of trouble with... Spatial Geometry. I was the only female there. There were nine other male students, one male teacher, and I was the only woman there at the time. Well then, with all the difficulties, sometimes I was afraid, I wanted to understand why I was the only one there...** (Luma, interview in 2021, emphasis added)

Luma transcends the recognition of her abilities in the daily struggle to be a dissident body, impregnated with political demands for inclusion and affirmation against cisgender norms (Jaqueline de JESUS, 2014). Her insecurities as the only woman in the class reflect the fears shared by many women in male-dominated contexts, a historical and cultural legacy of oppression and violence that continues to reverberate today. Luma finds herself at the

intersection of being a woman and a transvestite in a predominantly male environment, a complexity amplified by the state violence that affects her body (Judith Butler, 2018). In a male context and as a "transvestite woman," she faced insecurities about mathematics, but this did not stop her. Her journey is one of resilience and determination.

So far, we have proceeded with an analysis of singularities, which has allowed us to get to know our research collaborators better in their particularities. We will now reflect on two themes that emerged during the narrative interviews with the two women. We will call these themes axes of analysis, the first being "Good enough at mathematics to defend themselves" and the second "Mathematics as a masculine locus and feminist and pluralist teaching practices in mathematics".

Within the first axis, "Good enough at mathematics to defend themselves," Luma and Lueji's experiences of using mathematics as a means of self-defense against bullying are revealed. This approach leads us to a deep reflection, highlighting that mathematics is not only limited to the search for numerical solutions, but also plays an important human role, especially when we consider the school environment.

In this section, it is necessary to reflect on the nature of being considered "good at mathematics". This characterization is often associated with the perception of intelligence in different cultures and is recurrent in studies that explore stereotypes related to genius and ability, which are influenced by people's cultural particularities and delineate their positions in the mathematical context (Heather Mendick, 2005).

In this sense, for Lueji, his mathematical aptitude is highlighted during his school career, which has given him the image of someone who is skilled and perceptive. However, this image also has a negative side, as she perceived herself as being used by classmates who believed she could do all the work for them in assessments. It's important to note that Lueji was the only black student at a middle-class Catholic private school where she received a scholarship.

I don't remember my teachers differentiating me in any way, but I do remember some of my classmates (...) **I remember being seen in school as a person who was good at math and therefore intelligent**, not that the two things have anything to do with each other, but it's just that **people understand why you know math and take advantage of you because you're intelligent. I was used in the classroom, and then I don't know if it had to do with the fact that I was a woman or the fact that I was a black woman or both...**but I was used in the sense that **people thought I could do everything for them** and that I was going to save them in an exam or an assignment or a test (Lueji, interview granted in 2021, emphasis added).

Lueji noticed that being skilled in mathematics gave her status in the classroom and a dose of influence (Valerie Walkerdine, 2005). Although this ability gave her visibility and she was seen as "smart", she felt uncomfortable when she realized that others considered her useful and exploited her mathematical intelligence. This reveals a complex interaction between her position of power and the exploitation of her competence.

It was no different for Luma.

**In school I sold a lot of jobs, I really did... I was very capitalistic.** If they needed me, they would come and talk to me (laughs). I have a memory **of being caught fishing<sup>6</sup> for classmates. From then on, I did not take math tests with the class, I took them separately.** It was the same test, but separately, because I'm telling you, **I was selling schoolwork, and when they asked for help, there was no bullying.... There was no such thing....**(Luma, interview granted in 2021, emphasis added).

When threatened with bullying at school, Luma preferred to interact with students who involved her in conflicts, keeping her goals and determination as the backbone of her career. Her excellence in mathematics gave her a position of power, protecting her from these classmates who often sought her help, and she knew how to use this advantage to her advantage. Hygor Batista Guse and Agnaldo da Conceição Esquinca (2022) discuss how LGBTI+ math teachers, during their time at school, used math as a shield against attacks, and also as a bargaining chip, which ceased when the aggressors needed mathematical help. This dynamic, however, did not guarantee protection for everyone, highlighting how a lack of math skills could further marginalize dissident bodies in the face of LGBTI+phobic attacks.

Gender, race and sexuality permeate the bodies of Luma and Lueji, giving rise to actions, gestures and practices that confront the violence of bullying in the school environment, contributing to a process of social annihilation (Leticia Nascimento, 2021), demanding self-defense strategies from them. Mathematics, in this context, emerges as a form of survival, as evidenced by Lueji, who used it to mitigate episodes of bullying, while Luma saw it as an opportunity to obtain income and material advantage.

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<sup>6</sup> A local slang term that has the meaning of "cheating" in educational environments, it refers to the act of providing or receiving unauthorized help during a test or exam. It implies sharing answers or information unethically.

In the second axis of analysis, "Mathematics as a masculine locus and feminist and plural teaching practices in mathematics", we present the different conceptions of the collaborators, which reflect teaching approaches rooted in individual experiences. This shows how their perspectives and political stances influence their educational practices. Firstly, it is worth noting that the students in training recognize a male-inclined environment and highlight discrepancies in gender roles within the context of mathematics teaching, as Luma says below

**[...] the girls have to study humanities, the boys, who we can say, according to CIS, heteronormative standards, are the people capable of studying mathematics, studying exact sciences. In fact, this is already established and is often just passed on by the teachers themselves. So, yes, it's exclusionary, it's divisive... that's clear in any classroom. Girls feel less comfortable putting themselves forward, right, when it comes to math and when these subjects are exact. You can see that, can't you?** (Luma, interview in 2021, emphasis added).

class factors, as Luma shows. There is a clear tendency for gender labeling to be associated with math ability (Heather Mendick, 2005). According to her, this bias is transmitted by educators and results in various stereotypes that exclude female students from the math learning environment. This results in girls having to constantly prove their competence (Valerie Walkerdine, 2005; Maria Celeste Reis Souza & Maria Conceição Ferreira Reis Fonseca, 2010).

Reformulating approaches to training educators to deal with such situations is one of Luma's proposals for influencing teaching strategies. The introduction of gender discussions in the training of mathematics teachers is an approach that will contribute to the inclusion of students by focusing on the constructions of gender identities in the classroom, promoting more equitable teaching free of stereotypes (Maria Celeste Reis Souza & Maria Conceição Ferreira Reis Fonseca, 2010). Luma's perspective highlights the proximity of female mathematics teachers to the experiences of students, emphasizing the need to subvert an educational system based on a dominant culture (bell hooks, 2020; Maria Clara Araújo dos Passos, 2022).

Lueji also makes these points

Maybe **this has something to do with what I studied during my scientific initiation, like the fact that at the beginning of the modern school in the 16th and 17th centuries**, the teaching staff... you could call it that, but not really. **Most of them were women, you know, the women in the school, I see them catechizing the children**, which was the problem with them... so... anyway... **how to behave, maybe there are historical traces of this, you know, of women in the teaching profession.**

(...) **Mathematics is a very masculine field and that was one of the things that bothered me a lot** (*emphasis on the word*), **I felt uncomfortable**, but at the same time I see that there is a much greater presence of women in undergraduate courses, but then I wanted **to make that cut with a bachelor's degree in mathematics and a degree course to teach, to be a teacher** (Lueji, interview granted in 2021, emphasis added).

Lueji is uncomfortable, pointing out that there are more women in the bachelor's program than in the mathematics program at the same university, where men predominate. She harkens back to the past and mentions how women were encouraged to teach, associating it with the religious education of children. This reflects the historical link between teaching and traditional notions of femininity (Louro, 1997). Although she does not state this as an absolute fact, Lueji touches on discussions about the relationship between women, motherhood and teaching, as well as the feminization of this field in certain contexts (Patrícia Costa ATAIDE & Iran de Maria Leitão NUNES, 2016; Ana Paula Costa & Paulo Rennes Marçal Ribeiro, 2016; Carlos Augusto Gomes Cavalcante Silva, 2019; (Jarbas Dametto & Rosimar Serena Sirqueira Esquinsani, 2015), which may influence her perspective.

In the perspectives shared by Lueji and Luma, the male dominance in mathematics is clearly evident. Both voices highlight the marked gender inequality that permeates this educational scenario, offering a comprehensive view of the reality in which men still dominate.

Other points of great value in the narratives of the collaborators were the practices of teaching mathematics. Starting with Lueji

I see **African feminism more as a philosophy of life** than anything else. **If I'm going to bring it into the classroom, I can try to bring in black feminism. I don't really have to declare myself to do that, what I can try to say is that I am this way...** I am an **African womanist**. For example, **in the space where I'm not discussing this, but when I'm in the classroom, I can act as a feminist person, a person who is a black feminist, a womanist person.**

**I can make connections with women and math education. I can make connections with African womanism** because it's more of a philosophical question than anything else. For example, we went to study... **I don't remember if it was similarity of triangles and Thales' theorem...** I don't remember... **there's the biggest question of African historical heritage in relation to this, which is Egypt, right, with Africa, not only that, but recognizing mathematical knowledge that is also legitimate, born and developed in some way on the African continent.** To understand that **women are also important in this process of bringing this knowledge to the fore today**, that they were **also important in the process of developing this knowledge...** it's just a collection of things, because actually, **in my mind, one thing is connected to another.** (...) **understanding what the role of black women in mathematics has been throughout history is one of the things that I try to bring up and that I always put there as a reference so that I can bring it into the classroom, not just in the internship, but in short, bring it into places** (Lueji, interview granted in 2021, emphasis added).

Lueji brings an insightful perspective to mathematics, highlighting how lessons are steeped in the influences of European colonialism, which can alienate students from engaging with the subject. Her proposal is a lesson that recognizes the "mathematical knowledge that is also legitimately born and developed in some way on the African continent," exploring the connection of Thales' Theorem to Egypt and the role of black women in mathematics. The approach includes African history as a practice that goes against the conventional and seeks greater identification with blackness (Lélia Gonzalez, 2020).

Guided by African womanism, Lueji values Afrocentrism and the empowerment of black women, linking the future to black ancestors in order to save black lives oppressed by racism. This orientation is reflected in teaching practices that aim to empower black students. In the context of womanism, these teachers represent a mythical ancestral energy of solidarity that permeates the entire black community (Njeri, Ankh & Mene, 2005). In addition, Lueji addresses the importance of talking about black women in mathematics, promoting subjectivities and challenging dominant discourses that prevail in the classroom, thus stimulating deconstruction on the part of the students themselves (Julia Przybyla-Kuchek, 2021).

Luma also makes her proposal in the following speech



If you have a transvestite teacher, as I've already tried in a classroom, apply the mathematical content and leave... in fact, we live with people who are very young, people with a lot of curiosity... **when they come across diversity, with a transvestite teacher, so.... ... they would ask me questions that sometimes I knew how to answer and sometimes I didn't know how to answer... that wasn't in the context of mathematics, but it's important that we can relate this issue of gender to mathematics and we can do a lot because mathematics is very contextualized. Making those contexts and bringing those contexts to these gender issues is very important. If you use a mathematical problem there... where Maria works as an engineer and João works as a seamstress... you are somehow teaching these students something that is not very common... a woman engineer and a man seamstress... unless it's a gay man and if you can show that it would be much more interesting. Well, there is this issue of the school without a party, which tries in every way to put all these ideologies or anything that you try to relate, they end up confusing and criticizing this issue, but I think it's very calm, this issue of gender and mathematics is very important. We can do it very easily; we just have to want to. As I said, it's very difficult, this issue of ideological people, which they say exists, but is actually an ideology that they want to impose on places** (Lueji, interview granted in 2021, emphasis added).

She noticed that students were interested in their personal lives and in contexts beyond mathematics. In light of this, she recognizes the relevance of the gender connection to the content of the subject and highlights a valuable opportunity to address this perspective.

According to her, the problem does not arise as an ideology inherent to the classroom, but rather as an external ideology that manifests itself as oppression. By stating that "we can do this very easily, we just have to want to," Luma demonstrates her willingness to address gender issues related to mathematics in the classroom with an inclusive approach that values the identities of dissenting bodies and challenges the conventional cisgender order in the school environment. This approach is grounded in the pedagogy of disobedience as discussed by Tiffany Odara (2021).

Luma's approaches to teaching mathematics derive from her own experiences, and her knowledge is shaped by a pedagogical practice that is not universal, but rather guided by disruptive methods in opposition to the colonialist Eurocentric paradigms (Maria Clara Araújo dos PASSOS, 2022) that have historically shaped mathematics education. Her identity as a transvestite person is not overlooked by the dominant school and university norms, pushing for

a transformative approach to education that challenges and diversifies educational standards, allowing diverse bodies to achieve freedom in the learning process, i.e. the proposal to transvestitize education (Tiffany Odara, 2021).

Once again, we find narratives that go against conventional norms in the teaching of mathematics. Lueji's ideas are rarely found in other professionals who have not experienced this context, due to the rich ancestry that permeates this space (Carla Akotirene, 2020; Jaqueline de Jesus, 2018). Similarly, the political approaches identified by Luma stand out as protagonists and challengers in a scenario where power denies their existence. This clearly illustrates that mathematics does not remain inert and oblivious to social issues, but is shaped by the political bodies that enrich and transform it.

### **Final considerations**

Luma and Lueji, as plural bodies, faced oppression from both peers and teachers during their school years. They faced bullying situations and used mathematics as a means of defense and acceptance. However, it is remarkable that Luma was able to use this experience to her advantage. This leads us to reflect on how mathematics can be used as a tool of power and protection. This observation raises the question: do we, as mathematics teachers, consider these aspects? We learn from this passage that seeing mathematics only as a set of numbers, shapes, and formulas limits it in a certain way. A political stance and a sensitivity to providing a meaningful learning environment in mathematics are essential for mathematics educators.

In the words of our collaborators, there is an emerging awareness of the experience of confronting the masculinized space associated with mathematics. Although this reality is evolving, it is still largely dominant and justifies the relevance of discussing gender in the context of mathematics. Empowerment brings with it this relevance, even for those on the margins.

It is also important to recognize that all the discussions presented here, influenced by different subjectivities and experiences, shape teaching practices. This reminds us that mathematics is not silent and transcends imposed boundaries, occupying a space beyond its conventional definition and intertwined with the humanities.

Inspired by their subversive pedagogy, Luma and Lueji, as emerging mathematics educators, demonstrate that all identities can teach and dialogue with mathematics. By embracing these dissonant identities, they strengthen and broaden their critical perspectives, enriching the debates and humanizing the practice of teaching mathematics. The latter, which used to fit into a paradigm of neutrality, is now being profoundly transformed.

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