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“GET OUT OF MY COUNTRY!”: CONFRONTING RACISM AND XENOPHOBIA THROUGH INCLUSIVE MATHEMATICS EDUCATION

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Tese de doutorado apresentada ao Programa de Pós-Graduação em Educação Matemática do Instituto de Geociências e Ciências Exatas - Câmpus de Rio Claro, da Universidade Estadual Paulista (Unesp), como parte dos requisitos para obtenção do título de Doutor em Educação Matemática.

Orientador: Prof. Dr. Ole Skovsmose

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POTENTIAL IMPACT OF THIS RESEARCH

It is expected that this thesis will generate significant impacts on society by offering potential scientific, social, educational and cultural impact in an innovative way to the broad process of thinking about mathematics education for inclusion and social and racial justice in relation to immigrant communities, showing in research terms that remains scarce in Brazil, although the country is on the route of international migratory movements. In this sense, by bringing to light racialized social systems, this study contributes to uncovering and understanding racism in mathematics education. Therefore, the results of this investigation must be understood as part of the efforts that are intended to join the efforts of a community of scholars (from different areas) who together can contribute to a cumulative social impact. It is hoped that academic groups can, based on the results of this research, generate future solutions to the problems that humanity faces in relation to social injustices. This thesis has an impact on internationalization by addressing the ongoing conversation in the field about immigrant students and processes of racialization in mathematics education, in a field that has been, for the most part, dominated by Eurocentric and North American views of race relations. This thesis has an impact on sustainable development according to the concerns of the United Nations (2015), immigration, racism and social injustice are cross-cutting issues across the 2030 Agenda, relevant to the Sustainable Development Goals (SDGs). The impact is directed outside the academic universe, in the form of contributions to the social well-being and quality of life of individuals or groups of immigrants.

IMPACTO POTENCIAL DESTA PESQUISA

Espera-se que esta tese gere impactos significativos na sociedade ao oferecer potencial de impacto científico, social, educacional e cultural de forma inovadora ao amplo processo de pensar a educação matemática para a inclusão e a justiça social e racial em relação as comunidades imigrantes, se mostrando em temática de pesquisa que ainda permanece escasso no Brasil, embora o país esteja na rota dos movimentos migratórios internacionais. Nesse sentido, ao trazer à tona sistemas sociais racializados, este estudo contribui para desvendar e compreender o racismo na educação matemática. Assim, os resultados desta investigação devem ser entendidos como parte dos esforços que se pretendem unir aos esforços de uma comunidade de estudiosos (de diferentes áreas) que juntos possam contribuir para um impacto social cumulativo. Espera-se que os grupos acadêmicos possam, a partir dos resultados desta pesquisa, gerar soluções futuras para os problemas que a humanidade enfrenta em relação às injustiças sociais. Esta tese tem um impacto no sentido de internacionalização ao abordar a conversa em curso no campo sobre estudantes imigrantes e processos de racialização na educação matemática, num campo que tem sido, na sua maioria, dominado por visões eurocêntricas e norte-americanas das relações raciais. Esta tese tem um impacto no desenvolvimento sustentável de acordo com as preocupações das Nações Unidas (2015), a imigração, o racismo e a injustiça social são questões transversais na Agenda 2030, relevantes para os Objetivos de Desenvolvimento Sustentável (ODS). O impacto é direcionado para fora do universo acadêmico, na forma de contribuições para o bem-estar social e qualidade de vida de indivíduos ou grupos de imigrantes.

IMPACTO POTENCIAL DESTA PESQUISA

Se espera que esta tesis genere impactos significativos en la sociedad al ofrecer potencial de impacto científico, social, educativo y cultural de manera innovadora al amplio proceso de pensar la educación matemática para la inclusión y la justicia social y racial en relación con las comunidades inmigrantes, si mostrando en términos de investigación que sigue siendo escaso en Brasil, aunque el país esté en la ruta de los movimientos migratorios internacionales. En este sentido, al sacar a la luz sistemas sociales racializados, este estudio contribuye a descubrir y comprender el racismo en la educación matemática. Por lo tanto, los resultados de esta investigación deben entenderse como parte de los esfuerzos que se pretenden sumar los esfuerzos de una comunidad de académicos (de diferentes áreas) que en conjunto puedan contribuir a un impacto social acumulativo. Se espera que grupos académicos puedan, a partir de los resultados de esta investigación, generar soluciones futuras a los problemas que enfrenta la humanidad en relación a las injusticias sociales. Esta tesis tiene un impacto en la internacionalización al abordar la conversación en curso en el campo sobre los estudiantes inmigrantes y los procesos de racialización en la educación matemática, en un campo que ha estado, en su mayor parte, dominado por visiones eurocéntricas y norteamericanas de las relaciones raciales. Esta tesis tiene un impacto en el desarrollo sostenible según las preocupaciones de Naciones Unidas (2015), la inmigración, el racismo y la injusticia social son temas transversales en la Agenda 2030, relevantes para los Objetivos de Desarrollo Sostenible (ODS). El impacto se dirige fuera del universo académico, en forma de contribuciones al bienestar social y la calidad de vida de individuos o grupos de inmigrantes.

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I dedicate, with lots of love and affection, to my parents, Antônio and Rita, to my brother Raphael, and to myself for my resilience.

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The premier demand upon all education
is that Auschwitz not happen again.
Its priority before any other requirement is such
that I believe I need not and should not justify it.
I cannot understand why it has been
given so little concern until now.
[..]
Every debate about the ideals of education is
trivial and inconsequential compared to this
single ideal: never again Auschwitz.

Theodor Adorno

ABSTRACT

This research aims to discuss possibilities for inclusive mathematics education that combine the reality of immigrant students with reference to structural racism. Thus, it seeks to inquire about and analyse a social situation, understand the changes needed, and consider possibilities in mathematics education for engaging in social transformation toward overcoming many kinds of social borders and exploitation structures. The central question is: *what can inclusive mathematics education do in the context of international immigration shaped by social and racial structured injustices?* In this sense, the aim is to highlight the importance of mathematics education addressing issues such as racism, citizenship, globalisation, ghettoisation, and so on, and discuss how to expand the inclusive and anti-racism mathematics education field to go deeper in considering immigration issues, as well as outlining practical possibilities for mathematics classes, taking inspiration from already completed investigations, as well as imagined hypothetical situations. Using a qualitative approach, data was produced with fourteen participants who live in the state of São Paulo - in the context of the Covid 19 pandemic. The research participants were mathematics teachers from public schools, and immigrants from Venezuela and Haiti. The initial criterion for choosing the research participants was their willingness and ability to participate in the research remotely and engage in Portuguese conversation. Data was produced through interviews, which were recorded in audio and video. The data opened windows to studying the social scenarios in which the participants live, through which an in-depth theoretical discussion was possible. The accounts of the lived experiences of immigrants and mathematics teachers constituted elements of the social and educational framework. Such elements were crucial for discussions about possibilities for mathematics education. The results of this study show a context permeated by several mechanisms of exclusion and discrimination, reflecting the context of the mathematics classroom. These results point towards the need to rethink inclusive mathematics education in terms of immigrant students and anti-racism actions, so that it can be a powerful environment for students to get to know each other and the world, increasing their awareness of their place in the world and broadening from a local to a global perception. Five types of microexclusion were identified against immigrant students; they are *exoticisation, misleading identification, assimilation, second-class citizens*, and *misprising*. Stigmatisation and exclusion practices are presented in a gradient of subtlety and dissimulation, conducive to reinvigorating racism and xenophobia. Other research results are the projects: *The Beauty of Diversity, Global Mobility*, and *Ghettoisation—Is Racism a Factor?*. Such projects result from pedagogical imagination-stimulated creativity and offer an opening to thinking about the possibilities of overcoming borders in mathematics classes; they involve imagining the school, the classes, and the students.

Keywords: Immigration; Racism; Inclusion; Intersectionality; Critical Mathematics Education.

RESUMO

Esta pesquisa tem como objetivo discutir possibilidades de educação matemática inclusiva que contemplem a realidade dos estudantes imigrantes com referência ao racismo estrutural. Assim, procura investigar e analisar uma situação social, entender as mudanças necessárias e considerar possibilidades na educação matemática para engajar-se na transformação social e superar vários tipos de fronteiras sociais e estruturas de exploração. A pergunta central de pesquisa é: *o que a educação matemática inclusiva pode fazer no contexto da imigração internacional moldada por injustiças sociais e raciais estruturadas?* Nesse sentido, o objetivo é destacar a importância da educação matemática abordando questões como racismo, cidadania, globalização, guetorização etc., bem como delinear possibilidades práticas para as aulas de matemática, inspirando-se em investigações já realizadas, bem como em situações hipotéticas imaginadas. Utilizando uma abordagem qualitativa, foram produzidos dados com quatorze participantes residentes no estado de São Paulo - no contexto da pandemia de Covid 19. Os participantes da pesquisa foram professores de matemática de escolas públicas e imigrantes da Venezuela e do Haiti. O critério inicial para a escolha dos participantes da pesquisa foram a disponibilidade e condições de participar de uma pesquisa remotamente e habilidade em engajar em conversas em português. Os dados foram produzidos por meio de entrevistas, que foram gravadas em áudio e vídeo. Os dados abriram janelas para estudar os cenários sociais em que vivem os participantes, por meio das quais foi possível uma discussão teórica aprofundada. Os relatos das experiências vividas por imigrantes e professores de matemática constituíram elementos do quadro social e educativo. Tais elementos foram cruciais para as discussões sobre possibilidades para a educação matemática. Os resultados deste estudo mostram um contexto permeado por diversos mecanismos de exclusão e discriminação, refletindo o contexto da sala de aula de matemática. Estes resultados apontam para a necessidade de repensar a educação matemática inclusiva em termos de estudantes imigrantes e ações antirracismo, para que seja um ambiente em que os estudantes possam se conhecer e conhecer o mundo, aumentando a consciência do seu lugar no mundo, ampliando a percepção local e global. Cinco tipos de microexclusão foram identificados contra estudantes imigrantes: *exotização*, a *identificação enganosa*, a *assimilação*, os *cidadãos de segunda classe* e *despreso*. As práticas de estigmatização e exclusão apresentam-se num gradiente de subtileza e dissimulação, propícias a revigorar o racismo e a xenofobia. Outros resultados de pesquisa são os projetos: *A Beleza da Diversidade, Mobilidade Global* e *Getorização—O racismo é um fator?*. Tais projetos resultam da criatividade estimulada pela imaginação pedagógica e oferecem uma abertura para pensar sobre as possibilidades de superação de fronteiras nas aulas de matemática; envolvem imaginar a escola, as turmas e os estudantes.

Palavras-chave: Imigração; Racismo; Inclusão; Interseccionalidade; Educação Matemática Crítica.

RESUMEN

Esta investigación tiene como objetivo discutir las posibilidades de una educación matemática inclusiva que contemple la realidad de los estudiantes inmigrantes con referencia al racismo estructural. Por lo tanto, busca investigar y analizar una situación social, comprender los cambios necesarios y considerar las posibilidades en la educación matemática para participar en la transformación social y superar varios tipos de fronteras sociales y estructuras de explotación. La pregunta central de la investigación es: *¿qué puede hacer la educación matemática inclusiva en el contexto de la inmigración internacional moldeada por injusticias sociales y raciales estructuradas?* En este sentido, el objetivo es resaltar la importancia de la educación matemática abordando temas como el racismo, la ciudadanía, la globalización, la guetización, etc., así como delinear posibilidades prácticas para las clases de matemáticas, inspirándose en investigaciones ya realizadas, así como como situaciones hipotéticas imaginadas. Con un enfoque cualitativo, se produjeron datos con catorce participantes residentes en el estado de São Paulo, en el contexto de la pandemia de Covid 19. Los participantes de la investigación fueron profesores de matemáticas de escuelas públicas e inmigrantes de Venezuela y Haití. Los criterios iniciales para elegir a los participantes de la investigación fueron la disponibilidad y las condiciones para participar en una investigación de forma remota y la capacidad de entablar conversaciones en portugués. Los datos fueron producidos a través de entrevistas, que fueron grabadas en audio y video. Los datos abrieron ventanas para estudiar los escenarios sociales en que viven los participantes, a través de los cuales fue posible una discusión teórica profunda. Los relatos de experiencias vividas por inmigrantes y profesores de matemáticas constituyeron elementos del entramado social y educativo. Tales elementos fueron cruciales para las discusiones sobre las posibilidades de la educación matemática. Los resultados de este estudio muestran un contexto permeado por varios mecanismos de exclusión y discriminación, reflejando el contexto del aula de matemáticas. Estos resultados apuntan a la necesidad de repensar la educación matemática inclusiva en función del alumnado inmigrante y de las acciones contra el racismo, para que sea un entorno en el que los alumnos puedan conocerse y conocer el mundo, aumentando la conciencia de su lugar. en el mundo, ampliando su percepción local y global. Se han identificado cinco tipos de microexclusión contra los estudiantes inmigrantes: *exotización*, *identificación errónea*, *asimilación*, *ciudadanía de segunda clase* y *desprecio*. Las prácticas de estigmatización y exclusión se presentan en un gradiente de sutileza y disimulo, propicio para revigorizar el racismo y la xenofobia. Otros resultados de la investigación son los proyectos: *La belleza de la diversidad*, *Movilidad global* y *Guetización: ¿es el racismo un factor?*. Tales proyectos resultan de la creatividad estimulada por la imaginación pedagógica y ofrecen una oportunidad para pensar sobre las posibilidades de superación de fronteras en las clases de matemáticas; supone imaginar la escuela, las clases y los alumnos.

Palabras Clave: Inmigración; Racismo; Inclusión; Interseccionalidad; Educación Matemática Crítica

LIST OF FIGURES

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SECTION A – MOTIVATIONS AND THEORETICAL FRAMEWORK

This section is presented in a traditional chapter format. In this section, four chapters will be presented that address the main theoretical references, related to the triad of discussion in this dissertation: international immigration, racism/xenophobia, and inclusive mathematics education. These references will be used throughout the work and will appear again in later sections, mainly in the analysis papers. The theoretical assumptions of the research will also be presented, as well as the motivations, questions, and objectives of the research. The aim is to present the contents that guided the choices made for this investigation. At the end of this section, the references that supported these four initial chapters are presented. These references are also listed along with the others at the end of the dissertation. In several moments of the thesis, I make references to excerpts from songs. Next to each excerpt there is the link like this  where the reader can click and access to listen to the songs while enjoying the reading and adapting to the context of the discussions. Enjoy it!

1 INITIAL CONSIDERATIONS

They say war is a state of illusion
Just made up to remind us we're free
They didn't really gas those children in Syria
No, it was only a thing for TV
Have you not heard the war is over
The word borders are man-made invention
Mother Nature would not make those things
She makes beautiful mountains and rivers
Things that can't be dreamed up by a King
Have you not heard the war is over
[...]
Have you not heard the war is over
They fund this new thing called peace
It turns out there was really no difference
No difference at all between you and me
(Declan O'Rourke)[1]

The excerpt above is from the song *Have you not heard the war is over (*  *)*, written by Declan O'Rourke, a singer-songwriter from Ireland. By writing about a kind of brainwashing that makes people numb to the reality of tragedy and suffering, he expresses his protestation of the war, which resonates throughout this excerpt and the entire song. This song also expresses my own objections and concerns about such people's numbness when confronting situations of injustice and cruelty in society.

I must have been about ten years old when I first realised I was living in a global reality where war still rages. Until then, for me, war took place in cartoons, in the movies, in games with my brother's tin soldiers, or in books about legends and folklore. To speak of war was to speak of something from the past, or from a distant place. But it was at school that I learned that wars were real and happening at that moment in history.

It was very harsh to realise that for many children the truth about wars comes even earlier and more concretely, as they experience it in their own realities. I heard about Jewish Holocaust survivors, and that this tragic moment in human history was more recent than I could comprehend. Even so, I spent many years imagining that wars and destruction were things on TV news that happened in other countries, in a reality so far away that the dimension and gravity dazzled me.

[1] https://www.youtube.com/watch?v=sMk_XTYN1q0&ab_channel=declanorourkechannel

Therefore, I realised that my own country, Brazil, also had its own history affected by tragic events: that the enslavement of people was a recent historical event, and that war could happen in many other ways in the daily lives of many people. I realised that cruel situations were not stories from books, whether these were books about the past or about someone else's reality.

Much later, as a student at university, I would come to understand that what can be said about war can also be said about education, regarding its relationship with diversity and positions of the oppressed and the oppressor, as well as the *We-Other* paradigm. Then, I could comprehend that mathematics could not and should not be a dry and inert field in the face of such reality. It could be possible to think about the reality and the possibilities of transformations through mathematics.

Moreover, mathematics becomes a resource for both wonders and horrors once it becomes a part of technological, military, economic, and political structures (D'Ambrosio, 1994). Globalisation and the borders of the world have to do with advances in mathematics. The *formatting power of mathematics*[2] means that social phenomena are structured and eventually constituted by mathematics (Skovsmose, 2014). According to Skovsmose (2023), mathematics is indefinite and plays different and contradictory roles:

> Since the Second World War a principal new development has taken place: mathematics has come to play a crucial role, not only in the design and construction of war technology, but also in the very functioning of this technology. We can observe the firing of a missile and also the explosion when it reaches its target, but we do not see all the mathematical algorithms that form part of the steering of the missile and the timing of the explosion. Mathematical algorithms are brought into operation everywhere in modern war technology (Skovsmose, 2023, p. 230).

This research is developed by seeking understanding of social and educational contexts, which can lead to reflections and possibilities for social transformations and the uses that society can make of mathematics. It is about imagined opportunities for students to reflect on what mathematics might be doing in terms of wonders and horrors. It is, therefore, research on possibilities based on the idea that, as global citizens, we are no longer called to just interpret the world; it is also important to propose possibilities to change the world and to change it in ways that resist injustice, all of this sustained in the unifying perspective of the planet and of a world society.

[2] See more about *formatting power of mathematics* in Skovsmose (1994).

The dichotomy of wonder-horror requires critical thinking. Paulo Freire (2000) used formulations for emphasising the necessity of education for reading the world and challenging us to humanise the world. Thus, these insights demand that we humanise the world through mathematics, and this has to do with considering diversity inside and outside of school, keeping in mind that "the oppressed must not, in seeking to regain their humanity (which is a way to create it), become in turn oppressors of the oppressors, but rather restorers of the humanity of both" (p.44).

Furthermore, this research is about educating immigrant and non-immigrant students to live with differences, and understanding how differences can influence motives for learning mathematics and impact contexts outside school on the basis of social transformation. Building respect for differences, supported by communication and tolerance, is fundamental in the paradoxes referring to inclusion and exclusion, oppression and exploitation, hope, and solidarity.

The purpose of this introductory chapter is to explore the concerns and questions that motivated the development of this research. The intention is to guide the reader to perceive the reasons and movements towards social transformation through mathematics that have been present since the planning of this research. I will also discuss the reasons for deciding to pay attention to the specificities that involve being an immigrant student in mathematics classes.

In the following section, I explain my personal motivations for undertaking this research. I also talk about how the research planning took place and how critical mathematics education presents itself as a theoretical foundation for the fundamental concerns of the research.

1.1 Researcher background and foreground

Research in mathematics education must be committed to society. Reflections must be of public order and at the service of humanity. In this sense, this doctoral dissertation is about the intertwining of the researcher's questions about the world in the search to understand power structures and how they act under the engagement of transformation.

The exercise of research is, therefore, an exercise of understanding the world of the researcher. Before unveiling the research object, it is necessary to understand oneself as a scientist, unveiling and understanding the context in which one is inserted. For, "[...] a scientific practice that forgets to question oneself does not know, properly saying, what one does"

(Bourdieu, 2002, p.35)[3]. Therefore, my background[4] and foreground as a researcher underpin the existence and paths of this research, and present themselves in the data production process.

First of all, I describe myself as a black[5] woman from Brazil who, from a very young age, had experienced both realities in society: those situations of vulnerability, as well as those spaces of privilege and power. I grew up in a family context with certain economic and social disadvantages. I eventually experienced vulnerable living conditions and witnessed precarious living conditions surrounding other families in a poor neighbourhood. However, with the purpose of social ascension, my parents managed to send me to private school, and I accessed the privileged realities in the school setting and also in my peers' contexts.

Experiencing such different social circumstances led me to become aware of a massive socially inequal[6] state of things. In such a state of things, on the one hand, I could observe people's scarcity, fears, doubts, and, often, indignation in living in the daily struggle to obtain the minimum of survival. On the other hand, I could notice people living in comfortable situations of abundance anchored in individualism and indifference, occasionally sustained in the lack of knowledge of other one's realities.

Such a situation of inequality is driven by the race to escape poverty, along with ideologies of achieving and maintaining positions of privilege. Whoever fails in this race could be an object of mockery. I could notice some determinations of speeches under meritocracy bias. My classmates in the private school, for example, mocked poor neighbourhoods in the city, referring to them as places of little importance, alluding with disdain to places they had probably never been to. I was familiar with the realities of such places and could not understand why they would make jokes about such realities.

During my life trajectory, I also went through racism. I could tell that the realities I was experiencing had different shades of colour, literally. On the one hand, there were a lot of white people, and on the other hand, there were a lot of non-white people. In certain places, I was one of a few black people. In other places, I blended in with the crowd. In spaces of privilege and power, many people mistook me for a cleaning lady, a store employee, or simply pointed at me

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[3] Translated from: [...] uma prática científica que se esquece de se pôr a si mesma em causa não sabe, propriamente falando, o que faz (Bourdieu, 2002, p.35).

[4] See more about background in D'Ambrosio (1990).

[5] I refer to terms "black" and "white" as social groups, not genetically distinct branches of humankind or strictly referring to the colour of skin. See more about race as social construction in Chapter 2.

[6] According to the platform Gini index (World Bank estimate), Brazil is on the list of the ten countries with the Highest Wealth Inequality in the world. Someone earning the minimum monthly wage would have to work 19 years to make the same money as a Brazilian from the richest 0.1% of the population makes in one month. See more in:
https://worldpopulationreview.com/country-rankings/wealth-inequality-by-country
and https://www.oxfam.org/en/brazil-extreme-inequality-numbers

with debauchery or looked at me with contempt. My brother, for example, had the experience of being the only one, in his group of friends, to be patted down during a police inspection. Not surprisingly, he was the only black person in this group.

Although I grew up in the security of a free country, my ancestral roots intertwine in politically and historically unstable soil where indigenous and black peoples faced violence and still face structural racism which manifests sometimes implicitly, sometimes explicitly. And the reasons were not always apparent and understandable to me. But I will never forget how concerned my mother was about my brother and I always being kept very clean and well-groomed. I could not understand her reasons, at that time, but now I see that we did not have the white privilege of dressing however we wanted, or we risked being underestimated or disrespected.

Another noteworthy aspect of my background that contributed to the motivations of this research was the experience of visiting European countries and witnessing some of my friends' reality of being an international immigrant. I could experience various stereotypical situations imposed on people from Brazil and from other countries, reflected in existing hierarchical relationships between people of different nationalities. For instance, I was able to experience stereotyped approaches that were often reflected in the eroticisation imposed on black and Brazilian women.

Through my experiences in Europe, I was able to witness situations of vulnerability faced by immigrant people as they sought opportunities and better living conditions in other countries, struggling with precarious life conditions. I will never forget the occasion I visited friend in a house in London with many immigrants from South America. All rooms in the house were set up as bedrooms, divided (sometimes) by curtains. Some of them slept on mattresses on the floor, while others slept in hammocks. I became conscious of the fact that, for many immigrants, a better quality of life was far away. And most of them were not even able to grasp their situation of injustice and vulnerability.

All those situations in my personal life, as well as the experiences in my professional life as a mathematics teacher (which will be discussed in the next topic) are part of my background and foreground that pervades all this doctoral dissertation. Concerning my background, I refer to what I have done and experienced in a socio-political and cultural context; while concerning my foreground, I refer to my dispositions for action, aspirations for transformation, and possibilities in life. Together, my background and foreground have been socially structured and related to the motives for the conduction of this research.

The familiarity with inequality, injustice, immigration, racism, and mathematics education placed me in a favourable position for the exercise of seeing beyond. It put me in a position of hope and optimistic imagination in the face of possibilities through mathematics education.

1.2 About concerns

Throughout my walk in the academic environment, I discovered a space of freedom and the possibility of having my own voice heard. I discovered a world of options through mathematics for reflecting and discussing world alternatives and transformations. The need to walk along different paths than other researchers in mathematics, who positioned themselves as aloof and omitted mentions of social complexity, had guided my choices since graduation, when I chose the degree in mathematics.

Also, throughout my journey as a mathematics teacher, I was experiencing the differences of students in class, whether due to cognitive abilities, economic conditions, or nationality, among other things. This set me in movement towards exploring what concerns about mathematics classes could mean in a position of awareness of diversity inside and outside the school.

Later on, during my Master's degree research (Carrijo, 2014)[7], the topic of citizenship from the perspective of critical mathematics education made sense to me. I could discuss the importance of moving beyond the generic use of the word citizenship in educational discussions, and foster reflections on education for citizenship through mathematics education.

According to Skovsmose (2011; 2014; 2020-b), critical mathematics education is not a methodology, nor a way of doing things; it is not based on fixed theories, nor on particular political positions. Critical mathematics education can be characterised in terms of concerns: to challenge social exclusion, exploitation, systemic poverty, racism, sexism; to fight for social justice; to bring new possibilities and expectations for students and for all situations in which mathematics can be critically required. According to Skovsmose 2023:

> For elaborating a critique of mathematics, it is important to confront any automatic glorification of mathematics and to challenge the doctrine that mathematics is harmless and innocent […] Mathematics is not an absolute monolithic structure; it is a human construction that, like any other human construction, can be reformed, remoulded, and reconstructed. Mathematics is a multitude of constructions that can serve a multitude of interests. This makes a critique of mathematics not only possible, but also necessary (p.149).

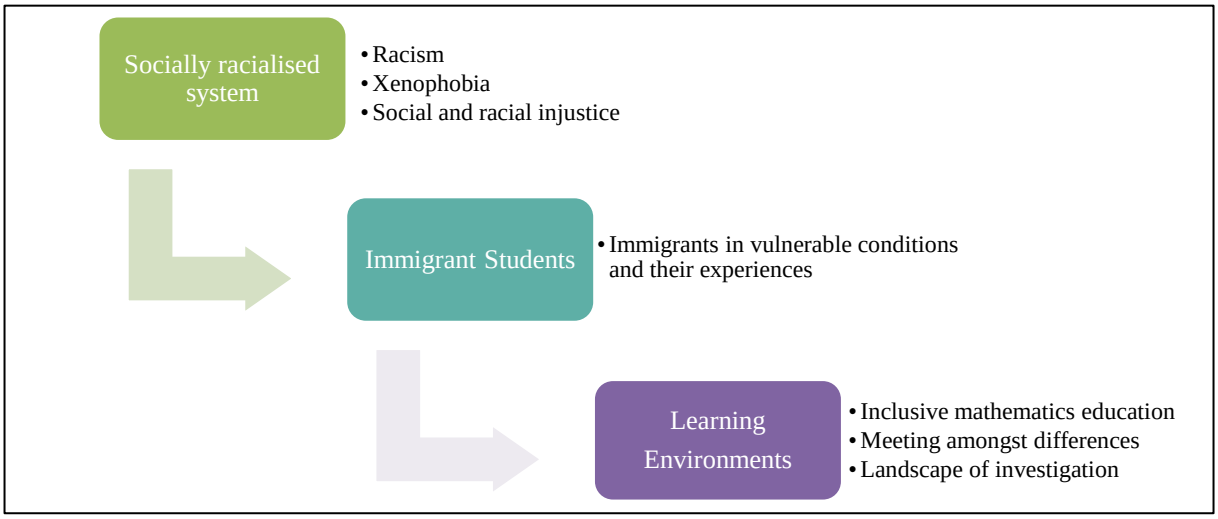
[7] Carrijo, M. Formação para a cidadania: análise de pesquisas na perspectiva da Educação Matemática Crítica. Master's thesis. Universidade Federal de Goiás, Goiânia/GO. 2014.

Critical mathematics education and its concerns became an essential theoretical framework to help me reflect on and understand how mathematics education can provide learning possibilities for all students. Moreover, I could interpret that mathematics is related to the outlines and format of society; it is critical to develop mathematics education as part of a democratic endeavour. I was able to regard as important opportunities to increase the visibility of sexism, heterosexism, racism, and classism—typically redefined through mathematics—and encourage students to doubt, explore, uncover, perceive alternatives, and, most importantly, acquire new viewpoints and attitudes (Bright, 2016).

For Skovsmose (2000), motives and dispositions for learning mathematics can have very different formats and be affected by many issues. Learning mathematics opportunities, as well as learning mathematics obstacles/barriers, can be manifested and experienced in different ways by the students. Thus, I find it is important to discuss learning opportunities and obstacles with reference to immigrant students. The way they engage in learning processes can be related to their possibilities in life, and those possibilities can be intertwined with a structured system of racism.

Critical mathematics education expresses concern mainly related to society, students and learning environments. Accordingly, this doctoral study is organised through three themes of concern, as illustrated in Figure 1 below:

Figure 1: Research Concerns



Fonte: Produced by the author.

Considering those concerns, the general objective of this research is: *to discuss possibilities for inclusive mathematics education that combines the reality of immigrant*

students with reference to structural racism. In the next section, concerns with immigrant students will be further discussed.

1.3 Concerns about immigrant students

Immigration as a research topic seems to have gradually been surfacing in my thoughts well before its definitive and clear appearance for the research project. Apart from the fact that immigration is part of some of my life experience, I am inspired to learn more about the complex social system that makes people change countries. Personal motives, courage, fears, desires, learning, challenges... immigrant people leave an established life to rebuild it elsewhere, often with poorly defined ideas about what they may find in the future. This led me to study more about global conjuncture, read literary reports, and follow the news about immigrants that frequently appears in Brazil and the rest of the world. But why do immigrant students matter for this research?

Conflicts and debates about international immigration have been intensifying in different regions of the world, particularly in the face of recent events that have led thousands of people to move in search of other places to live. Conflicts in Venezuela, Syria, Afghanistan, South Sudan, and Ukraine, for example, have increased these displacements, which are accompanied by one of the worst humanitarian crises of our time, since they result in a contingent of people in situations of vulnerability.

Today, there are more immigrant people in the world than ever before, and this process may continue in the coming years. Almost every country on the planet is affected and will continue to be affected by the immigration phenomena. Several global challenges are tightly linked to immigration. Immigrant people have their own set of challenges and many of them face vulnerable situations and have their human rights violated. Immigration has significant social, economic, and political effects both locally and internationally.

Educational systems are also affected by such international context settings, which is a concern for mathematics education and for this research. Indeed, the meeting of students with different background and foreground in mathematics classrooms is a prolific moment for thinking carefully about pedagogical practices through other settings and arrangements. The emergence of immigrants in schools triggers several questions and uncertainties. This research is set in the framework of the rise and complexity of international migrations in the midst of tensions related to inclusion in unequal and discriminatory societies.

According to Skovsmose (2014), mathematics is a discourse that can limit people's chances in life as well as their participation in certain spaces, a discourse which can perpetuate

inequalities and oppression, suppressing students' capacities. However, through building educational possibilities, people can go beyond the limitations which a socio-political possibility has imposed on a group of people. In such a way, mathematics can be used to foster the students' capacities, considering whatever group of students we have in mind. This can be done when the mathematical data presented support critical discourses to understand what is beyond the results. This movement is necessary to break away from excluding paradigms in mathematics and encourage students to do mathematics.

Research points out that the discussion on migration and education, as well as the specificities of teaching for these populations, is still scarce in the main indexed bases in Brazil, although the country is on the route of international migratory movements/flows (Silva; Braga, 2019). Despite the pervasive reality of racism, few studies addressing these issues within the mathematics classroom have been conducted in Latin America (Valoyes-Chávez, 2018). Little work has been done in the field to examine how racialisation shapes the mathematics experiences of immigrant students within the context of global mobility, as well as its consequences for their full social inclusion (Luz Valoyes-Chávez; Alex Montecino; Paloma Guzmán, 2021).

> To unpack these issues, researchers interested in the mathematics education of immigrants must look beyond issues of language and numeracy to focus on the mechanisms, practices and discourses that dehumanise these student populations and condemn them to social and educational marginalization (Luz Valoyes-Chávez; Alex Montecino; Paloma Guzmán, 2021, p.12).

1.4 Dissertation organisation

This dissertation is multi-paper-based and organised in four sections. Section A is about motivations and theoretical framework, and it is divided into four chapters. In Chapter 1, the research motivations and some concerns that emerged within critical mathematics education relevant to the development and planning of the research are presented.

In Chapter 2, the social conjuncture on which this doctoral dissertation is based is discussed in term of a racialised social system, and racial democracy in Brazil is contested. In Chapter 3, the aspects of immigrants' contexts are discussed in terms of social borders and vulnerability situation. Chapter 4 discusses the ways in which learning environments interact with immigration and diversity, mediating them with the ideas and assumptions of inclusive mathematics education.

Section B is divided into two chapters. In Chapter 5, the methodology and methods of data production and analysis are presented, while Chapter 6 presents the researched social scenario and the data/windows produced under the focus on cooperative participants:

immigrants and teachers. This study was developed in the context of São Paulo and during the years 2020 and 2021, it was strongly affected by the context of Covid 19[8] pandemic. In this period, theoretical studies and the whole process of data production had to follow strict measures of social distancing to avoid the rapid escalation of the number of infected people. Therefore, this research had to deal with obstructions at the time of data production and changes were necessary to carry out the study, adapting to the new conditions imposed by the pandemic.

Section C is composed of four analysis papers. In the paper *Mathematics Education for Social Justice: Reflections on Racism and Immigration*, racism and stigmatisation in the mathematics education context are discussed. An imagined hypothetical example for classrooms (in the form of the project *The Beauty of Diversity*) is explored as a possibility to create space for discussing controversial issues in mathematics classes. The paper *Mathematics Education for Citizenship: Immigrant Students as a Viewpoint* presents a conceptual investigation of mathematics education for global citizenship, focusing on the reality of immigrant students towards an understanding of global community and with reference to structural racism. The paper *Microexclusion and Immigrant Students* discusses social borders and inclusion of immigrant students versus oppressive social structures and microexclusions. In the paper *Globalisation and Ghettoisation: About Meetings Amongst Differences in Mathematics Classes*, globalisation and ghettoisation are discussed as concepts related to mathematics education and immigrant students, and a project is addressed as a possibility to consider the reality of immigrant students and consolidate meeting spaces to overcome the distances created by ghettoisation.

Section D presents the final considerations of this study in terms of connections to the main discussions made in the previous chapters, and highlights possible contributions of the research, as well as the limits and the need for further studies.

[8] In 2020, the World Health Organization (WHO) declared Covid 19 to be a highly transmissible infectious disease that had spread throughout the world. In an attempt to curb the disorderly growth of contagion and the number of deaths, hygiene protocols and the quarantine decree were imposed, leading to the suspension of activities in schools, churches and commerce, as well as any face-to-face group activities.

2 RACISM FOSTERING XENOPHOBIA


And there are people who lean the flag
To cover such infamy and cowardice
And let it change at this feast
Into an impure mantle of a cold bacchante
My God! My God! But which flag is this,
That imprudent on the topsail sways?
Silence. Muse…cry, and cry so much
That the flag be washed with your tears
Antonio Castro Alves[9]

As presented in the Introduction chapter, critical mathematics education expresses concern mainly related to: society, students and learning environments. In this chapter, I will illustrate the social conjuncture on which this doctoral dissertation is based – the background and lived experiences of my research participants. Discussions about students (including immigrant students) and an exploration of learning environments mediated by the assumptions of Inclusive Mathematics Education will be made in Chapters 3 and 4, respectively, based on analysis of this social context.

I understand that researching mathematics education with immigrant students who are racialised in Brazil comprises intensely intersectional processes. Moore (2021) addresses how further research efforts on queer identity in mathematics education have been made possible using intersectional (and innovative) lenses for understanding students' and teachers' experiences. Likewise, mathematics education may employ an essentially intersectional approach to reflect the ways that immigrants—as defined by racial powers—are differentiated along other dimensions.

Collins (2015) states that: "race, class, gender, sexuality, ethnicity, nation, ability, and age operate not as unitary, mutually exclusive entities, but rather as reciprocally constructing phenomena" (p. 41). In this sense, theories of intersectionality emphasise the interrelatedness of different axes of oppression, and how they are mutually constitutive.

The nature of intersectionality is not based on specific social labels but rather on the process of revealing and unpacking the complexity of power relations, inequities, and forms of social oppression among immigrants—and how they collide and control elements of their experiences. Immigrants are exposed to multiple forms of injustice rooted in their simultaneous

[9] Translated from? "E existe um povo que a bandeira empresta/ Pra cobrir tanta infâmia e cobardia E deixa transformar-se nessa festa/ Em manto impuro de bacante fria/ Meu Deus! Meu Deus! Mas que bandeira é esta/ Que impudente na gávea tripudia? / Silêncio, musa, chora, chora tanto/ Que o pavilhão se lave no teu pranto".

engagement with multiple power relations that exclude and silence the most marginalised (Akotirene, 2019; Stasiulis; Zaheera; Rutherford, 2020; Tummala-Narra, 2020; Devulsky, 2021; Moore, 2021).

In this chapter, I consider the intersectionality that runs through xenophobia, racism, and immigration[10]. Using these lenses may help us to go some distance in understanding why some mobile humans are placed in more or less deserving categories than others. It means realising that exploitation takes place simultaneously on the level of race, nationality, and cultural differences. Moreover, each group of immigrant people might be subjected to racism and xenophobia in different ways.

It is crucial to keep in mind the global social attribute of being heavily scarred and submerged in a racialised system of organisation. One might think that manifestations of racially based prejudice could be understood as a trivial remnant of—or sequel to—a past mentality of human rights suppression. However, despite the decline of institutionalised modes of racism—such as the abolition of slavery and the decolonisation of the countries in the south—racism has been reinvented. It has manifested in other various ways. The end of Apartheid in South Africa and racial segregation in the United States of America (USA) did not mean overcoming issues related to racism. According to Delgado and Stefancic (2017),

> Many modern-day readers believe that racism is declining or that class today is more important than race. And it is certainly true that lynching and other shocking expressions of racism are less frequent than in the past. Moreover, many Euro-Americans consider themselves to have black, Latino, or Asian friends. Many enjoy watching black or Latino entertainers and sports figures and listening to rap music. Still, by every social indicator, racism continues to blight the lives of people of color, including holders of high-echelon jobs, even judges. Police-community encounters are daily reminders that this continues to happen (p. 22).

Indeed, forty years after the defeat of Nazism and twenty years after the massive wave of decolonisation, how is it possible that racism is still a growing global phenomenon?

In Brazil, racism kills, despite a large portion of the population insisting that it barely exists any longer. According to the 2019 Atlas of Violence[11], 78% of those killed by firearms are black[12]. There is a deepening racial inequality in lethal violence perpetrated by the police. For instance, fourteen-year-old João Pedro was brutally killed in 2020 when the house he was in (along with five other children) in Rio de Janeiro was invaded by police officers as part of

[10] In Chapter 3, I discuss intersectionality related to racism, immigration, inclusion, and mathematics education.
[11] See more in: https://www.ipea.gov.br/atlasviolencia/download/24/atlas-da-violencia-2020.
[12] Sum of black and *pardo* people, according to Instituto Brasileiro de Geografia e Estatística (IBGE).

an operation against drug traffickers in the area[13]. Another example is Luana Barbosa, a Brazilian, black, lesbian woman who died in 2016, at the age of 34, due to police violence in São Paulo[14]. These are some examples of situations where the victims did not represent the imminent threat of death or serious injury required to justify the force used, illustrating a public security policy aimed at the repression and extermination of black people (Ribeiro, 2019).

Such examples represent violence through systematic racism and the behaviour of the police. However, other situations are observed in other spheres of the Brazilian social structure, such as in health systems, in relationships between people, in the spatial organisation of the cities, and in educational systems.

Social contexts are constantly changing, and these transformations also change the ways in which racism manifests, which can affect different people and target different realities. Depending on the social, historical, and political environment, racism has various effects on immigrant people's lives in many cultures in Brazil and worldwide. Immigrants may be excluded from the society in which they live and may also face hostility and violence from racists or extremist groups.

Racism fosters xenophobia. It can manifest itself in xenophobic thoughts and actions. Nevertheless, how is that possible? How can immigrant people be affected by racism? Reflecting on this question is essential to give thought to possibilities for mathematics education which aims to improve the inclusion of immigrant students.

This chapter aims to provoke reflections on the social context in which this research is organised. It seeks to understand some of the dynamics of the construction of Brazilian society and its relationships, and to open up a horizon for reflections on inclusive mathematics education in a context permeated by international immigration. In order to so, it raises debate about a power structure that grants racial privilege to a particular group of people and increases racial vulnerability and social injustice in the face of the dichotomy of inclusion and exclusion based on racism.

In the first section, I address the debate about the social construction of race and racism to present my understanding of a racialised society. The following section, racism in Brazil, is discussed in terms of pigmentocracy. Finally, the racist foundations of xenophobia in relation to nationalism will be discussed, with a particular focus on the Brazilian context.

[13] See more in: https://www.theguardian.com/world/2020/jun/03/brazil-black-lives-police-teenager
[14] See more in: https://g1.globo.com/sp/ribeirao-preto-franca/noticia/2016/05/conselho-ve-abuso-de-poder-da-pm-na-morte-de-luana-por-espancamento.html

2.1 Social construction of race and racism

From a biological point of view, race is an inoperative concept. Hypothetically, I wonder if one could split people into racial categories based on any biological attributes: the size of their ears, sickle cell anaemia genes, diabetic genes, and so on. People from races with large ears could be categorised as " civilised", whereas individuals from races with small ears could be categorised as "savages". One might consider the genetic characteristic related to average height, where Mozambican people would be in the same group as Peruvian people, and Jamaican and Taiwanese people could be categorised as the same[15].

I also wonder if it could create a set of assumptions that could lead people to saying racist things like: “people from the race with big ears stink”, or “people with anaemia or diabetes are sick because they do not believe in God”. Also, it could be possible to say: “he is tall, but he is honest”, or: “you are so clever for someone with green eyes”.

When the lens used to define races is changed, the non-functionality of this notion becomes even more evident. We notice that it is not only skin colour that could be used for splitting humankind in groups—other elements could be used as racial categories, since people are classified as race A or B not because they *are* race A or B, but because race A and B are established as races to denote racial distinctions in society[16]. In creating the notion of race, it became possible to dehumanise certain groups of people based on visible “evidence”. This also caused eugenics[17] and social-Darwinism theories to flourish, and paved the way for racialism through structured hierarchisation (Bonilla-Silva, 1997; 2015).

Although the concept of race[18] is no longer regarded as a biological category in the way it once was—since science has developed—it is still significant as a social construct, with genuine implications for one's chances in life. Race no longer requires its biologising meaning to ensure its continued existence. It is socially meaningful, and it is used in societies such as Brazil as a marker of difference and social worth, which reproduce ethnoracial hierarchies and inequalities (Munanga, 2004; Kirkland, 2021). According to Guimarães (1999):

> It is precisely from there that the need to theorize "races" appears as what they are, that is, social constructs, forms of identity based on an erroneous

[15] See more about body heights statistics in: https://ourworldindata.org/human-height

[16] The differences between an African black person and a European white person are caused by a mere 0.001% of the human genome, which means all human beings are 99.9 percent identical in their genetic makeup. See more in https://www.genome.gov/about-genomics/fact-sheets/Genetics-vs-Genomics

[17] The field of eugenics attempts to better the quality of the human race through means such as sterilisation, selective breeding, or mass extermination (Delgado; Stefancic, 2017).

[18] The categorisation of living things began in botany and zoology. Later on, taxonomy was also extended to humans. The colour of one's skin, the shape of one's mouth, nose, head, and eyes were all considered when dividing the human species into races. According to Carolus Linnaeus’ (1758) biased viewpoint, each race's classification relates intellectual and emotional attributes to physical characteristics.

> biological idea, but socially effective, to build, maintain and reproduce differences and privileges. If races do not exist in a strictly realistic sense of science, that is, if they are not a fact of the physical world, they are nevertheless fully existent in the social world, products of ways of classifying and identifying that guide the actions of human beings (p.153)[19].

According to Telles (2014):

> Human relations in Latin America often involve relationships among persons of various phenotypes and cultures. Unfortunately, these relationships often involve power differentials (racism), in which humans are classified according to characteristics such as color, culture, or language, which are ranked on a hierarchy of worth (racialization). In the Americas, these characteristics are often denoted by categories that are popularly known as "races" (or, more politely, ethnic groups) (p. 29).

Race exists in social terms, and sustains and affects an entire *racialised social system* (Bonilla-Silva, 1997; 2015). In a systematic way, such social organisations are guided by white supremacy, in which whiteness has value for its holders and involves plenty of privileges and benefits that come with being a member of the dominant race. According to Bonilla-Silva (1997):

> races typically are identified by their phenotype, but […] the selection of certain human traits to designate a racial group is always socially rather than biologically […]. In all racialized social systems, the placement of people in racial categories involves some form of hierarchy that produces definite social relations between races (p. 469).

This form of social organisation enables colonialism, enslavement, labour exploitation, indentured servitude, and, more recently, colonial, and neo-colonial labour immigration. All of them have been historically associated with the designation of a people in terms of race (Bonilla-Silva, 1997; 2015; Munanga, 2004; Kirkland, 2021). Black people were labelled as stupid, dishonest, and therefore more likely to be dominated as enslaved people. It was essential to associate black people with the animal world, concomitantly with the eradication of their human qualities, in a complex social system where they were dominated and treated as commodities, a system based on colonialism and slavery, from which economic management and inclusive and exclusive policies have been developed (Devulsky, 2021).

In this sense, in this doctoral dissertation, I refer to *race* as a structural and brutal social border that systematically influences social discourses, social practices, and preconceptions

[19] Translated from: É justamente a partir daí que aparece a necessidade de teorizar as "raças" como o que elas são, ou seja, construtos sociais, formas de identidade baseadas numa idéia biológica errônea, mas eficaz, socialmente, para construir, manter e reproduzir diferenças e privilégios. Se as raças não existem num sentido estritamente realista de ciência, ou seja, se não são um fato do mundo físico, são, contudo, plenamente existentes no mundo social, produtos de formas de classificar e de identificar que orientam as ações dos seres humanos.

based on both phenotypic and cultural distinctions. Race is a social construction and, accordingly, I also refer to racism as a social construction with a collective shape in a racialised social system. Both relate to ongoing, contradictory, self-reinforcing, plastic processes subject to the macro and micro forces of social and political struggle and daily decisions (López, 2013).

Racism arose through attempts to understand race based on biological characteristics and physical traits, such as skin colour. However, it could be founded upon psychological and emotional characteristics, as well as geographical origin, religion, language, and customs (Bonilla-Silva, 1997; 2015; Almeida, 2019). The racist apprehension of the people thus incorporates historical, cultural, aesthetic and biological data, in which the proportion of epidermal pigment is only one of the defining elements of race (Devulsky, 2021).

Race and racism are dynamic concepts. They are constantly changing, developing, blending, and differentiating in response to sociocultural changes (Du Bois, 1970). Racism yesterday is not the same today. There is no invariant racism, but *racisms* that make up a wide range of situations (Djamila Ribeiro, 2019; Balibar, 2021b). For example, the meaning of black and white changes within the broader racial system.

Uncertainty, conflict, power, and decision are all terms that can be used to describe racism. It is inscribed in a set of actions that guides a set of social relations and practices along racial lines (various forms of violence, contempt, intolerance, humiliation, and exploitation). It increases the chances that a person will face humiliation, live in poverty, and have a lower life expectancy (Telles, 2003). Opportunities in life depend on the categorisations associated with race. Societies generate specialised processes that produce and reproduce racial inequality at all levels.

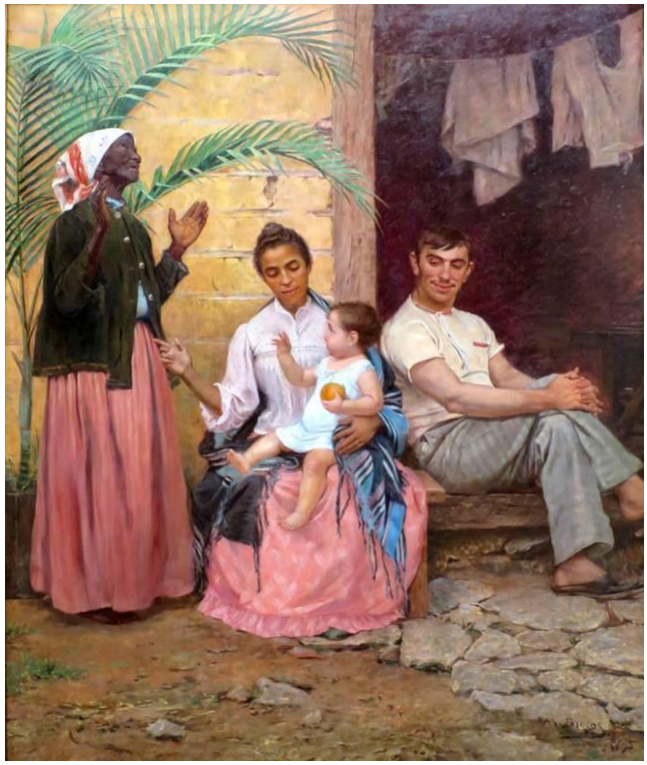
I consider, under the umbrella of those who do not benefit from white privilege, blacks, immigrants, indigenous peoples, Asians, and Jews (amongst others). This goes beyond the binary race paradigm—a tendency to frame racial issues in binary terms, such as black and white. I shall refer to the people who are the subject of this investigation as non-white[20] people, since I do not refer only to black people when I consider immigrants. In this sense, when this doctoral dissertation refers to non-white people, it refers not only to black people but also to people who do not identify as white.

[20] I am aware that naming people who are not white as non-white people may imply that the lack of being white is the central point; they have a shared deprivation of whiteness (Silva; Paixão, 2014). However, in a system guided by white supremacy, the suppression of groups of people takes place via different mechanisms, including methods of identifying these groups. The use of the term non-white in this doctoral dissertation is intentional, to draw attention to this point.

According to Telles (2014), even though the use of the concept of race has apparently declined in importance, in countries such as Brazil, Cuba, and Mexico there is still a racial problem insofar as the racial groups have different life chances. The global effects of racial struggles can potentially alter the meaning of racial categories and the racialised group's position in a social construction (Bonilla-Silva, 1997).

2.2 Racism and Pigmentocracy in Brazil

Figure 2: The Redemption of Cam (1895)



Source: https://upload.wikimedia.org/wikipedia/commons/d/d3/Reden%C3%A7%C3%A3o.jpg

Figure 2 shows the painting "The Redemption of Cam", created by the Spanish painter Modesto Brocos (1852-1936) while he was teaching at the National School of Fine Arts in Rio de Janeiro. According to Lotierzo (2013), the painting is a message in defence of racial miscegenation oriented towards whitening. The black woman with her hands up to the sky, as if thanking God for a miracle, catches one’s attention. The parents look with pride at their child, who stands in the centre of the scene dressed in white in a re-enactment of Jesus Christ in the manger. The characters become clearer over the generations of the family, portrayed in a variety of skin tones, showing confidence in the reversibility of black to white.

This painting represents the racial socialised system in which Brazilian society was structured. After the Portuguese invasion, in addition to indigenous peoples, the kidnapped African groups became part of the Brazilian, alongside European people. Later on, Asian and other populations joined the new world in a social organisation based on white hegemony. Brocos's painting illustrates the way in which Brazilian society was composed in terms of structural racism, with complexity compounded by contradictions and injustices.

The Brazilian society is structured in a racialised social system. In other words, it is inherent to the social order because of the social structure itself. Although it is more than 130 years after the end of slavery in Brazil, the "big houses" and "slave quarters" remain in the social organisation that demarcates the place of white and non-white people. The assumption of whites' superiority is so ingrained in political, legal, and economic structures that it is almost unrecognisable, because it reproduces social practice (Martinez, 2014; Almeida, 2019). To better understand the constitution of Brazilian society through the frame of a racialised social system, it is fundamental to keep in mind the association of barbarism and stagnation with the black population throughout Brazilian history, and recognise that the miscegenation of the population was an essential element in social outlining.

Miscegenation in Brazil projected the international image of a racially democratic country (Guimarães, 2001). The Brazilian sociologist and nationalist Gilberto Freyre (1900-1987) portrays in his book *Masters and Slaves* (1933) a supposedly harmonious relationship between slave owners and enslaved people during the colonial period. According to the author, slavery in Brazil involved good masters and submissive enslaved people. He stated that this supposed peace comes from the fact that, unlike other slave-holding countries (such as the United States), in Brazil there was a miscegenation of African people, Portuguese colonisers, and the indigenous, which was a viable way to provide social evolution. This paved the way for the racial mixture to be celebrated as the basis of Brazilian national essence, and for Brazil to be a country without racial problems in the national imagination, consecrated in the racial democracy spectacles of samba, football, and carnival (Silva; Paixão, 2014; Telles, 2014).

However, the reality of miscegenation during the colonial period was not without hostility. Europeans, Africans, and indigenous people did not reproduce harmoniously. The alleged relationships between white masters and black and indigenous women were not, for

most of the time, consensual sexual relationships. The women were forced into relationships of rape and sexual abuse[21] (Guimarães, 2001).

According to Telles (2003), there is a paradox in Brazilian miscegenation. It was violent—a project aimed at whitening the population as the better prophylaxis solution for a nation with several failures of origin (black and indigenous). Increasing concern that a sizeable non-white population would imperil national development led to attempts to dilute blackness to the point where it disappeared, when Brazil would then become a modern nation (Telles, 2014; Schwarcz, 1993).

In the 19th century, the Brazilian elite promoted greater miscegenation through the large injection of millions of European immigrants into Brazil. They sought to design a white nation, through European immigration and their optimistic predictions that racial mixing would eventually lead to the whitening of the population. Generation after generation, the wish was that the country's racial profile would change from black or indigenous to white (Skidmore, 1976). But while they were providing incentives for European immigration, they were leaving the non-white population on the margins of society, which helped to intensify the social inequalities and injustices.

Miscegenation, referring to both biological and cultural mixtures, became a central trope for understanding racism in Brazil and it continues to be used as a point of contrast with other countries. Brazil touted itself as a racial democracy, which can be contrasted with the horrors of explicitly racist regimes in the United States[22] under Jim Crow, South Africa under Apartheid, and Germany under Nazism, for instance (Telles, 2014; Silva; Paixão, 2014).

However, once racial hierarchies were internalised beneath the veil of racial democracy, Brazil's miscegenation and racial dominance could be intersected without the use of apartheid. White supremacy could be considered a natural phenomenon, and covert racism could occur with degrees of tonality, given black and white people across the colour spectrum. In other words, racial mixture and racial inequalities coexist as equally essential facets of Brazilian race relations structured in an organisation system based on *pigmentocracy* and *colourism*, with lighter skin tones being privileged over darker skin tones. Those with lighter skin tones are

[21] Genomic data from samples of 1,247 Brazilians from different regions pointed to a primarily African and indigenous maternal genetic inheritance, while the paternal population is 75% European. African men left only 14.5% of their DNA, while indigenous people transmitted only 0.5%.
See more in:
https://www.uol.com.br/tilt/reportagens-especiais/dados-do-genoma-de-brasileiros-revelaram-violento-processo-miscigenacao/#page1

[22] Racism in the US is based on ethnic or racial origin and is hypodescent, rather than being founded on phenotype, like in Brazil (Nogueira; Cavalcanti, 1998, Marcus, 2012).

frequently seen as more desirable, clever, and successful, whereas people with darker skin tones have greater chance of suffering exclusion and violence (Silva; Paixão, 2014; Telles, 2014; Devulsky, 2021). A light-skinned black person is more able to gain entry to spheres of power, where darker-skinned black people are practically non-existent (Devulsky, 2021, Ribeiro, 2019).

Skin tone is not a factor in equal opportunity discrimination, and pigmentocracy should not be seen as a separate racialised process, but as one deeply entwined with class and other structures of dominance (Rampersad, 2012). Systematic association of black culture with poverty has made many people try to escape the stigmatised black category. In order to avoid being labelled as black, terms such as *mulato*, *moreno*, *pardos*[23] or "dark-skinned" are used[24]. However, depending on the classification used, *pardos* ("brown people") can be classified as black people, which places the majority of the population of Brazil in the category of black[25].

Pardos people are seen as typically Brazilian. On the one hand, they can be accepted and treated as white people. The more a person resembles a white person, either by physical or behavioural characteristics, the greater their chances of social belonging. Close to privileged classes, they have greater access to power positions, social mobility, and improved life chances. On the other hand, they can also be marginalised, experiencing realities closer to those of black people in the social structure.

According to Telles (2003):

> Mulattoes are less discriminated than black people. They are socially closer to whites and more likely to benefit from the symbolic and material benefits of proximity to whites. A double conscience allows people to accept racism because they are internally divided (p.141)[26].

In this sense, the differences in treatment are related to existentially white moulds. The consumption of clothes, aesthetics, language and, indeed, authors associated with a superior culture creates the false expectation of gaining access to environments of power (Devulsky, 2021). According to Almeida (2019):

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[23]"Brown people" can be used in this chapter as a translation of the Brazilian census category *pardo*; "black" refers to the census category *preto*, and when the word "black" is on its own it refers to the general designation for people of African descent in Brazil.

[24]In the US, for example, the term used to refer to African descent has changed from Negro to Black to African American. The use of *nigger* can be very offensive.

[25]The Brazilian demographic profile traced by the IBGE indicates that 56% of the country's population is black (a group composed of a population of *pardos* and blacks). According to 2010 census data, the percentage of blacks in Brazil was higher than that of whites (Silva; Paixão, 2014).

[26]Translated from: "Os mulatos são menos discriminados do que os negros. Estão socialmente mais próximos aos brancos e mais propensos a se beneficiarem dos benefícios simbólicos e materiais da proximidade com os brancos. Uma consciência dupla permite que as pessoas aceitem o racismo por estarem divididas internamente" (Telles, 2003, p.141).

> (...) in Brazil, in addition to the physical appearance of African descent, the class belonging is made explicit in the consumption capacity and in the social circulation. Thus, the possibility of "moving" towards an aesthetic related to whiteness and maintaining the consumption habit characteristic of the middle class, can make someone racially "white" (p.39)[27].

In Brazil, 84% perceive racism, but only 4% consider themselves racists. The Brazilian context, racism often appears without racists (Bonilla-Silva, 2003; Silva; Paixão, 2014). Brazil social system are unimportant lives in a position of racial neutrality, a kind of racism without race. Many Brazilians believe that racial distinctions in a racialised and that experiences of discrimination result from economic differences[28]. The rhetoric is that people are discriminated against because of their socioeconomic status, and each person is accountable for their own journey toward success and recognition. The refusal of racism is one of the central components that have developed Brazilian nationality based on a colour-blind neutrality.

According to the Brazilian constitution and legislation, all citizens are treated equally. However, unequal social order is fostered and takes place silently behind the misty meritocracy. The truth is that, in the background, race is a convenient mark for justifying economic class exclusion, resulting in pigmentocracy structured around racial hierarchies, with non-whites placed at lower levels, in subordinate positions. In contrast, whites occupy places combining control and access to resources, prestige, success, education, wealth, and power. As skin colour becomes darker, people lead shorter lives, receive worse medical care, complete fewer school years, and occupy more menial jobs than whites[29].

Hateful speeches directed at people in the north and northeast of Brazil often foster a negative and pejorative view of these regions. Regional segregation and a caricatured image of the population of the north and northeast are not coincidental; such segregation and caricatures are racist. This is because the population of the north and northeast parts is primarily composed of blacks and indigenous people, while other parts of the country are dominated by European immigration.

Poverty in Brazil has a non-white face and racism remains, regardless of class. Inequality and racial discrimination persist despite the absence of extreme segregation. "Blacks

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[27]Translated from: (...) no Brasil, além da aparência física de ascendência africana, o pertencimento de classe é explicitado na capacidade de consumo e na circulação social. Assim, a possibilidade de "transitar" em direção a uma estética relacionada a branquitude e manter o hábito de consumo característico da classe média, pode tornar alguém racialmente "branco" (Almeida, 2019, p.39).

[28]See more in:
https://exame.com/negocios/no-brasil-84-percebe-racismo-mas-apenas-4-se-considera-preconceituoso/

[29] See more in: https://portaldeimigracao.mj.gov.br/images/dados/relatorio-anual/2020/OBMigra_RELAT%C3%93RIO_ANUAL_2020.pdf
https://www.ilo.org/global/about-the-ilo/multimedia/maps-and-charts/lang--en/index.htm

and whites can live side by side and even get married, but racial ideologies will continue to be a very strong feature immersed in social practices, which act to maintain racial inequality" (Telles, 2003, p.149)[30]. Political, economic, and ideological discrimination in access to basic rights and goods strengthens social gaps. At the same time, the development of power relations, as well as the subjective experience of inferiority and an inability to participate in social circles, has paved the way for the strengthening of inequalities.

2.3 Xenophobia in Brazil

According to the International Organization for Migration (2009), *xenophobia* is defined as an attitude, prejudice, or behaviour that rejects, excludes, and frequently devalues people based on the perception that they are strangers or foreigners to a community, society, or nationality. Xenophobia can mean fear of foreigners or attitudes of hatred or contempt. Skinhead culture, neo-Nazi movements, xenophobic conservatives, defenders of white racial supremacy, and anti-Semitism all constantly remind us of the currently great hostility between groups and diversity, including the immigrant population.

As discussed in this chapter, racism is a social construction with a collective shape by a racialised social system guided by white supremacy. In this sense, I see xenophobia as also being shaped in a racialised social system considering nationalist ideologies. Nationalism is defined by a set of social features based on the homogenisation of the population (linguistically, culturally, and ethno-racially). It emphasises the uniqueness of a people's behaviours, language, culture, and particular physical attributes. A uniform and collective perception cultivates desires for national identification and the necessity of protecting from diffusion[31]. In this sense, it is impossible to discuss nationalism including racist movements. (Balibar, 2021a). Racism is a supplement to nationalism, which is never an independent concept since it is continuously incremented by various new terms such as civics, patriotism, populism, ethnicism, ethnocentrism, xenophobia, chauvinism, and imperialism. (Balibar, 2021b).

In terms of social parameters, racism and xenophobia draw dividing lines. They manifest themselves in the division of communities and the establishment of borders,[32] limits of tolerance and the maintaining cultural distances. They support separatist[33], independent, or

[30] Translated from: "Negros e brancos podem viver lado a lado e até se casar, mas as ideologias raciais continuarão a ser uma característica muito forte imersa em práticas sociais, que agem para manter a desigualdade racial"
[31] The myths of "pure race", such as Aryan purity, permeated the nationalist sense of Nazi Germany.
[32] In Chapter 3, I discuss more about borders and immigration.
[33] However, it is also possible to have religious or ethnic minorities seeking independent homelands to avoid oppression. This leads us to an aporia of evil and good nationalism, because there is no clear separation between

secessionist movements related to understanding a uniformised society. Exclusion can be manifested directly by the idea of "false nationals": Jews, immigrants, Indians[34], indigenous peoples, and black people (for example), for being outside the "core" of authenticity[35]. In this sense, racism and xenophobia evoke a "purism" for a nation in a racial and cultural sense.

The intersectionality that runs through xenophobia, racism, and immigration points to a place associated with the banality of violence. This association fostered the absurdities of forced labour camps and people's extermination, as well as what Balibar and Wallerstein (2021) call the delirium of domination of territories' dominant nations throughout the globe. The colonialism of several countries using forced labour, ethnic segregation and "genocides" (or systematic massacres of populations) occurred in the midst of these intersectional elements.

In this sense, racism impacts immigrant people's lives in different cultures around the world and in different ways, depending on the social, historical, and political context of the country in which they live. They may be excluded from the society in which they live due to discrimination, prejudice, or negative stereotypes associated with their culture, race, or country of origin; immigrants may be the target of hostility and violence from extremist groups, or individuals who hold racist views. Several regulations encourage the expansion of practices based on the logic of deportability and illegalisation; migration restrictions based on racism have spread and are guided by the goal of physical eradication and exploitation of a specific social group (Marinucci, 2018).

Thus, it is essential to consider the problem of racism when thinking about immigration and society. For example, eligibility for citizenship being tied to whiteness highlights the social construction of racism and the social construction of the immigrant. Critical Race Theory

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nationalism of the dominant and nationalism of the dominated—a nationalism of liberation and a nationalism of conquest.

[34] "In India, a similar process of hierarchisation by castes based on the Hindu creed also takes advantage of the skin tone indicator to delimit advantages and outline limits of socioeconomic mobility. As with the so-called untouchables, also known as dalits, as well as what sudras experience to some extent, the racial marker composes the complex network of attributes for each caste. Skin color is associated with the individual's place of belonging, materially interfering in all aspects of life in a predominantly Hindu society. In fact, crossing racial boundaries becomes socially punishable and reproachable in many parts of the world" (Devulsky, 2021, p.21).
(translated from: "Na índia, um processo semelhante de hierarquização por castas fundadas no credo hindu também se aproveita do indicador do tom da pele para delimitar vantagens e traçar limites de mobilidade socioeconômica. Como ocorre com os chamados intocáveis, também conhecidos como dalits, assim como aquilo experimentado pelos sudras em alguma medida, o marcador racial compõe a complexa rede de atributos para cada casta. A cor da pele é associada ao lugar de pertencimento do indivíduo, interferindo materialmente em todos os aspectos da vida em uma sociedade predominantemente hindu. Aliás, ultrapassar os limites raciais passa a ser punível e recriminável socialmente em muitos lugares do mundo") (Devulsky, 2021, p.21).

[35] Another example is the State of Israel, which has developed an intense racism directed at both "eastern" Jews (called "blacks") and Palestinians expelled from their lands and colonised.

(CRT) [36] provides an important contribution to the discussion of racism and immigration. Under the CRT lens, it is possible to go beyond the reduction of racism to economic or psychological factors, which is sometimes covered up under the justification of nationalism, diverting attention from anti-immigration practices and inequalities related to structural racism (Bonilla-Silva, 2003; Romero, 2008).

Critical Race Theory[37] adopts an intersectional framework for the exploration of differences within and between groups, taking account of issues such as historical and socio-political contexts while still maintaining awareness of racial inequalities (Rollock; Gillborn, 2011; Delgado; Stefancic, 2017). Uncovering the ways in which xenophobic discussions have acted as a mechanism to ensure the subordination of migrant groups essentially becomes a new way to unwrap the roots of imposing whiteness as the norm. CRT has attempted over the last decade to map the relationship between immigration and racism (Romero, 2008). Selective acceptance of immigrant populations is related to the persistence of racism in its capacity to disguise itself through the social system and hide the daily privilege that comes with being white as the norm and the mainstream.

In Brazil, together with the myth of racial democracy, the idea of receptivity to immigrant people was also spread, and camouflaged the real aspect of selective acceptance of those people. Indeed, although racism and xenophobia are on the list of unbailable crimes, the Special Secretariat for Human Rights has seen an increase in the number of complaints of xenophobia. The primary victims are Haitians and people of Arab or Muslim origin.

Mohamed Ali, a Syrian refugee resident in Brazil for three years, was harassed and verbally assaulted at his workplace in Rio de Janeiro. An exalted Brazilian man repeatedly shouts, "*get out of my country*!" by threatening Ali with two pieces of wood in his hands. "Our country is being invaded by these suicide bombers, who kill children", the Brazilian men said.

The racial practices and mechanisms can be seen as overt behaviour, which refers to noticeable, plain apparent actions. However, they can also manifest as covert behaviour, with clandestine, behind-the-scenes actions (Bonilla-Silva, 1997). In the same way, the xenophobic and discriminatory expression "*get out of my country*!" can be expressed in all different manners, considering the complex distinction between so many countries and tribes throughout history and the globe. What indigenous and African people in Brazil endured, compared with

[36]See more about Critical Race Theory in: Ladson-Billings (1999); Taylor, Gillborn and Ladson-Billings (2023); Delgado and Stefancic (2013; 2017).

[37]Critical race theory is a crucial resource for addressing racism outside the US too (Skovsmose, 2023). Despite the American design to analyse white majoritarian society, CRT is flexible enough to be applied to a postcolonial non-white country (Rampersad, 2012).

Jewish people in Europe during the Nazi antisemitic era, or Irish and English people in historical times, may have been distinct forms of racism and xenophobia.

In another episode in 2020 in the city of Rio de Janeiro, an elderly woman was arrested for racism and injury after insulting a student, Marie Okabayashi, who was Brazilian and of Japanese descent. In the subway, the woman shouted: “Chinese pig! You are disgusting; you are passing disease to everyone” (here she referred to Covid-19). Marie reports that the woman stood up, cursing her and showing her middle finger. She complained: “The subway was crowded, and nobody said anything; only one girl was shaking her head in disapproval”.

Racial prejudice is an obstacle to immigrant people being recognised individually for what they are, as opposed to being seen as a set of stereotyped and negative characteristics (Balibar, 2021-a). The invisibility of agendas related to immigrants in anti-racist studies and policies emerges as an angle to be more carefully considered.

> Suppose racism and colourism among blacks, Asians, Indians and indigenous peoples have different criteria and characteristics. In that case, there is no doubt that the economic and social repercussions linked to impoverishment and marginalization are often similar. Therefore, this play of lights must aim at the plurality of dimensions that society comprises. There is light for everything and everyone. The challenge of this exercise is to do it considering that the focus must be on the whole of the room, using something more extensive than a lighter to illuminate its largely forgotten constituent axes (Devulsky, 2021, p.39)[38].

In a racialised social system, different groups can be targeted by racial labels not just linked to skin colour but also based on other differences. Xenophobia can be understood as an apparent behaviour involving hostility and violence. Nevertheless, the divisions based on the We-Other dichotomy, the destruction of cultures, and the imposition of colonisers' ways of life are all systematic.

In this context, immigrants can be subordinated in a social logic impregnated with racial tension, and become marginalised, invisible, foreign, and “un-Brazilian”. Given what is presented in this chapter, we can move on to discussing immigration and inclusive mathematics education in the following chapters.

[38] Translated from: Se racismo e colorismo entre negros, asiáticos, indianos e indígenas possuem critérios e características diferentes, não há dúvida de que as repercussões econômicas e sociais ligadas ao empobrecimento e à marginalização são muitas vezes semelhantes. Portanto, esse jogo de luzes deve visar à pluralidade de dimensões que a sociedade comporta. Há luz para tudo e para todos. O desafio desse exercício é fazê-lo considerando que o foco deve primar pela totalidade da sala, usando algo maior do que um isqueiro para iluminar seus eixos constitutivos tão largamente esquecidos (Devulsky, 2021, p.39).

3 IMMIGRATION AND BORDERS

Muitos vêm daqui, outros vêm de lá
Tem no Haiti, tem no Panamá
Tem no Morumbi, tem no Paraná
Filhos de Nagô jogam Caxangá
Tem Paris, Paquistão, tem Madri, tem Milão
Tem Mali, tem Gabão, tem Afeganistão
Divididos por classe ou por religião
Uns alegam que não, mas é clara a visão
Rael/ Israel Feliciano[39]

Critical mathematics education, as described in the introduction chapter, expresses concerns about society, students, and learning environments. In this chapter, I will draw attention to the immigrant students and their families. Comprehension of the social environment, aspects of immigrants' contexts, and their conditions and needs will be the core of further engagement in a discussion about learning mathematics environments mediated through concerns of inclusive mathematics education in this dissertation.

According to the World Migration Report[40] published by the International Organization for Migration (OIM), in 2022, before the Ukraine crisis took shape, there were roughly 281 million[41] international immigrants[42] in the world—an increase of sixty-one million people since 2010. Thus, 3.6% of the global population is represented by people who live in countries other than where they were born.

Many people are forced or obliged to leave their homes or places of habitual residence and move within a country or across international borders in order to stay and live in another destination (host place) (Kok, 1999; UNHCR, 2019). There are many reasons for people to immigrate by force (become displaced) or by their own free will. Some people move to pursue better job opportunities or a more favourable environment for living, since countries do not develop on equal terms. According to Rosenberg (2022), racial inequality and colonial exploitation affect the immigrant's home country. Thus, growing inequalities between

[39] A possibility for translation: Many come from here, others come from there/ There's Haiti, there's Panama/ There's Morumbi, there's Paraná/ Sons of Nagô play Caxangá/ There's Paris, Pakistan, there's Madrid, there's Milan/ There's Mali, there's Gabon, there's Afghanistan/ Divided by class or by religion/Some claim not, but the vision is clear.

[40] See more in: https://worldmigrationreport.iom.int/wmr-2022-interactive/

[41] It is estimated that there are more than twelve million *stateless people*, who do not have citizenship of any country or state. It therefore may not be accounted for by statistics due to lack of records.

[42] In this doctoral dissertation, the word *immigrant* is used in reference to the country moved *to*, and *emigrant* is used about to the country moved *from*. I use the word *immigrant* more often, with Brazil as a reference location. The emphasis is not on Brazilian people who moved and lived in other countries (emigrants), but on people who came from other countries and reside in Brazil (immigrants). However, the word *migration* is also used to reference to arrival and departure flows in general.

countries, resulting from asymmetries and social injustices, increase the motivation to immigrate and take advantage of opportunities and amenities apparently created in other countries (Soares, 2015).

Furthermore, many people live in displacement[43], fleeing from conflicts, wars, religion or homophobic persecution, natural disasters, and so on. Refugees[44] have been forced to leave their countries and require international protection because of persecution and violence (Koser, 2007). Conflicts such as in Syria, Afghanistan, and South Sudan have increased global displacements that are accompanied by one of the biggest humanitarian crises of today[45], resulting in a contingent of people in vulnerable situations.

Migration is part of the history of humankind. People have always been migrating, individually and in groups. During the 14th and 15th centuries, the world was widely shaped by migratory patterns, mainly during the great navigation (Koser, 2007).

In addition to being a social phenomenon, migration is a human right in the sense of demonstrating the right to come and go. It is a global phenomenon that shapes societies. It gives rise to other social, cultural, political, and economic contours (Diener; Hagen, 2012; Romero, 2008). So then why does a contingent of immigrant people face situations of vulnerability, intense inequality, and social injustice? Paths for possible answers to this question are embedded in multiple and interconnected dynamic structures of oppression (Tummala-Narra, 2020). Additionally, it has to do with how borders are created and how they function in relation to concerns of access, mobility, and inclusion.

Immigrants' lives might be shaped by their feelings of being "unwanted" and lacking a sense of belonging. There is an intersectional fine line between being a member of a “desirable” or an “undesirable” group. This means that axes of oppression intersect and, at the intersection of these axes, immigrant populations are faced—at the same time—with different flows that oppress them (Stasiulis; Zaheera; Rutherford, 2020; Rosenberg, 2022).

This dynamic is intersectionally shaped by social markers of difference, which produce racial (un)desirability and persistent inequality (Tummala-Narra, 2020; Stasiulis; Zaheera; Rutherford, 2020). Consequently, undesirability of immigrants depends on a racially based system of discrimination, inequality, and colonial exploitation (Rosenberg, 2022). The way that

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[43] In 2020, about 89.4 million people were displaced in the world. This includes refugees and asylum seekers. In 2020 there were 70.8 million refugees worldwide. That is twice as much as twenty years before.

[44] UNHCR (2019) estimates that there are about 70.8 million refugees around the world. This contingent is equivalent to twice the number of forced displacements registered twenty years ago—a number that exceeds the population of France and could form the twentieth most populous country in the world.

[45]See more in: https://g1.globo.com/mundo/noticia/numero-de-refugiados-e-deslocados-cresce-em-2016-e-e-o-maior-ja-registrado-diz-relatorio.ghtml Accessed 28th June 2020.

migratory movements are controlled, filtered, and blocked by border regimes has a more general effect on the constitution of various social institutions, such as schools. Furthermore, one in seven international migrants (about thirty-eight million) is under the age of twenty—therefore many are of school age.

Racial desirability dynamics also lead to a bordered land in education. In this sense, we can reflect on immigration for educational purposes—particularly on exclusion and inclusion processes. I consider it crucial to reflect on mathematics education for immigrants and how it can replicate the inequities and social divisions/borders in broader society (Skovsmose, 2023; Gutiérrez, 2013).

This chapter aims to discuss the social aspects linked to migratory movements worldwide and how immigrants are exposed to several forms of the border in the face of exclusion/inclusion duality. As in Chapter 2, xenophobia, racism, and immigration will be discussed as interrelated axes of oppression—but with an approach focusing on (un)desirability of the immigrant population.

In the first section, discussions will be held in order to understand what constitutes a conceptual understanding of borders and how they can be expressed socially. In the second session, I discuss how such borders can define limits to immigrant populations since they used to support social inequalities. Moreover, in the final section, I discuss the context of immigration in Brazil, confronting the myth of racial democracy.

2.4 Borders: The scars of history

Figure 3: Great Wall of China

Source: https://pt.wikipedia.org/wiki/Muralha_da_China#/media/Ficheiro:The_Great_Wall_of_China_at_Jinshanling.jpg

Throughout history, bordering spaces have been an essential part of human activity. Humans draw lines that address access, mobility, and belonging issues in different ways. Different social categories and behavioural expectations are established and represented by borders. They are central to current international challenges such as security, migration, trade, and natural resources (Koser, 2007). However, for whom are borders created? By whom? And for what purpose?

The process of bordering seems natural and timeless. Nevertheless, they are only present in the world to the extent that people consider them meaningful. They are a social construction. They reflect changing political, social, and economic contexts (Diener; Hagen, 2012).

To better discuss the complex and sometimes ambiguous meaning of the word "border", I will consider the meaning of border in two categories: geographical and social. A *geographical border* is a line that separates different regions on Earth. They are politically delineated to separate territories or maritime zones between political entities. They define political measures combined with government control and nationalistic ideologies. Borders outline the planet's surface and define the map's design; they define countries, states, provinces, cities, and towns. Sometimes borders are lines in the sand, demarcations in the sea, long walls, or fortifications to determine spatial limits (Szary, 2015). Borders can operate as a form of gatekeeping, restricting people from entering or leaving a country. However, they can also divide people within the same country who share similar lifestyles, customs, languages, and faiths.

In the past, many cities struggled to protect their territories from barbarian invasion[46]. They constructed long walls and fortresses surrounding the cities. Remnants of fortifications like the Great Wall of China[47] remind us of the clearly defined geographical limits of Roman and Chinese imperial authority, for instance (Figure 3). Apart from providing defence, they enabled the collection of duties and also immigration and emigration control.

Borders were essential for colonisation worldwide, demarcating geographical lines that served as a reference for land division. European border demarcations over "new world" territories changed cartographies in many places worldwide. Such cartography of the modern globe has become increasingly accessible to the flow of goods and reflects on the modern diaspora. Although the non-European societies possessed their own conceptions of territorial

[46] See more discussion about barbarian people in Chapter 4.
[47] Building began in the 3rd century BC and took hundreds of years before definitive completion. There are twenty-one mil kilometres of extension.

organisation, European colonists created the borders in American and African countries and did not always consider the different groups living in those areas (Diener; Hagen, 2012).

More recently, borders are also essential—for instance, in North Ireland—as a wall marking political and religious division. Also, Germany was divided by a wall after World War II, and separated into East and West Germany[48]. Borders along the Mediterranean at the Gaza Strip are separations because of conflict between Israel and Palestine, both of which dispute the ownership of this region.

In 2019, the then-President of the USA, through the slogan "Build a wall and make Mexico pay for it", defended the strengthening of borders to reduce the volume of immigrants travelling across the borders between the United States and Mexico[49](Figures 4) [50]. Supporters of the wall building throughout the globe claim that an uncontrolled "invasion" of immigrants into the country reduces resources, decreases wages and jobs, and offers an entry point for drugs and terrorists. On the other hand, critics of the walls argue that borders should be protected by more modern and compassionate measures rather than through the natural selection of people[51].

Figure 4: Geographical borders at Tijuana, Mexico

Source:https://abcnews.go.com/International/video/migrant-crossings-plummet-mexico-cracks-64237051

[48] Germany was divided from 1949 to 1989 and became one country again in 1990.
[49] In 2019, on average, 100 Brazilians were arrested monthly when they tried to enter the US through the border with Mexico, reaching 30,000 apprehensions yearly.
[50] See more in:
https://abcnews.go.com/Politics/migrant-crossings-us-border-plummet-mexico-cracks/story?id=64228594
[51] Velasco (2019a) calls the borders built to contain migration "scenic devices" or "smokescreens" that emerge as "an icon of exclusion of others in the hope of reassuring oneself with the false picture of a comforting order" (p.165). As a result, the walls have become a theatrical ornament placed in front of people increasingly concerned about their future prospects. Political theatricality, by generating an obsession for those who electorally profit from the false fear of "immigration invasion", has also served as an inspiring light for other countries.

Geographical borders are (re)defined in terms of conquering territories and resources, as well as population control. Lands can be traded or sold peacefully. Nevertheless, in many cases, the land is divided among governments after deadly battles or unequal agreements. In this sense, borders are what Velasco (2019-b) calls *the scars of history*. This metaphor implies that the genesis of borders is conflict, suffering, and violence. Some borders are recent scars and still bleed like open wounds, while others are older but remain painful.

By *social borders*, I refer to borders related to other kinds of divisions expressed in spatial and social lines. They are not always recognisable and can be symbolically expressed through social ideologies, regulating space and time and reflecting on social categories of wealth, power, and privilege. Such borders are structurally and intersectionally marked by race, nation, geographic origin, and gender (Mezzadra; Neilson, 2017). Social borders do not necessarily define cities or countries themselves, but together with geographical borders, they are intertwined in spatial and social division, reflecting particular interests and representing different ideologies.

Figure 5: Apartheid in South Africa

Source: https://thecenturytimes.com/1474/student-submissions/south-africas-segregation/

Figure 6: Auschwitz concentration camp

Source: Author's Archives

During apartheid in South Africa, for instance, several borders delimited the space between black and white people (Figure 5). During Nazism, borders were essential to delimit the space for those who did not deserve to live (Figure 6). In the past, Catholic churches also used borders to restrict access of particular groups of people to church. People with disabilities also face borders of accessibility (Figure 7) and homophobia can be a delimiting stake for one who wants to be a soccer player in Brazil. One can consider all these examples as examples of social borders.

Figure 7: Social Borders and accessibility

Social borders can be subtle in perception but very intense in social exclusion consequences. It gives limits to certain groups and privileges to others. Through such borders, it is possible to define different income levels, access to material and cultural wealth, and positions of power. The rights that people may or may not enjoy—situations of autonomy, emancipation, servitude, and subjugation—are related to such borders. In general, borders reflect contradictions such as opportunity and insecurity, meeting points and conflict points, places of cooperation and competition, ambiguous identities, and assertive claims of difference (Diener; Hagen, 2012; Romero, 2008).

Figure 8: Inequality for kids

Source: Uğur Gallenkuş

Racism can be a limiting point for many non-white people and xenophobia can be a border for immigrant populations around the world (Oliveira, 2019). Constructing walls and other sorts of borders worldwide raises questions about the legitimacy of border control. Countries have restricted immigration in the interest of societal well-being and national order and security (Romero, 2008).

Geographical borders and social borders are related categories. Both coexist in their visibility and opacity. Such borders serve as a demarcation of spatially and socially differentiated opportunities between people. They foster the way we determine “us” and “them”; “insiders” and “outsiders”; “we” and the “others”; “in place” and “out of place”[52].

[52] See more about We-Other dichotomy in Chapter 4.

Migratory movements are not only related to movement across geographical borders but also to different types of social borders that immigrants might face. The concept of borders is wrapped in an ideological, economic, and cultural tangle. There is an "[…] increase in the value attributed to the discriminatory function of borders, which serve as dividing lines between desirable and undesirable flows" (Velasco, 2019, p.163)[53].

Borders mark different territories and also separate desirable from unwanted people.

Mathematics education can establish borders within and outside school (Radakovic; Limin, 2020). Thus, I see the concept of borders as a powerful way to examine current trends in mathematics education with immigrants and move towards overcoming borders and fostering inclusive action.

2.5 Desirable/unwanted immigrant people

According to the UN's migration agency, a sharp increase in the deaths and disappearances of migrants at sea, trying to reach other countries, has led to concerns about this dramatic situation. Shipwrecks are believed to be frequent occurrences[54]. Reports of remains washing ashore along the coastlines or being trapped in fishing vessels' trawl nets further indicate "invisible shipwrecks."

Figure 9: Invisible shipwrecks remains drowned in a shipwreck off the coast of Libya.

Source:https://www.aljazeera.com/news/2020/12/18/invisible-shipwrecks-belie-falling-migrant-deaths-un/

[53] Translated from: "[...] aumento do peso atribuído à função discriminatória das fronteiras, que se tornam linhas do território onde ocorre a classificação entre fluxos desejáveis e indesejáveis, entre mercadorias e seres humanos" (Velasco - a, 2019, p.163).

[54] See more in: https://news.un.org/en/story/2021/09/1101072

Figure 9 shows traces of shipwrecks on the coast of Libya and illustrates situations of shipwrecks not officially confirmed because the ships cannot be located, and the information is insufficient. There are gaps in the monitoring and registration of such tragedies. In the case of many shipwrecks, such people's deaths are not officially recorded by statistics. Thus, such people become essentially invisible.

This situation illustrates that a particular group of immigrants can be affected by invisibility and reflects an organisation with a complex social structure permeated by social injustice. These people are forced to move for many reasons, and they are not welcome in other countries. Because they are "unwanted", they undergo risky and clandestine crossings. In a tragic conclusion, many end up on a list of missing people and are invisible in statistics.

Inspired by Rosenberg (2022), I propose two categories of immigrant people: *desirable* and *unwanted immigrants*. These two categories are not clearly delimited in the sense of who can be targeted in each category. However, using such categories is merely an attempt to run the discussion smoothly. Indeed, the "level of acceptance" can vary in each situation, and desirable and unwanted immigrants do not face the same kinds of borders in the same way. Besides, desirability shapes immigrants' lives along a spectrum, with *desirable* and *unwanted*[55] statuses at the extremes. It creates a wide range of welcoming levels that determine the potential types of borders they might come across and their challenges for immigrants' societal positions.

As *desirable immigrants*, one can consider those who might have the opportunity to choose which country they want to live in, and the financial situation is not such a border to them making this decision. Someone invited to work in a multinational corporation in another country, a retired European man who decides to live in Thailand, or a scholarship student selected to study abroad might all be examples of desirable immigrants.

As *unwanted immigrants*, one can consider those immigrants, refugees or not, that, facing unsafe and unbearable situations in their home countries, are led to cross national borders in search of safety and better conditions for life in other countries—for example, Venezuelan and Haitian people who cross borders to migrate to Brazil.

The unwanted immigrants are seen by the destination country's population as competitors for jobs, as burdening social services and infrastructure expenses, and as a permanent threat to social and political stability. They are, as stated by Martine (2015), "parasites" in the face of accounting of costs and advantages, understood not only in the economic sense. Thus, unwanted people are tolerated if there is a need for human resources.

[55] See more about *desirable* and *unwanted immigrants* in Chapter 3.

From the moment the shortage of work begins, this presence becomes undervalued (Sayad, 1998).

For most *unwanted immigrants*, the impossibility of finding a country that welcomes them is a reality that leads them to precarious modes of crossing borders. Many people die on overcrowded maritime vessels or while travelling through deserts, trying to reach a country that will guarantee their protection.

An example is Nabir, a Syrian refugee who tried to cross Turkey to Greece by swimming across the Aegean Sea. He stated: "What difference does it make to die in Syria or at sea?"[56] His speech reveals the extreme vulnerability faced by immigrant people from many countries while trying to cross geographical borders to other countries.

During crossings, immigrants also face the risk of human trafficking—being recruited through deceptive promises of better work and living conditions in other countries. These people might feel threatened and intimidated, forced into labour, sexual exploitation, and other types of brutality once they get to their destination. Human trafficking can also target kids and include organ trafficking.

Figure 10: Inequality and immigration

Source: Uğur Gallenkuş

However, the dangerous situation experienced by immigrants worldwide is revealed not only while crossing geographical borders. They might encounter and experience social borders at their destination—borders related to policies, legislation, and racism, for instance (Rosenberg, 2022). Such social borders define roles and distinguish spatially distinct

[56] See more in: https://www.bbc.com/portuguese/noticias/2015/09/150901_sirio_refugiado_grecia_mb_cc accessed on 25th June 2020.

possibilities for unwanted immigrants who encounter everyday obstacles in a network of social interactions (Romero, 2008). According to Santos (2018),

> It is not just concrete walls that are placed in front of people who migrate. There are language barriers, local customs and laws, cultural differences, several obstacles such as the reach of migratory documentation, the validation of the diploma, the difficult access to the banking system, the period of adaptation and recognition in territorial terms of the new neighborhood and of the city, even missing the life he left behind and the people who remained in his country of origin. (n.p)[57]

Classifying unofficial (undocumented) immigrants as illegal immigrants, for instance, can lead many people to vulnerability and exploitative situations. Such immigrants find themselves in a position to accept adverse working and living conditions under those who take advantage of their *desenraizamento*[58] and clandestineness.

When treating the subject of migration as a crisis in which the immigrant or foreigner is a problem to be solved, a xenophobic viewpoint might be strengthened. Such conduct widens social borders and encourages aversion and suspicion toward immigrant populations.

However, immigration is a sign of more outstanding intersectional issues such as human rights violations, structural racism, environmental injustice, ecological apartheid, and armed racial conflict, for instance. Such issues go beyond geographical border matters. Rosenberg (2022) claims:

> Immigration led to a racist backlash in the past, and it leads to a racist backlash today. This backlash occurs because leaders and citizens are explicitly racist against outsiders. In fact, immigration restrictions are inherently racist and are the product of racial capitalism. These policies have racist origins, have always been tied to colonial practices and raced notions of desirability, and continue to directly and indirectly perpetuate racist ends (Rosenberg, 2022, p. 17).

Given this context, there is an excellent effort to organise legislation that addresses immigrants' demands. Organisations such as the UN (United Nations), UNHCR (United Nations High Commissioner for Refugees) and IOM (International Organization for Migration) have come together to face these challenges. The Universal Declaration of Human Rights (1948), intensely discussed at the Cairo Conference in 1994, seeks to guarantee the expansion

[57] Translated from: “Não são apenas os muros concretos que se colocam diante das pessoas que migram. Há barreiras linguísticas, de costumes e leis locais, de diferenças culturais, diversos entraves como o alcance da documentação migratória, a validação do diploma, o difícil acesso ao sistema bancário, o período de adaptação e reconhecimento em termos territoriais do novo bairro e da própria cidade, até a saudade da vida que deixou e das pessoas que permaneceram no seu país de origem”. (Santos, 2018, n.p.)

[58] State of being expelled or removed from their place of origin, voiding or suppressing a custom. When people stray from their family, their social and cultural roots, they begin to experience a strangeness that affects their identity.

of rights inherent to the human condition itself, thus minimising the exploitation of immigrants. Overall, the crises are not migratory themselves, but rather political, economic, and humanitarian (UNHCR, 2019).

2.6 Brazil: A country for everyone?

Figure 11: Os Retirantes

Source: https://masp.org.br/busca?search=retirantes

Figure 11 presents the art “Os Retirantes”, painted in 1944 by the Brazilian painter Cândido Portinari. It is part of the collection of the São Paulo Museum of Art Assis Chateaubriand (MASP) in Brazil. In the style of expressionism, it portrays a family that needs to leave their land to escape poverty and hunger. With tired faces, they search every day for better living conditions. This painting exposes the suffering of immigrants who fled the arid life of the Brazilian north-eastern hinterland, migrating towards a place more conducive to survival. Indeed, it is possible to say that this image goes beyond borders and can express many other contexts at different moments in the phenomenon of immigration.

Some points are relevant to immigration in Brazil. Firstly, Brazil is intersectionally marked by long-lasting structural racism and international immigration. With the prohibition

of the slave trade in the 19th century, arising from the need for immigrant workers, the government—in a clear eugenetic[59] policy—repelled the immigration of blacks and preferred people from Europe[60]. Thus, a large flow of people began in Brazil, coming not only from Europe, but also from Asia, attracted by subsidies and land offered by the Brazilian government. By 1920, for instance, the immigrant population in São Paulo was substantially more extensive than that of its Afro descendants (Andrews and Fuente, 2018).

Nevertheless, positive national images were produced based on miscegenation and receptivity to international immigrants. This scenario is marked by racial neutrality and rhetoric of the absence of an explicit intent to discriminate against people, which justifies discourses denying the existence of xenophobia and racism in Brazil (Telles, 2009).

However, there is a hierarchy that categorises newcomers along racial lines. Newcomers perceived as deviant from the dominant racial norm are the main targets of hatred and violence that produce different social, educational, economic, and political impacts on their lives.

The reality of Brazil is made up of clearly delimited social borders (Silva and Paixão, 2014). For example, one can consider residential segregation—a geographical division in which, on one side, there are favelas and ghettos[61] resided by much of the population, and, on the other side, luxurious and wide houses for the elite of the population (Figure 12). The borders between those places have not previously been defined on a map but are explicit due to social borders. Walls, fences, and barbed wires are used to delimit spaces under the support of private proprietary ideologies. According to Diener and Hagen (2012):

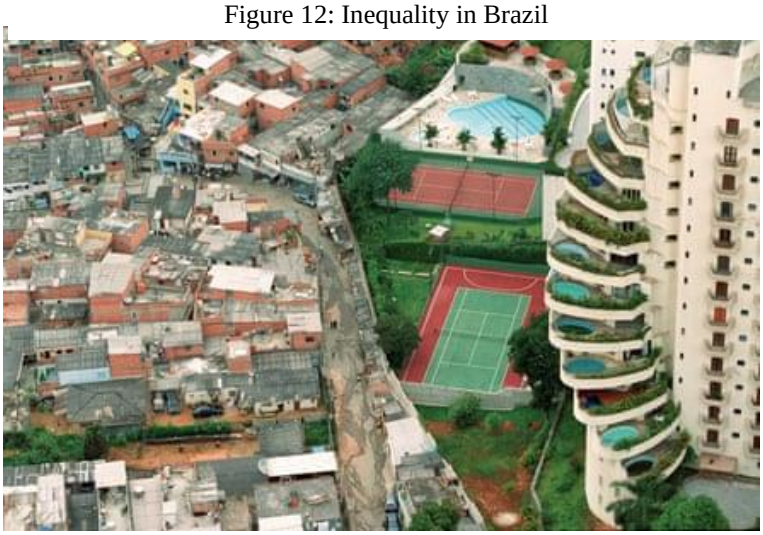
> The growth of gated communities is one of the most recent developments in residential segregation. As the term suggests, these neighborhoods utilize walls, fences, checkpoints, guards, and surveillance equipment to create spaces of security and privilege (p.56).

[59] Eugenetics: variation of the word eugenesia, concerning the means of bringing about the improvement of the human race.

[60] According to Carneiro (2018 - b), "the quest was to enable white "virtues" and "superiority" to prevail over the "blemishes" of blackness, "saving" Brazilian society from its inexorable backwardness" (p.27).
Translated from: "No Brasil a busca era em possibilitar que as "virtudes" e a "superioridade" branca predominassem sobre as "máculas" da negritude, "salvando" a sociedade brasileira de seu inexorável atraso" (Carneiro, 2018b, p.27).

[61] See more about Ghettoisation in Chapter 10.

Figure 12: Inequality in Brazil



Source: Tuca Vieira in https://www.theguardian.com/cities/2017/nov/29/sao-paulo-tuca-vieira-photograph-paraisopolis-portuguese

It is in this context of social injustice that, according to Carneiro (2018-a), Brazil is historically shaped by the institution of unwanted immigrants and restrictive migration policies:

> Migratory regulations in Brazil, especially from the 1930s onwards, are established [...] by rules that establish a situation of exclusion of rights for immigrants, especially those considered legally "undesirable", destined, therefore, for an irregular stay and precarious in the Brazilian territory (p.61)[62].

Between 1964 and 1985, the Foreigner Statute (Lei nº 6.815/80) was based on national security and the protection of Brazilian workers, and established a series of restrictions on immigrant rights. One of the ways to discourage undocumented migratory movement in Brazil, for example, was preventing undocumented immigrant children from enrolling in Brazilian educational institutions.

With the Brazilian Federal Constitution of 1988, there was equality between Brazilians and immigrants in exercising and guaranteeing most fundamental rights. This paved the way for the Migration Law (Lei nº 13.445/2017) of 2017, which included a human rights perspective in compliance with the constitution. This law is committed to the repudiation and prevention of xenophobia, racism, and any form of discrimination against international migrants and the right to public education, prohibiting discrimination based on nationality and migratory status. That is, a person's migratory status no longer defines whether or not he or she can exercise fundamental rights.

[62] Translated from: "As regulações migratórias no Brasil, especialmente a partir dos anos 1930, são estabelecidas [...] por normas que instituem uma situação de exclusão de direitos aos imigrantes, especialmente àqueles considerados legalmente "indesejáveis", destinados, portanto, a uma permanência irregular e precária no território brasileiro (Carneiro, 2018 - a, p.61).

Even though the new immigration law has facilitated the entry and documentation of new immigrants in Brazil, several barriers are still imposed on the permanence of these people who sometimes face humanitarian difficulties (Romero, 2008). Furthermore, such legislation for the immigrant population appears to be vulnerable to changes in government policies.

For instance, in 2019, Brazil withdrew from the Global Compact for Migration, following the position of countries such as the United States and Israel. By decision of the Brazilian government at the time, the country ceased participating in the Global Migration Pact under the understanding that immigration should not be treated as a global issue, but rather in accordance with the reality and sovereignty of each country[63].

More recently, the migratory flow in Brazil has been characterised by the arrival of people such as Haitians, Angolans, Syrians, Chinese, and Filipinos, for example. With the diversity in Brazilian territories and the arrival of different peoples at different historical moments, the human rights of immigrants are tested. Moreover, the myth of migratory receptivity and Brazilian racial democracy, with substantial repercussions outside Brazil, fades away in the face of various discriminatory situations experienced by immigrants.

According to Carneiro (2018a), in Brazil "the foreign worker has been the victim of agency, of unfulfilled government promises, of discrimination against nationals in the measurement of rights, factors that precarious their conditions of existence" (p.75). Indeed, undocumented or not, unwanted immigrants might be subjected to precarious work in Brazil.

An agency specialised in hiring immigrant maids used advertisements such as: "Filipino workers are widely regarded as the best workforce in the world, specialised in domestic services. With a cheerful personality, they are always loyal and reliable when taking care of your home and family." The company brokered immigrant workers for domestic services in residences in Brazil. Filipino immigrants were subordinated to shifts that occupied the entire awake time. They were subjected to slave-like labour with no days off or labour rights. They claimed they even went to the hospital after vomiting and feeling dizzy due to lack of adequate food and uninterrupted work, a combination of exhausting hours, debt bondage, and forced labour[64].

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[63] The pact is the result of a multilateral agreement signed by the UN and its member countries in 2018; it works as an international instrument under a charter of principles, with twenty-three recommendations that seek to promote a more regular, orderly, and safe migration on the planet, respecting the dignity of migrants.
See more in:
https://g1.globo.com/mundo/noticia/2018/12/11/entenda-o-que-e-o-pacto-mundial-para-migracao.ghtml/

[64] See more in: https://reporterbrasil.org.br/2017/07/domesticas-das-filipinas-sao-escravizadas-em-sao-paulo/ accessed in 25th June 2020.

A similar situation also happened in the textile industry in São Paulo, where Bolivian immigrants were rescued from living in precarious conditions and working in clandestine clothing in conditions analogous to slavery[65]. Although they are not exclusive victims of this system of exploitation, immigrants often find themselves in exploitative conditions that characterise the violation of human rights.

Carneiro (2018b) carried out research with immigrant students at a university in São Paulo; the author reports a speech by a student from Peru. When asked if she felt a difference in treatment in relation to students of other nationalities, she says: “Yes [..], I see that they always organize trips, organize meetings with European students, but not with us” (p.27)[66]. Another student, also from Peru, states, “I never imagined there was such discrimination between whites and blacks. In my country there is not such discrimination for this. It impacted me a lot. This changed the idea I had about Brazil” (p.27)[67]. Such reports point out that discrimination experienced by immigrants in Brazil is permeated by racism.

Furthermore, in another situation, immigrant students at a state school in São Paulo report that they had to pay a "toll" to Brazilians to not be beaten up on leaving school. To feel safe, the students—mainly Bolivians—paid for snacks in the canteen or gave the Brazilians whatever money they had in their pockets.

Racism and xenophobia are borderline for immigrant people, accentuating social inequalities (Telles, 2003; Tummala-Narra, 2020). Thus, I see displacement and undesirability as brutal and racialised mechanisms for establishing borders between the We and the Other[68]; immigrant people become Others.

Thinking about the question “Brazil, a country for everyone?” leads to further reflection about the other question: “Is the world a place for everyone?”. Such questions, under the understanding of social borders, can support elaborations on processes of social division around racism, nationalism, and cultural differences in mathematics education with immigrant students. Thus, in the following chapters, there are further discussions on inclusion and mathematics education.

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[65] See more in: https://g1.globo.com/sp/sao-paulo/noticia/2019/01/15/policia-prende-4-bolivianos-suspeitos-de-manter-mais-de-30-conterraneos-em-regime-similar-a-escravidao-em-sp.ghtml accessed in 25th June 2020.

[66] Translated from Carneiro (2018b): “Sim [..], vejo que sempre organizam viagens, organizam passeios com os alunos europeus, mas não conosco” (p.27).

[67] Translated from Carneiro (2018b): “nunca imaginei que houvesse tanta discriminação entre brancos e negros. No meu país não se discrimina tanto por isso. Isso me impactou muito. Isso mudou a ideia que eu tinha sobre o Brasil” (p.27)

[68] See further discussions about We-Other dichotomy in Chapter 4.

4 INCLUSIVE MATHEMATICS EDUCATION WITH IMMIGRANTS

Some argue that values, ethics, and morality should be taught at home rather than at school. But I disagree, it's not right to learn about love and respect at home and live in a classroom where you face racism and bigotry.
D'Ambrosio[69]

As indicated in the previous chapters, critical mathematics education expresses concern about society, students, and learning environments. The research context of this dissertation within the field of critical mathematics education was set within these previous chapters. In this chapter, I will outline discussions on the ways in which learning environments interact with immigration and diversity, mediating them with the ideas and assumptions of inclusive mathematics education.

To reflect on diversity and inclusion within education, one must consider the different processes—with very different social implications—that mathematics education can embody. There is seemingly no unidirectional perspective about inclusion/exclusion relationships in mathematics education (Figueiras; Healy; Skovsmose, 2016; Kollosche; Marcone; Knigge; Penteado; Skovsmose, 2019; Martin, 2019). These varying approaches are intertwined with social markers of difference—sexuality/gender, age/generation, economic, cognitive differences, physical differences, and more—and produce distinctively privileged social statuses for certain groups.

Mathematics education has the tendency to replicate the same inequities and social divisions/borders that exist in the wider society, such as poverty and racism (Skovsmose, 2023; Martin, 2009; Gutiérrez, 2013). The brutal processes of worldwide colonisation and Eurocentrism throughout history became an integral part mathematics and mathematics education (Powell; Frankenstein, 1997; Skovsmose, 2021; Greer; Mukhopadhyay, 2012).

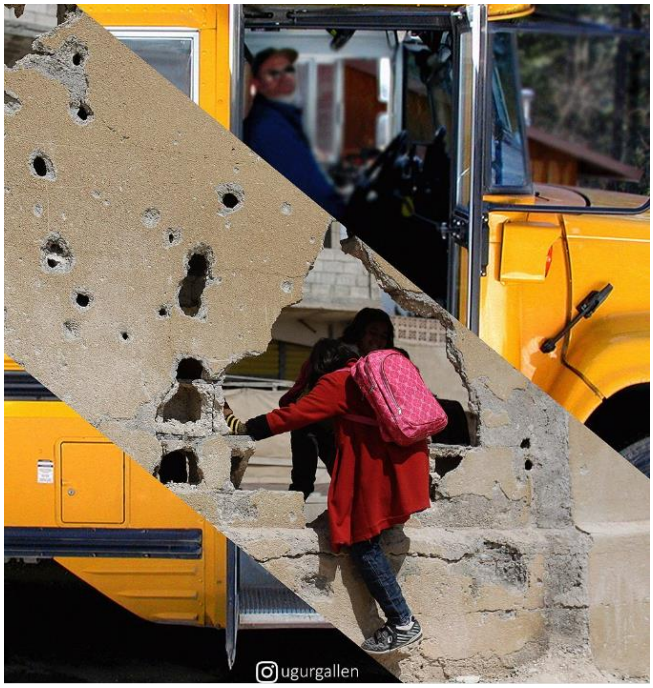
Radakovic and Limin (2020) point out aspects related to borders in teaching and learning mathematics. Borders are explored in many different contexts: borders between research and practice, borders between mathematics and other disciplines, and borders between

[69] From the original: "Alguns argumentam que valores, ética, e moralidade devem ser ensinados em casa e não na escola. Mas eu discordo, não está certo aprender sobre amor e respeito em casa e viver numa sala de aula onde se enfrenta o racismo e a intolerância" (D'Ambrosio, 2015, p. 3).

different demographic and cultural groups of students. Social borders in mathematics are related to social markers of difference and, consequently, to social exclusion. Mathematics can play a role in establishing and justifying borders as social dividers and also in creating new or amplifying existing injustices (Pais; Valero, 2012). In this sense, it follows that mathematics can also play a role in addressing structural racism and xenophobia.

Under the term 'exclusion', one example is structural discrimination and racism[70] within an educational system[71]. Racialisation in mathematics education arises through race discourses, which set the groundwork for structuring pedagogical practices around the reality of difference and dividing the group of students according to mathematics abilities along racial lines. Through dehumanisation of the "other", mathematics is constructed as an impossible field of knowledge for a group of "other" students (Valoyes-Chávez, Montecino; Guzmánc, 2021). Such a dynamic leads to a bordered land in mathematics education, which provides a "bordered" reality of social injustices.

Figure 13: Inequality at School



Source: Uğur Gallenkuş

Furthermore, immigrants are equally no not welcome in their host countries, since they are perceived through the lens of racially dominant discrimination. In this scenario, as people

[70] See more about racism and immigration in Chapter 2.
[71] See more in: https://www.irishtimes.com/news/social-affairs/traveller-children-feel-unwanted-in-education-system-says-report-1.4685032

move out of their home countries, mathematics education may turn into a weapon to relegate immigrants to second-class citizenship (Valoyes-Chávez; Montecino; Guzmánc, 2021).

Intersectionality[72] offers debate about those social markers that shape social inequalities. It can address complexities of social and political realities, and expose multiple forms of injustice rooted in their simultaneous engagement with multiple power relations (Crenshaw, 1989; 1991; Collins, 2015; 2016). Thus, it can be used to support thinking differently about how forms of oppression operate within and through mathematics education (Bullock, 2018).

Research on immigrants examines the intersections with language, and there are consistent themes that further focus on the intersections with race in the mathematical identity development (Civil, 2012; Zavala, 2014). I consider in this study the intersectionality related mutually to immigration, racism inclusion, and mathematics education to present the theoretical foundations that will support the discussion about inclusive mathematics education with immigrant students, creating space to debate further (in the analysis chapters) the possibilities for mathematical learning environments.

In the first section of this chapter, I address discussions about the We-Other dichotomy, structured along intersectional lines of social markers of differences and the difficulties they pose for inclusion. Following this, I address inclusion being a contested concept. Next, I consider for intersection of four aspects of education: education for all; antiracist education; liberatory education; and meetings amongst differences. Finally, I discuss how such perspectives of education can help to stabilise our understanding of inclusion, extending the borders of academic mathematics to inclusive mathematics education with immigrant students.

4.1 We-Other dichotomy as a border

Discourses that render people invisible, that consider some people “disposable”, are intertwined with the *We–Other dichotomy*[73]. This dichotomising has to do with bordering and polarisation, in the sense that groups of people are viewed on a scale of higher or lower importance. This importance is grounded in power structures, reinforcing the separation according to acceptance of “We” and rejection of “Other”. As a way of life, the "Other" must be downgraded just as much as the "We" is promoted (Leacock, 1977).

[72] Intersectionality refers to ways of understanding how many types of oppression and dominance—such as sexism, racism, patriarchy, ableism, and class discrimination—interact with one another in order to produce and perpetuate social inequities. See more about intersectionality in Chapter 2.

[73] I was inspired by the *We-They* dichotomy by Leacock (1977) to think more deeply about the *We–Other* dichotomy.

Figure 14: We-Other dichotomy

Source: Uğur Gallenkuş

Bauman (1991) writes that the “Other” concept concerns binary opposites or notions of difference. He writes:

> Abnormality is the other of the norm, deviation the other of law-abiding, illness the other of health, barbarity the other of civilization, animal the other of the human, woman the other of man, stranger the other the native, enemy the other of friend, ‘them’ the other of ‘us’, insanity the other of reason, foreigner the other of state subject, lay public the other of the expert (p. 14).

Such dichotomy can be observed in ancient social organisations. For example, the word "barbarian", which comes from the Greek word βάρβαρος and means "non-Greek", was used throughout history to designate people who did not share their customs and culture. The barbarian is the hallmark of “Othering” in the Ancient World. They were the foreigners, the immigrants, the “Other”. The unrecognisable strangers were considered members of an inferior civilisation, or savages[74].

We–Other dichotomies permeate the racialised social structures consolidated throughout history. Race is socially constructed as a way of describing “Others”, establishing borders between "We" and "Others”, and limiting spaces that can be accessed (Mbembe, 2018). According to Todorov (1993), the Great Navigations of the 15th century made it possible for

[74] https://brewminate.com/barbarians-othering-in-the-ancient-world/

different peoples to encounter one another, contributing to the need to discuss human diversity, so that they could reclassify and redefine what was—and who would be part of—humanity. Consequently, racism[75] was presented as necessary, since it could legitimise the submission and marginalisation of particular groups of people.

In this sense, I see the division patterns between *We–Other* as being structured along intersectional lines of social markers of differences, like those related to race, nationalism and cultural differences, for instance. Segundo Akotirene (2019) states that intersectionality highlights systemic discrimination in Brazil and acts of violence directed at indigenous peoples, immigrants, women, blacks, *Candomblé* religious, and diverse identity groups. The modern global standard has imposed these human allegories as "Others". They are distinguished via differences like colour, generation, and physical ability – and discriminated against due to prejudices that arose in that perfect system of oppression.

Increased mobility exists alongside fears of immigrants who pose challenges and are represented as a danger to host nations worldwide (Rodriguez, 2018). They are perceived as foreigners, outsiders, or clandestine—words that denote the understanding that people on the move are an abnormality. People who transit are therefore the "out of place", the uprooted, the unknown, the "Other". In this sense, We–Other dichotomy shapes immigrants' lives in a spectrum, with the *desirable* and *unwanted* statuses in the extremes[76]. This spectrum determines what kind of borders[77] they might face and the challenge of being part of a community in the host country. In other words, this dichotomising is related to how immigrants' positions in society are set: based on categorisations and ongoing redefinitions to distinguish them, by *belonging to* and *distancing from*.

In Brazil, the We–Other dichotomy remains strong in social structures. In 1997, for instance, a 44-year-old indigenous man of the Pataxó tribe, Galdino Jesus dos Santos, was doused with gasoline after falling asleep at a bus stop, and set on fire by five white men. The men's excuses were: "It was just a prank" and "We thought he was homeless". Figure 15 shows the monument raised in honour of Galdino and reminds us of the historical roots of black and indigenous peoples marked by ideologies of exploitation and annihilation.

[75] See more about racism and dehumanisation in Chapter 2.
[76] See more about desirable and unwanted immigrants in Chapter 3.
[77] See more about borders in Chapter 3.

Figure 15: Monument to Galdino

Source: Ed Alves/CB/D.A Press[78]

Ideologies based on the We–Other dichotomy can reduce people to mere objects and reinforce what Freire (2000b, 200c) calls *desgentificadas* (dehumanised) attitudes. The indigenous Galdino is an example of a person who was *desgentificada*, considered "disposable" and invisibilised. This dynamic might intersect with the reality of immigrant people living in Brazil and the exclusions they might face as under-considered and unwanted. Freire emphasises that any discrimination is immoral and fighting it is the duty of education in need for indignation in situations in which people are *desgentificadas*.

We–Other is embedded in the structure of education (Leacock, 1977), and such a dichotomy may be strengthened through mathematics, which makes it crucial to understand this dynamic when considering the inclusion of immigrant students in mathematics education. Challenging the *status quo* regarding mathematics education in diverse environments requires questioning the imposed borders and moving towards inclusive practices in mathematics education (Bishop; Tan; Barkatsas, 2015).

Mathematics can be used to divide, to create borders, to reinforce redefinitions about who the "Others" are and what they tend to do. It may set borders and function as a gatekeeper, supporting the division between those who can gain access to the Earth's resources and make decisions in society (Skovsmose, 2005). It might help, for example, to build cost-benefit numbers to support a "level of importance" of particular groups of people. According to Skovsmose (2020a):

> Social exclusion can take the most brutal forms being based on violent discourses integrating racism, sexism, and hostility toward "foreigners"

[78] https://www.correiobraziliense.com.br/opiniao/2022/04/5002872-artigo-honraria-vergonhosa.html

> or "immigrants." Such discourses might label groups of people as being "disposable," "a burden," or "nonproductive," given the economic order of today. It is a concern of critical mathematics education to address any form of social exclusion (p. 157).

Souza-Carneiro (2021) discusses valuation in her studies—the act of attributing value to something or someone—and particularly focuses on value in relation to people's lives, such as in calculating compensation for loss of life. The mathematical calculations in determining the value of a death claim can begin with deducing what people would be able to produce during the remainder of their lives. Her study indicates that mathematics can be brutally used to serve ideologies interested in defining which lives matter most. This is in line with Skovsmose (2021), who states that:

> […] younger people will become more valuable than elderly people; people with more education will be allocated more value than people with less education; healthy people will get more value than people with serious disabilities; and people from some nationalities will be more valuable than people from other nationalities (p.13).

Mathematics education can be a tool to prepare groups of people for the role of "being disposable". This occurs through various modes of social borders and exclusions from learning opportunities. For Skovsmose (2011; 2014; 2019), failing in mathematics, for example, might be part of labelling people as disposable. Some factors can contribute to differences in opportunities and learning in mathematics education. They might influence mathematics interest, confidence, and achievement. They might influence people's foregrounds and dreams[79] and, therefore, their dispositions and motives for learning.

The We–Other dichotomy is one of borders when it comes to inclusive mathematics education with immigrant students, since being regarded as part of a group or not is a fundamental part of the immigration process. Skovsmose, Moura, and Carrijo (2023) presuppose deconstruction of the We–Other dichotomy through mathematics education. The oppression present in the school environment can put distance between people and must be addressed through mathematics education. Given its critical nature (Skovsmose, 2020-a), mathematics education can be a weapon for confronting and erasing the We–Other dichotomy that has arisen due to global issues and diversity (accentuated by worldwide immigration). The existence of such a dichotomy necessitates that we work towards inclusion.

[79] See more about foregrounds in Skovsmose (2014b), Soares (2022) and Biotto Filho (2015).

4.2 Inclusion in what? Whose inclusion?

Inclusion is a contested concept; this word can be used in many discourses and with various approaches to interpretation (Figueiras; Healy; Skovsmose, 2016). According to Skovsmose (2019), "Inclusion means inclusion of some groups into some order of things" (p.74). No one can say for certain what actually is or is not an inclusive action, since this is not inherent to the word's sense; rather, the meaning arises according to the context in which the word is used, including the social context. Different understandings of inclusion can be involved in questionable standards and frameworks and in controversial discourses represented by various political, religious, and cultural issues. Therefore, the contested nature of the word 'inclusion' makes it essential to explain what we refer to when discussing inclusion: whose inclusion? And inclusion in what? This is particularly relevant (for my purposes) to inclusive mathematics education.

An interpretation of inclusion for inclusive mathematics education focuses on students with disabilities, including students with visual impairments, deaf students, students with autism spectrum disorder, and so on. For students with a medical report referring to special needs, there is an effort to include mathematics education in the direction of measures taken regarding the organisation of time, lesson plans, and forms of treatment in order to consider the specificities of each one (Kollosche; Marcone; Knigge; Penteado; Skovsmose, 2019).

However, other studies have linked the aspirations of inclusive mathematics education with the concerns of critical mathematics education (Moura, 2020). According to Skovsmose (2019), a broader approach to inclusive mathematics education is possible considering issues related, for example, to including students with differences in culture, gender, economic background, religious origin, race, age, or aesthetic. This includes low-income people, immigrants, LGBTQIAPN+ communities, and many other groups of people. In this sense, inclusion expresses consideration for all groups of students who have historically been marginalised and excluded from educational opportunities.

Brazil, for example, due to its continental dimensions, geoclimatic variety and socio-historical formation, has a large diversity of peoples. Indigenous peoples, *quilombolas*, forest peoples (*florestania*), riverine people (*caiçaras),* and rural populations, as well as immigrants from northern to southern Brazil are all example groups of people who can benefit from a broader approach to inclusive mathematics education.

When considering the mathematical inclusion of immigrant students, asking what inclusion refers to can generate answers that open up multiple perspectives. This is because talking about inclusive mathematics education with immigrant students leads us to an

intersectional approach regarding the We-Other dichotomy. This intersectional view helps in understanding contested perspectives of inclusion.

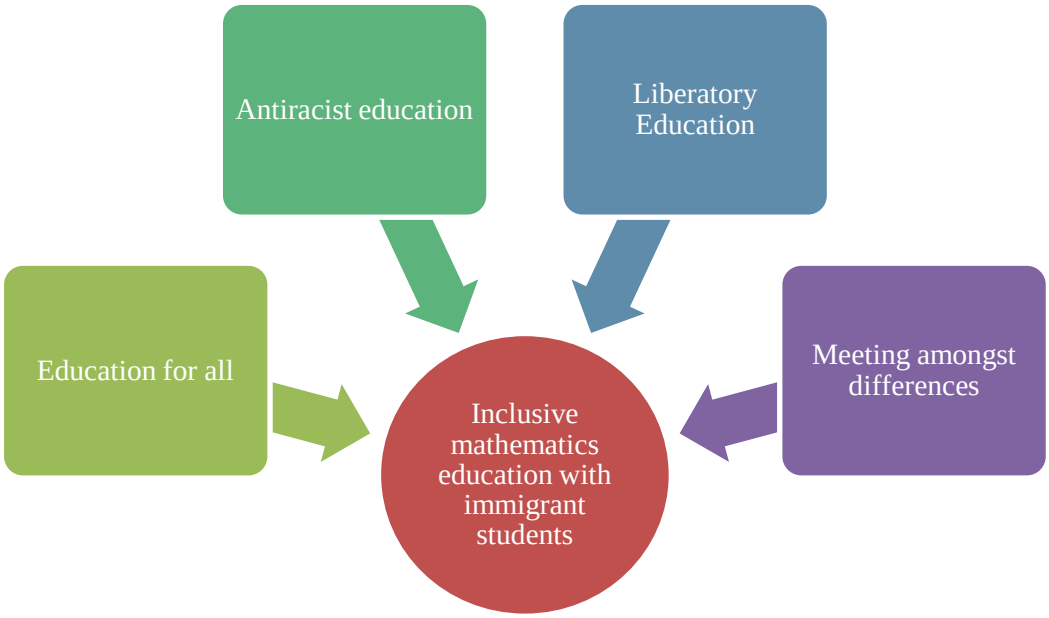
According to Martin, Price and Moore (2019), mainstream mathematics education's oppressive nature has put inclusion in service to political projects such as nationalism, xenophobia, militarism, and racial capitalism, as well as obscuring the complexity of the racialised system. Mainstream perspectives of inclusion are based on the subordination of people in the sense of annulling themselves in order to be accepted in other contexts, in a dimension that understands people as *degentificadas* who need to be assimilated into a way of being in the world.

A social scenario that illustrates diversity being intensified by immigration raises challenges for inclusive mathematics education. Thus, it is necessary to discuss what inclusion refers to in this study. I talk about the inclusion of immigrant people under an expanded approach to inclusive mathematics education. In the following, I present theoretical elements that guide what inclusion could mean for this study.

4.3 Inclusive mathematics education through intersectionality

Inclusion with immigrant students can be a transformative concept. I see inclusive mathematics education with immigrant students as a concept within a kind of “theoretical support network”. Thus, it seeks support from other theoretical discussions in education to establish its space of possibilities. Different aspects of education need to be intersectionally coordinated when thinking about inclusion. In this doctoral dissertation, I consider the intersection of four aspects of education: education for all; antiracist education; liberatory education; and meetings amongst differences. Figure 16 represents a dynamic in which mathematics education with immigrant students can feed on other theoretical perspectives of education to support its concept of inclusion. Below, I discuss each of these perspectives.

Figure 16: Inclusive mathematics education with immigrant students



Source: Produced by the author.

4.3.1 Education for all students

One must consider all groups of students in order to discuss inclusion in education. Education does not only mean schooling, but also actions of permanence and removing borders to welcome students as they learn.

The Brazilian Federal Constitution of 1988 (Brasil, 1988) supports foundations that deal with the right of all people to education and schooling. This right is established and aligned with international agreements, such as the World Declaration on Education for All (UNESCO, 1990). Thus, in the documents, immigrants and non-immigrants are equated in the guarantee of—and right to exercise—fundamental rights, such as the right to enrolment for all immigrant students, whether they are in good standing or not. Although legislation protects the rights of all people, without any distinction, to access schools, simply having access to school does not guarantee inclusion.

Education for all is a perspective that often addresses notions of general universality, which cover Eurocentric particularities (Martin; Price; Moore, 2019). It can also be employed for problematic purposes, as criticised by Padilha and Oliveira (2013):

> Mostly, the perspective of education for all follows a neoliberal orientation, which focuses on the expansion of markets, materializes in

> reparative social policies, and obscures the class contradictions that are at the base of the capitalist production model (p. 182).[80]

In addition, "mathematics for all" discussions ignore the social and structural inequalities failing to address the student's educational needs (Valero, 2017). It can also be a mechanism of racialised social systems producing contradictory acts of inclusion and exclusion and segregating those for whom mathematics is not a possibility (Martin, 2019; Valoyes-Chavez; Andrade-Molina, 2022).

Nevertheless, I am not referring to *education for all* as just the general universality of school education. Nor am I referring to an education that follows neoliberal orientations of mass labour training, where everyone can participate in and be exploited by the capitalist production chain.

On the other hand, I am referring to a perspective of *education for all* with two characteristics: firstly, education for all aims for school access and permanence for everyone and effectively inclusive environments, centred on respect and appreciation of differences (UNESCO, 1990; Padilha; Oliveira, 2013). Secondly, education for all aims at education for all types of students in the sense that everyone can (and needs to) study social issues related to social injustices of all student groups (Skovsmose, 2023).

Regarding the first characteristic, I consider Barros's "ideal of inclusive education" (2017) based on the principle of *education for all*. Barros (2017) focuses on inclusion of deaf students in mathematics classes, and claims that simply giving students access to school does not mean that there is inclusion. Students can share the school space, but there is isolation and exclusion, meaning "being inside" differs from "being part of". He addresses attention to an inclusive education that considers all students without the need for any adaptations or simplification of content for everyone to learn. Through the value of autonomy and respect for differences, each one with its specificities and individualities coexists in the same space for teaching and learning mathematics.

On the second characteristic, according to Skovmsose (2023),

> Addressing cases of social injustice is not only important for students suffering such injustice. Addressing the consequences of poverty is not only important for students living in poor neighbourhoods. Addressing cases of racism is not only important for students subjected to racism. Addressing consequences of pollution is not only important for students living in polluted neighbourhoods. Such issues are important for all groups of students (p. 2004-2005).

[80] Translated from: Majoritariamente, a perspectiva da educação para todos segue uma orientação neoliberal, que tem como foco a expansão dos mercados, materializa-se em políticas sociais reparadoras e obscurece as contradições de classe que estão na base do modelo de produção capitalista (Padilha; Oliveira, 2013, p. 182).

In this sense, every type of student needs to develop a more profound conception of the problems associated with social injustices related to any social border and start participating in a broader discussion about what social justice can mean. Likewise, addressing cases of xenophobia is not just crucial for immigrant students.

Each student matters in the process of teaching and learning mathematics. In addition, the foundations of inclusion of immigrant students might be the promotion of mathematical learning opportunities for all students and on the fact that no particular group of students is privileged.

4.3.2 Antiracist mathematics education

In a racist society, it is not enough to not be racist.
It is necessary to be anti-racist.
(Angela Davis)

In Brazil, Laws 10.639/2003 and 1.645/08 (Brasil, 2003; 2008) are essential milestones in developing anti-racist pedagogical practices. They make it mandatory to include, in the official curriculum of schools, the teaching of Afro-Brazilian and indigenous history and culture (Brasil, 2003). Both laws contribute to the historical process of struggles to break away from systematic racism that has produced the erasure of the histories of Africans, Afro-Brazilians and indigenous people who were *desgentificadas* (dehumanised) and made invisible from the school context.

Social transformation actions involve breaking with normalities built over more than 300 years of slavery that reproduced a colonialist and assimilationist value system resulting from erasing African, Afro-Brazilian and indigenous references (epistemicide)[81]. Anti-racist thinking intervention is necessary in education, to lead us towards anti-racist actions and reparation measures (Ribeiro, 2019).

Within mathematical education, racial biases and inequities can manifest in various ways, such as through curriculum choices, teaching practices, assessment methods, and educational policies (Martin, 2009; Silva; Powell, 2016; Valoyes-Chávez, 2018; Valoyes-

[81] "Denying Blacks, the status of subjects of knowledge, by devaluing, denying, or hiding the contributions of the African continent and the African diaspora to the cultural heritage of humanity; by imposing cultural whitening and by producing failure and dropping out of school. We call these processes epistemicide". Translated from: "Negar ao negro a condição de sujeito do conhecimento, desvalorizando, negando ou ocultando as contribuições do continente africano e da diáspora africana ao patrimônio cultural da humanidade; impondo o embranquecimento cultural e produzindo reprovação e evasão escolar. Chamamos esses processos de epistemicídio" (Carneiro, 2005, p. 324).

Chavez; Andrade-Molina, 2022). This leads us to the perception that it is not enough for mathematics education to take a stand against racism and xenophobia. Mathematics education must be anti-racist. In other words, mathematics must be used as a window that looks out onto social justice issues around racism and immigration to address and challenge systemic racism and inequalities within the field of mathematics.

On a decolonised and anti-racist mathematics education, Moore and Price (2015) claim:

> Critical Antiracist Mathematics is counter-hegemonic and does not approach mathematical teaching and learning from the idea of one master-narrative or universal truth. Instead, it recognizes multiple truths and narratives and explicitly names the racism that often serves as barriers for marginalized people to participate in the knowledge production process (p. 816).

As difference based on race—racial difference—is fabricated in mathematics education within the context of transnational mobility (Valoyes-Chávez; Montecino; Guzmánc, 2021), awareness about how mathematics is racialised is essential to recognise and challenge salient borders around mathematics education with immigrant students. Some mathematics education studies have examined the intersections of racism and learning mathematics with Latinos (Gutiérrez, 2012; Gutstein, 2003).

Awareness about how mathematics is racialised in a system of pigmentocracy is also needed. The system of pigmentocracy[82], as in Brazil, operationalises the intersections of race and class in education. Pigmentocracy manifests in education as the dual system of prestige versus stereotype, where white and lighter-skinned groups have been able to secure and maintain disproportionate access and position of prestige (Rampersad, 2012).

Furthermore, for anti-racist mathematics education in a system of pigmentocracy, I consider the use of the Critical Race Theory (CRT) crucial. CRT is fundamentally concerned with the structures and relations that uphold racial inequality. It concerns how racialised dominant society reinforces different minoritised groups and supports hegemonic arguments of racial superiority and inferiority (Kalwant; Preston, 2012; Rollock; Gillborn, 2011). Such lenses can provide interpretations for the widespread nature of race and the processes of racialisation in educational settings, highlighting and examining the role of racism in students' daily lives, in the classroom, and across the educational system (Ladson-Billings; Tate, 1995; Martin, 2012).

[82] See more about pigmentocracy in Brazil in Chapter 2

Through an antiracist perspective, mathematical education questions Eurocentric epistemological postures and assimilationists, and is aligned with the learning process that questions the social structures and their basic assumptions. It does not seek prejudice reduction on an individual level, but rather to dismantle systems of oppression through collective action and produce activists against social injustice.

Mathematics can function as a principal instrument for identifying and documenting cases of structural racism, as well as of other forms of structural violence (Skovmose, 2023). Anti-racist mathematics, which is aligned with critical mathematics education and acknowledges cultural and social contexts, provides opportunities to critically analyse and question the ways in which mathematics has been historically used to perpetuate racial and social inequalities. It is crucial to coordinate this with thinking about the inclusion of immigrant students.

4.3.3 Liberatory education

According to Freire (2000b), people produce knowledge to humanise themselves. He refers to the educational practice as an experience in humanisation, and it must be impregnated with the practice of freedom, which moves us and makes us take risks. In this sense, education is against domestication and the discipline of silence. He says:

> Education as the practice of freedom—as opposed to education as the practice of domination—denies that man is abstract, isolated, independent, and unattached to the world; it also denies that the world exists as a reality apart from people. Authentic reflection considers neither abstract man nor the world without people, but people in their relations with the world (Freire, 2000, p. 81).

In this sense, he discusses liberatory alternatives for education. The liberatory process can serve as a window and a route for students to recognise their conditions and imagine a better future. Studying a lack of freedom makes it possible to learn how to become free. Liberatory classes reveal people's conditions and help students overcome them, providing a critical distance from society instead of an uncritical immersion in the *status quo*, to think about changing it. Through critical dialogue about a moment in society, this means the possibility for the students to see their own conditions and envision a different destiny (Shor; Freire, 1987).

Liberatory education involves revealing and unveiling the reality, seeing its reasons for being like this and understanding the political and historical context. Liberatory education gives respect for freedom, a testimony to democracy, and the virtue of living with and respecting

differences (Freire, 1987, 2000-b). In this field of possibilities, one can act for freedom, imagining schemes to cross social borders and transgress in engaged education with a view to emancipation (Hooks, 2013).

Martin, Price and Moore (2019) address a liberatory education in mathematics education as a possibility contrary to the dehumanising and violent forms of education. They draw attention to contexts outside the classroom and their systems of domination, especially those related to racism. They reinforce a liberatory education that rejects a system of structural exclusion and, therefore, claims intense social transformation.

Lima (2022) claims that creative insubordination seems to be a path to inclusive actions and social justice in mathematics classes. Her studies show that it is possible to imagine mathematics classes from an inclusive perspective in approaching creatively insubordinate actions.

One can claim that creative insubordination and responsible subversion are related. Creative insubordination and responsible subversion are characterised by actions that violate the rules in the process of uncovering gaps in policy or interpreting rules and procedures, allowing them to protect historically underserved and/or marginalised students. It deals with the constant search for breaking and overcoming paradigms through reflective actions (Gutierrez, 2013; D'Ambrosio, 2015). This act of breaking paradigms is a political one, and is compared to breaking out of a cage (D'Ambrosio; Lopes, 2015).

Creative insubordination and responsible subversion seem to align with the foundations of a liberal education for intense social transformation. The fostering of freedom contributes to the creation of inclusive actions for the recognition of subaltern groups. It seems to be another step for inclusive action and social justice in mathematics classes with immigrant students.

4.3.4 Meetings amongst differences

Critical mathematics education establishes learning as a process of interaction through *meetings amongst students and teachers* with aspirations, ambitions, frustrations, worries, and intentions. It is a meeting between people with different foregrounds, in complex life-worlds (Skovsmose, 2023; 2019; 2016).

Skovsmose (2019) addresses inclusive practices in mathematics education as a need to reinterpret inclusive education as a type of education that tries to establish *meetings amongst differences*. This means meeting amongst different backgrounds and foregrounds. In mathematics classes, this would involve highlighting encounters between people with different

life experiences, cultural backgrounds, and different fulfilled and frustrated dreams, as well as with different hopes, priorities, opportunities, perspectives, and aspirations.

The *meeting amongst differences* is about welcoming differences and considering the contexts and knowledge that all students bring to the school. In this sense, differences are not *borders* but learning enhancers. Appreciation of all different knowledge and experiences enables learning opportunities.

Diverse patterns of interaction are possible, and dialogue, respect, and tolerance play crucial roles (Skovsmose, 2023; Moura, 2020; Faustino, 2018). First of all, without self-respect and mutual respect, the meeting at schools means no more than the assimilation of the socially discriminated against group into the dominant one or, in effect, the acceptance by the former of a subordinate status (Leacock, 1977). Furthermore, respect for diversity paves the way for us to consider and learn from each other.

Accordingly, for the UN (1995), education policies and programs must promote an understanding of solidarity and *tolerance* across ethnic, socioeconomic, cultural, religious, and linguistic groups within countries. For Freire (2017), tolerance is not a favour from the tolerant to the tolerated in the sense of superiority in terms of class, ethnicity, or gender. Tolerance, conversely, is a virtue of human coexistence, of living with those who are different rather than those who are inferior.

Moura (2020) and Faustino and Skovsmose (2020) acknowledge the importance of establishing dialogues across differences. Dialogues must be established among students and between students and teachers; dialogic interactions provide resources for critical activities.

I see *meetings amongst differences* as possibilities for inclusive practices in mathematics education that intend to overcome the We- Other dichotomy. They provide an opportunity for coming together across borders to foster collaboration, new knowledge, and ways of thinking. They are possibilities for meeting and building relationships between immigrant and non-immigrant students in inclusive environments.

4.4 Non-conclusive elaboration

In this chapter, I bring together educational concepts in an intersectional constellation. All these elements representing different education approaches make perfect sense when considering inclusion in mathematics education with immigrant students. These are some early elaborations on inclusive mathematics education with immigrant students. The development of this research brings more elements through the data produced, and further discussions will be made, going deeper into immigration issues.

Within the social sphere, there are well-maintained hierarchical structures that legitimise the oppression of racial minorities, and these cross the educational space. It is necessary to think about education critically so that social changes can be seen (Hooks, 2013). This has to do with the invisibility of immigrant students in educational systems. From this point of view, it is necessary to have mathematics education with a view to the inclusion of immigrant students that is based on a critical, anti-racist, and liberating perspective without losing sight of the *meeting amongst differences* of each and every student.

Such education acts to afford students the space to critique systems of oppression, develop critical consciousness, and develop tolerance; along these lines, it is essential to include immigrant people in the direction of overcoming relationships based on hatred of differences that trigger racism and xenophobia (for instance). In short, such elaboration in inclusive mathematics education seeks to overcome the We–Other dichotomy, fostering a feeling of belonging, not as uniformity and conformation but as liberation for critical social transformation. Above all, this means going towards inclusive mathematics education that prevents groups of immigrant students from being “invisible shipwrecks” in mathematics classrooms.

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SECTION B- METHODOLOGY AND DATA PRODUCTION

In this section, the methodology used in the research, the data production procedure, and the way in which data was organised and analysed will be highlighted. The bibliographic references used will appear at the end of the dissertation text, along with other references from other sections.

5 RESEARCH TRAJECTORY

This research has undergone changes since its beginning, which were briefly described in the first section of this doctoral dissertation. Concerns about working with immigrants were part of these transformations, and the motivation to reflect on racism and inclusion regarding this group was given by my personal trajectory and as a result of theoretical studies on the subject. Understanding immigration as a human right, which includes the right to education, is at the core of this research, which aims to understand the role of the mathematics teacher as a sociocultural and political agent in the face of the phenomenon of immigration. The methodological choices made to conduct the research are detailed in this chapter, including planning, reflections, and decisions made.

The central research question is: *What can inclusive mathematics education do in the context of international immigration shaped by social and racial structured injustices?* Some research aims that guide this study are:

- To highlight the importance, for mathematics education, of addressing some issues such as racism, citizenship, globalisation, ghettoisation, and so on concerning immigrant students.
- To stress the inclusive and anti-racism mathematics education field to going deeper in considering immigration issues.
- To outline practical possibilities for mathematics classes, taking inspiration from already carried out investigations, as well as imagined hypothetical situations.

This research starts from the premise that a research process is not neutral. It is pervaded by choices that express, explicitly or implicitly, the researcher's notions of knowledge production and the teaching and learning process, as well as the researcher's perceptions and interactions as a human being in the world. In this sense, the resonance between the conceptualisation of knowledge, the theoretical perspective and the pathways taken for the research is essential (Araújo; Borba, 2004; Bourdieu, 1983; Crotty, 1998).

Scientific exercises can never be considered apolitical; they produce and require a particular sort of interest. In a double determination, Bourdieu relates the scientific sphere to the society it is embedded in; thus, scientific knowledge is never politically immune. “The idea of a neutral science is a fiction[83]” (Bourdieu, 1983, p.148). This is in line with Freire's thinking when he asks: “What is my neutrality if not the comfortable way, perhaps, but hypocritical, of hiding my choice or fear of accusing injustice? Washing your hands in the face of oppression

[83] Translated from: A ideia de uma ciência neutra é uma ficção (Bourdieu, 1983, p.148).

is reinforcing the power of the oppressor; it is opting for him"[84] (Freire, 2017, p.70). Research in a critical paradigm is connected to transformations.

Thus, all decision-making for the development of this research is intrinsically related to the political and social context in which the researcher and the research participants find themselves. The research aims to expose / confront this context, inquiring about and analysing the social situation, in order to understand the changes needed and consider possibilities in mathematics education for engaging in social transformation that helps us overcome many kinds of borders and exploitation structures.

The following sections will outline the methodological assumptions that guided the research and data analysis procedures. The paths outlined throughout this inquiry to answer the central research questions will be explained while presenting the methodological approaches.

5.1 Crossing borders in research process

This research seeks to cross borders in the carrying-out process. In other words, this research can be conducted without following a single path or relying on established theoretical and methodological possibilities. This entails not categorising it into predetermined categories, in "predefined boxes".

Bourdieu proposes that when studying an object, the researcher should not be limited by methodological rules, arguing that a break with methodological monotheism is required. For him, doing science requires the following: "[...] avoid the appearances of scientificity, contradict even the norms in force and challenge the current criteria of scientific rigor[85]" (Bourdieu, 2002, p.42). According to Yosso (2015), the need to do research differently arises from the ethical and political problems and questions raised by traditional research methods. According to Bourdieu and Wacquant (1992):

> The long and the short of it is, social research is something much too serious and too difficult for us to allow ourselves to mistake scientific *rigidity*, which is the nemesis of intelligence and invention, for scientific *rigor*, and thus to deprive ourselves of this or that resources available in the full panoply of intellectual traditions of our discipline and of the sister disciplines of anthropology, economics, history, etc. In such matters, I would be tempted to say that only one rule applies: "it is forbidden to forbid," or, watch out for methodological watchdogs! (Bourdieu and Wacquant, 1992, p. 227, italics ours).

[84] Translated from: Que é mesmo a minha neutralidade senão a maneira cômoda, talvez, mas hipócrita, de esconder minha opção ou medo de acusar a injustiça? Lavar as mãos em face da opressão é reforçar o poder do opressor, é optar por ele (Freire, 2017, p.70).

[85] Translated from: [...] evitar as aparências da cientificidade, contradizer mesmo as normas em vigor e desafiar os critérios correntes do rigor científico (Bourdieu, 2002, p.42).

The methodological construction and reconstruction are essential for a research process that aims to attempt to overcome relations of subordination/domination in the intellectual field. This does not mean that freedom from methodology characterises an “anything goes” situation or that one should not have a consistent methodology of studying. There must be vigilance over theoretical freedom when rigorously constructing the object of study. Nevertheless, mastering methods and theories is not the same as being mastered by them.

With this research, I try not to follow a set formula. Instead, I draw on different influences to compose my own way of researching. It draws on inspirational methodologies and creative possibilities to compose my own way of researching. Furthermore, this position aims to align with the dissertation's basis discussions: to document and understand the meanings of oppression in the context of immigration and think about possibilities of transformation together with mathematics education. Discussing racism and xenophobia and all subsequent issues requires questioning the way we do research, questioning borders and restrictive mindsets that hinder science.

The notion of crossing borders aligns with D’Ambrosio’s notion of overcoming epistemological cages:

> The concept of epistemological cages, comparing specialists to birds living in a cage. Birds only see and feel what the bars allow, they only feed on what they find in the cage, they only fly in the space of the cage, they only communicate in a language known to them, they breed and reproduce in the cage. But they don't know what color the cage is painted on the outside (D’Ambrosio, 2016, p.224).

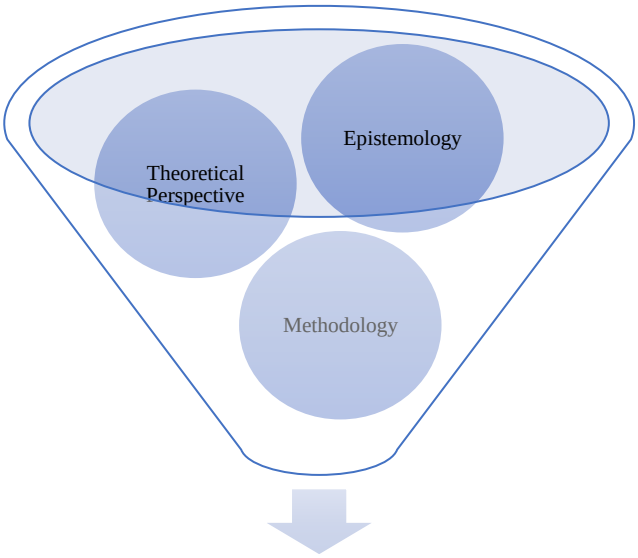
I do not advocate eliminating the borders/cages, since each research methodology has its own set of advantages. Furthermore, travelling beyond borders does not imply going to a place where there are no borders at all. However, for this research, it makes sense to walk freely through other rooms, and migrate to other places in research. The ability to see and understand natural and social reality and be inspired by new perspectives, creativity, and other ways of communication are all possibilities.

5.1.1 Outlining the methodology

In order to comprehend how this investigation was designed, one must first comprehend the epistemological approach that led to choosing this method and methodology. The process of knowing and of acquiring knowledge is conceived in a variety of ways and it has a direct impact on research procedures and data production. This refers to the relationship among

theoretical perspectives, *epistemology* and *method and methodology* approaches (Crotty, 1998). Figure 17 illustratively represents this perspective.

Figure 17: Paths to method



Source: Produced by the author

Epistemology studies the nature, origin, and limits of human knowledge production, including concerns about validity. By defining the epistemological assumptions, it is possible to establish the scientific method with methodological and technical resources that are coherent and relevant to the development of an investigation. Thus, I understand epistemology as a territory of dispute between different theorists, characterising itself as a place for theoretical reflection about the possibilities and limits of human knowledge production. Thus, there are defined borders between what is or is not thought to be the rightful and acceptable method of conducting research.

According to Alrø and Skovsmose (2004), a critical epistemology of knowledge production is concerned with integrating a judgement of what is learned into the learning process: it is an inherent component. “A critical epistemology is also searching for a competence in ‘separating wonders from horrors’, when mathematical thinking and techniques are addressed, considering issues of reliability and responsibility” (p.256). In this sense, this research is inspired by a critical epistemology of knowledge production, since knowledge is not understood outside its political, historical, and social context, outside human praxis and, therefore, its construction is guided by intentionality and transformations of human existence.

Furthermore, this research is inspired by the understanding of epistemology that positions science as a social and temporal product that goes beyond existing models and the rigidity of any explanatory model of social life (Bourdieu, 2004). There are many ways to do science, and scientists play a crucial role in society; it is up to them to develop new ways of understanding their institutions, their relationships, their way of life, their society and themselves, because "[…] all knowledge, and therefore all meaningful reality as such, is contingent upon human practices, being constructed in and out of interaction between human beings and their world, and developed and transmitted within an essentially social context" (Crotty, 1998, p.42).

For the *theoretical perspective*, this research is inspired by aspects of the Critical Inquiry (Crotty, 1998; Lather, 2004; Denzin, 2015) and Constructivist Grounded Theory (Charmaz, 2017; 2021). They both consider that a critical researcher may pursue a cause and intend to advocate in the public realm or to educate in the academic domain, which includes addressing power, inequality, and injustice as embedded in a transformative paradigm that seeks to expose, oppose, and redress forms of oppression. Moreover, certain groups in any society are privileged over others, constituting oppression that is most forceful when subordinates accept their social status as natural, necessary, or inevitable.

For *Critical Inquiry*, research means excavating hidden meanings and actions, identifying contradictions, examining purposes, policies, and practices, and evaluating the means and ends flowing from them. All thought is fundamentally socially and historically constituted, and facts can never be isolated from the domain of values or removed from ideologies. Invisible aspects of social structure and process provide a grist for critical inquiry. Taking a critical approach means situating the research in its social contexts and taking a critical stance to look at the structures of the participants' lives, as well as how hierarchies and resources shape their worlds, revealing their alignments with other aspects of the studied situation which can make hidden processes and structural arrangements visible.

For *Constructivist Grounded Theory*, the research goes through levels of analysis from individuals to the collective and from the local to the global. It reveals sites for change and activism, which means not only describing reality but also placing the voices of the oppressed at the centre of inquiry, proposing alternatives for transformation, and contributing to social justice. Oppression has many faces and concerns, and our lives are mediated by systems of inequity such as classism, racism, sexism, and heterosexism. Mainstream research practices are generally implicated, albeit often unwittingly, in the reproduction of systems of class, race, and

gender oppression; the relationship between concept and object—and between signifier and signified—is never stable and is often mediated by social relations.

As a contribution of *methodology*, this research is based on qualitative research, which means there is no concern with making generalisations or establishing laws, but instead it aims at deeper understanding of a social phenomenon (Bodgan; Biklen, 1982, Goldenberg, 2007). For Chizzotti (2006), qualitative research "does not have a single standard because they admit that reality is fluent and contradictory and the investigation processes also depend on the researcher—his conception, his values, his objectives (p. 26)[86]".

Qualitative research is not dichotomous to quantitative research, but complementary and necessary, to account for intense, complex, non-linear dynamics of reality (Demo, 2011). Such research is concerned with understanding the web of social, political, historical, and cultural relationships. "Qualitative research data aim at a deep understanding of certain social phenomena supported by the assumption of the greater relevance of the subjective aspect of social action" [87] (Goldenberg, 2004, p. 49).

5.1.2 Pedagogical Imagination

This research is about possibilities. This means that it is not based on a descriptive paradigm. The goal is not only to interpret what takes place, nor to concentrate on the current situation, but to study alternatives to this situation through *pedagogical imagination*. Such imagination has to do with the previously mentioned theoretical research perspective, which understands that the relationship between concept and object is never stable and is often mediated by social relations. A current situation is always in transformation and constant reformulation of concepts and imaginative possibilities.

According to Skovsmose and Borba (2004), by describing a current situation (CS), it is possible to highlight critical aspects and interpretations about various issues and challenges about the subject of the study. However, the current situation can be imagined to be different through an imagined situation (IS), which gives us possible alternatives. Considering the imagined situation, it is possible to think about the arranged situation (AS), which means a practical alternative.

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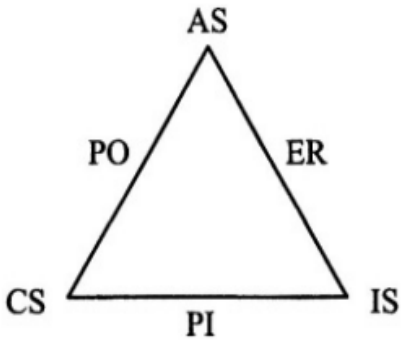
[86] Translated from: não tem um padrão único porque admitem que a realidade é fluente e contraditória e os processos de investigação dependem também do pesquisador – sua concepção, seus valores, seus objetivos Chizzotti (2006, p. 26).

[87] Translated from: Os dados da pesquisa qualitativa objetivam uma compreensão profunda de certos fenômenos sociais apoiados no pressuposto da maior relevância do aspecto subjetivo da ação social (Goldenberg, 2004, p. 49).

The relationship between current and imagined situations is the subject of pedagogical imagination (PI). Through pedagogical imagination, it is possible to create the imagined hypothetical situation as an alternative to the current situation (CS) by creating imagined circumstances. The relationship between the current situation and the arranged situation is established by planning action as is necessary to establish a situation by a practical organisation (PO). Finally, explorative reasoning (ER) means the analytic process of reconsidering the imagined situation in light of experiences related to the arranged situation.

Figure 18: Pedagogical imagination in critical research



Source: Skovsmose and Borba (2004)

This research works on the base of the triangle (the CS and IS line, Figure 18), linking theoretical frameworks and practices associated with imagined hypothetical situations. Pedagogical imagination has the current situation as a point of departure going via creative and thoughtful situations into a critical perspective (Skovsmose; Borba, 2004; Vithal, 2003; Skovsmose, 2009). “The imagined situation exists only as a conception established by different hypotheses and ideas. It is partial and fluctuating […] It also deals with what is not the case but could be brought about” (Skovsmose; Borba, 2004, p.2015).

Lima (2022), working with pre-service mathematics teachers, argues that pedagogical imagination is an opportunity to think about issues in teaching mathematics inclusively. Within teacher training, pedagogical imagination stimulates creativity and offers an opening to think about the possibilities of overcoming borders within lesson plans. It involved imagining the school, the classes, and the students.

Throughout this research, alternatives to the current educational situation will be imagined by considering the inclusion of immigrant students. Through this research, imagined hypothetical situations will be created, trying to provide possibilities of an inclusive space in

which students and teachers can understand reality and challenge the current situation of exclusion and injustices through mathematics.

In summary, this research has everything to do with the methodology that deals with the conception of the world, science and, therefore, education. This involves thinking of alternatives for a formal and established way of researching. This is because pedagogical imagination is not only based on the conception of the world that one has, but also on the conception of the world that can be created, by exploring what is not there and what is not current. “By 'investigating alternatives' we don't simply mean 'suggesting alternatives' […] but pointing out that something could be different. The statement 'something could be different' refers to what is considered a given and what is investigated as a possibility” (Skovsmose; Borba, 2004, p.211).

This research aims *to understand how exclusions and social injustices reflect on the context of mathematics classes and how they can be inclusive environments for immigrant students.* Understanding why and how something could be different is the basis of generating ideas in transformation and creating other knowledge. For this research, the transformation is in the mathematics classroom and the social scenery in general. Both contexts are intertwined.

In this sense, this study evolved in an attempt to find methodological and theoretical consistency between how to research and what is researched, illuminating both research practices and discussions in mathematics education. Imagination can be related to expectation and hope based on a theoretical framework that can be reformed or transformed.

5.2 Data production: Building windows to see beyond

One can consider the data of this research as a window, through which it is possible to see further. This metaphor will be used to better express the role that data plays in this research: to reveal many critical aspects of the current situation. When talking about the window, it only describes the window. It is necessary to go further and about what we see through the windows. For this research, we see the living conditions of immigrants through the participants’ reports.

Figure 19: Building windows to see beyond

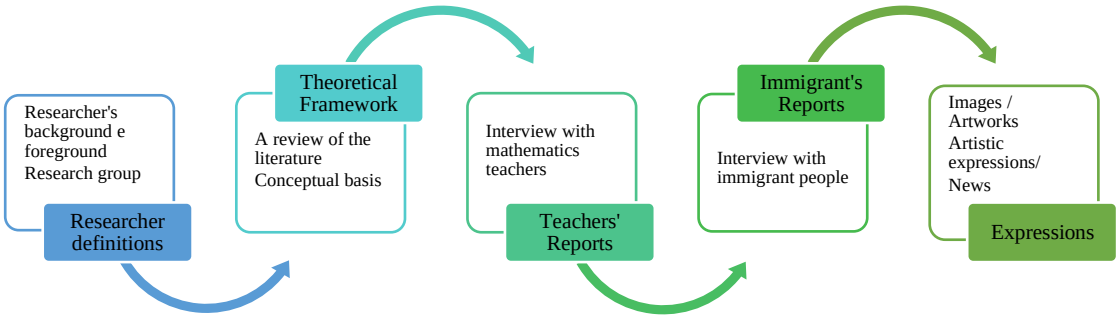
Source: https://vpconsultoriaimobiliaria.com.br/morar-no-interior/

However, the window metaphor should not be confused with the lens/glass metaphor. Theoretical lenses can be appropriate for data analysis since they allow a theoretical look at the object of study when theoretical intertwining and reflections are made towards the research questions.

In this research, the object of study is the social scenario for which the data opens windows. This research does not seek to understand a particular group of people or a mathematics classroom at a particular school; hence, it will not only analyse the data itself but will go beyond or through it. The goal is to understand a social scenario and the potential for mathematics education through the data. Unlike other research in which empirical data plays a significant role, the data is not the core of this research. However, it is not secondary either; it is highly relevant to the theoretical discussions.

As a result, data production is analogous to the construction of windows. It is through data that an in-depth theoretical discussion is possible. Without this window, the social reality could get obfuscated, causing the theoretical discussion to devolve into assumption-laden arguments. The construction of these windows (data) was carried out by going through the stages represented in the illustration below:

Figure 20: Data production process



Source: Produced by the author

This construction begins with the ideation of the research, passing through all the methodology choices: *researcher definitions, theoretical framework, reports,* and *expression resources* (Figure20). All such choices to structure the research are represented in the production of data, defining its systematic constitution through a process with different nuances. Thus, the illustration above shows a colour gradient to illustrate that each layer in the data production can present itself in different intensities.

With *researcher definitions*, the researcher (through their research choices and theoretical foundation) defines the framework through which the discussion about the social scenario will be made. Elements of its background and foreground are constitutive elements of the data (windows) through which the researcher looks at a given scenario. A researcher with little or no experience of the researched scenario, for example, may have to deal with severe opacities in the window, since their background and foreground constitute the material of this data and influence their translucency. Also, the researcher's perspective and subjectivity produce a ‘narrative’ about what has taken place (Skovsmose; Borba, 2004).

Through the *theoretical framework*, several scholars' and researchers' voices help compose the description of the social scene. They provide essential foundations for the constitution of the data. Constructing a window without a theoretical foundation which is a fusion of all their elements is impossible.

Through the *reports*, teachers who teach mathematics to immigrants can open “windows”, making it possible to discuss and understand a social scenario, as well as to consider injustice and social inequalities (Yosso, 2005). Each participant presents a different window, through which we can see and analyse the scenario from their point of view. Their reports are essential elements for seeing beyond and fundamental for understanding the object studied (Triviños,1987; Lüdke; André, 1986).

The *expression resources*—news from newspapers, political speeches, official reports, interviews, videos, films, photographs, and magazines, among other means of visual or auditory artistic expressions (i.e., parts of songs)—help to describe the social scenario. Thus, they are essential elements in the constitution of the windows (data) that express, creatively and expressively, the social scenario observed.

The *researcher's definitions* and the ways in which *expressions* and the *theoretical framework* were defined are discussed in the first section of this dissertation. In the following, I present the design of the *reports* of the research participants.

5.2.1 Research participants

This research echoes the voices of fourteen participants: immigrant people and mathematics teachers who work with immigrant students. It also echoes my own voice as a mathematics educator and researcher.

First of all, a researcher becomes a participant in the research when taking action and getting involved directly in the reality under investigation (Fiorentini; Lorenzato, 2009; Triviños, 2006). As a result, I consider myself a participant in this study. Furthermore, the researcher must be critically aware of their personal self-location (across, for example, gender, race, class, sexuality, ethnicity, nationality). Such positions and interests influence all stages of the research process.

Subsequently, this research draws on aspects of *cooperative research*[88] in which people voluntarily decide to participate in a data-producing situation. According to Barbosa (2018),

> In this case, participation is not out of obligation, as sometimes occurs when the researcher produces data in his class in which he works as a teacher; it is also not by co-option, when, for example, the researcher, to facilitate the collection/production of data, organizes a university extension course. Cooperative research requires agreements between the researcher and those who will cooperate with the research (p.38)[89].

Immigrants of different nationalities, over 18 years of age and who attend (or have attended) immigrant reception shelters in the State of São Paulo were invited to participate in

[88] Cooperative research is not the same as collaborative research. Collaborative research considers joint work "throughout the entire investigative process, going through all its phases, which range from the conception, planning, development and analysis of the study, even getting to participate in the writing and authorship process" (Fiorentini; Lorenzato, 2009, p. 67, my translation).

[89] Translated from: "Neste caso, a participação não é por obrigação, como, por vezes, ocorre quando o pesquisador produz dados em sua turma em que atua como professor; também não é por cooptação, quando, por exemplo, o pesquisador, para propiciar a coleta/produção de dados, organiza um curso de extensão universitária. Pesquisas cooperativas exigem acordos entre o pesquisador e aqueles que irão cooperar com a pesquisa" (Barbosa, 2018, p.38).

the research. They filled in a questionnaire to give information about whether they were able to communicate in Portuguese, if they were able to participate in an online interview (and when they could do so), and if they were willing to be a participant in the research. The participants were chosen according to their answers, but without regard to skin colour, nationality, or gender.

Mathematics teachers from the State of São Paulo, with experience in teaching and/or management in different public schools that serve immigrant students, were invited to participate in the interview. This connection was made through the researcher's network by contact with a mathematics teacher in São Paulo.

Thus, the research participants were able to voluntarily present their reports and reflections on their social contexts. In terms of researcher/researched, there is no hierarchy—participants are not objects of the investigation, nor "the Other" in the process. As the researcher, I steered away from a colonial relationship where I was the person with power, but instead demonstrated humility and generosity toward the research subject. It is possible for research to produce data *with* the participants (Skovsmose; Borba, 2004). Thus, they have a protagonist role throughout, with the possibility of speaking about their realities, and the researcher's goal is to learn from and advocate for those participants based on equity relations.

Many potential participants could not be part of this study due to limitations with internet access and/or lack of necessary equipment (cell phone, computer, camera, microphone, and headset) to participate in online data production. Such limitations usually occur in contexts of socioeconomic vulnerability. These were some borders faced during the data production due to the Covid-19 pandemic.

5.2.2 About the interviews

The purpose of the interviews was to construct the research participants' reports on international immigration and their perceptions of the role of mathematics in this scenario. Reports on situations related to school and non-school life were considered in order to reflect on the possibilities of inclusive mathematics education.

The interviews were conducted via the internet. Despite the challenges, online interviews have potential, especially for conducting qualitative studies in the context of social distancing imposed by Covid-19, as it is one of the few options available in this sort of situation. They also enable us to investigate several themes present in the lives of people and families (Schmidt et al., 2020). Further strengths of online interviews include:

> (1) greater geographic coverage, including people from different locations; (2) savings in financial resources and time reduction in data collection, as there is no need for large displacements; (3) greater safety for participants and researchers, given the context of a pandemic; (4) possibility of investigating sensitive topics, as the participants are not face-to-face with the researchers or in public places, such as universities and hospitals; and (5) access to socially marginalized and stigmatized groups, who are often more reticent to exposure. (Schmidt et al, 2020, p.961)[90].

The interviews were recorded in audio and video, with the participants' permission, by an online platform. The chosen platform was Google Meet, and the participants only needed the link sent by the researcher to access the virtual room, with no requirement for prior knowledge about the platform. WhatsApp was the platform chosen for initial contact with participants, through which it was possible to invite them to participate in the study.

This stage of online data production needed adaptations. There was some concern about extending the interviews too much, as this could cause the participants greater weariness than face-to-face interviews. Another important adaptation refers to the environment in which the participants were at the time of the interview (social distancing context), and it was not always possible to ensure minimal interruptions, as most of the time the participants were at home with their families.

This research was partly inspired by semi-structured interviews. According to Laville and Dionne (1999), the semi-structured interview is made up of a series of questions, asked verbally in a foreseen order, which follows the guiding thread based on a problem; the interviewer may add clarifying questions.

The question scripts for this research helped in the direction of the dialogue and the stimulation of the speech, bringing flexibility and greater openness to the interviewee. The interview script was used to structure the moment of conversation between the researcher and the participants, in order to favour free expression. The researcher not only remained attentive to listening, but also shared their experiences, like the participants in the research. The idea was to build an interactive dialogue environment in which participants could feel comfortable.

For the interviews with the immigrants (interview scripts in appendix), the following points were considered: reports about their families' context; reflections on inequality, exclusion, and social and racial justice; reports on the experiences of students and children of

[90] Translated from: "(1) maior abrangência geográfica, com inclusão de pessoas de diferentes locais; (2) economia de recursos financeiros e redução de tempo na coleta de dados, pois não há necessidade de grandes deslocamentos; (3) maior segurança de participantes e pesquisadores, frente ao contexto de pandemia; (4) possibilidade de investigar tópicos sensíveis, pois os participantes não estão face a face com os pesquisadores e nem em locais públicos, como universidades e hospitais; e (5) acesso a grupos socialmente marginalizados e estigmatizados, comumente mais reticentes à exposição" (Schmidt et al, 2020, p. 961).

immigrants in the school and non-school context, as well as in mathematics classes; discussions about racism and xenophobia in various contexts, and discussions about the relationship of mathematics in these contexts. The questions were divided into three blocks: questions related to the background, questions related to the present moment, and questions related to the foreground of the participants. The questions provided guidelines and could be returned to throughout the interview so that the participants could comprehend better in case they had difficulties understanding any statement.

As for the interviews with teachers (interview scripts in appendix), the following were considered: immigrant students' contexts and school contexts with immigrant students; understanding their considerations about immigrant students; reflections on inequality, exclusion, and social and racial justice; the relationship of mathematics in the context of immigrant people, and reflections on racism and xenophobia.

In general, the search was for elements that would help identify how the participants live, react, (re)signify, redefine values, and interpret the social context in which they find themselves. The intention is to comprehend the necessary social transformations. For this, sometimes, there was also inspiration in the use of projective interviews (Goldenberg, 2004) with visual resources (reports, images, and videos) to elicit the participants' response (Annex).

For the interviews, approvement from a Research Ethics Committee was necessary. This was given after analysis the research project, interview scripts and the Free and Informed Consent Term (ICF) [91], a document signed by the research participants (Annex)[92].

The participants were interviewed individually and in Portuguese. To record the data produced, audio and video recordings were used, as well as a field diary for notes made by the researcher about memories of the context of the speeches, the climate of the discussions, the episodes of silence, elements of the interactions between the researcher and the research participant. At first, contact with some participants was necessary to consider the feasibility of the interview, as well as for a first presentation and formalisation of the invitation to participate in the interview.

Regarding the interviews with the teachers, some took place while the teachers were at home, others while they were in the schools where they work. In both cases, it was not always possible for them to find a reserved environment so that they would not have the interruption of a family member or some of their students.

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[91] In Portuguese: Termo de Consentimento Livre e Esclarecido (TCLE).

[92] The Research Ethics Committee approved the data production under the registration number in *Plataforma Brasil* – CAEE: 42345220.5.0000.5465 and under approval number 4.836.230.

In interviews with immigrants, it was sometimes necessary to repeat words and ask questions again. At times, the participant answered something totally different from what was asked, making it clear that they had not understood what they had been asked. Sometimes, there is a clear barrier to understanding the language; other times, it is due to a lack of understanding of concepts or ideas presented, and other times it is because they do not want to share something.

The questions were organised in order to gradually build up to sensitive topics. Thus, it was necessary to have sensitivity to the participants' openness or lack thereof. The impression was that many of the participants, at first, were shy and suspicious about my role as a researcher, which was strange to them at that time. This is reasonable, since many immigrant people live in a situation of social disadvantage or fear some kind of inspection over their immigration conditions.

Thus, questions about their immigration situation, where they worked, or possible experiences with racism were topics that seemed to make the participants uncomfortable, and it was not always possible to get answers at first. Only with the progress of the interview and the sharing of some of my own experiences was it possible to gain a participant's trust and open space for a conversation of exchanges. Some immigrants who were interviewed, for example, only felt the urge to report important experiences when I declared that the interview had ended and that I had stopped recording.

"Interviews may spark epiphanies imparting new understandings of past experiences and relationships" (Charmaz, 2021, p.166). Thus, interviewees were often given the opportunity to reflect on their own experiences, as well as giving me the chance to learn about their lives and hear their stories from their perspectives.

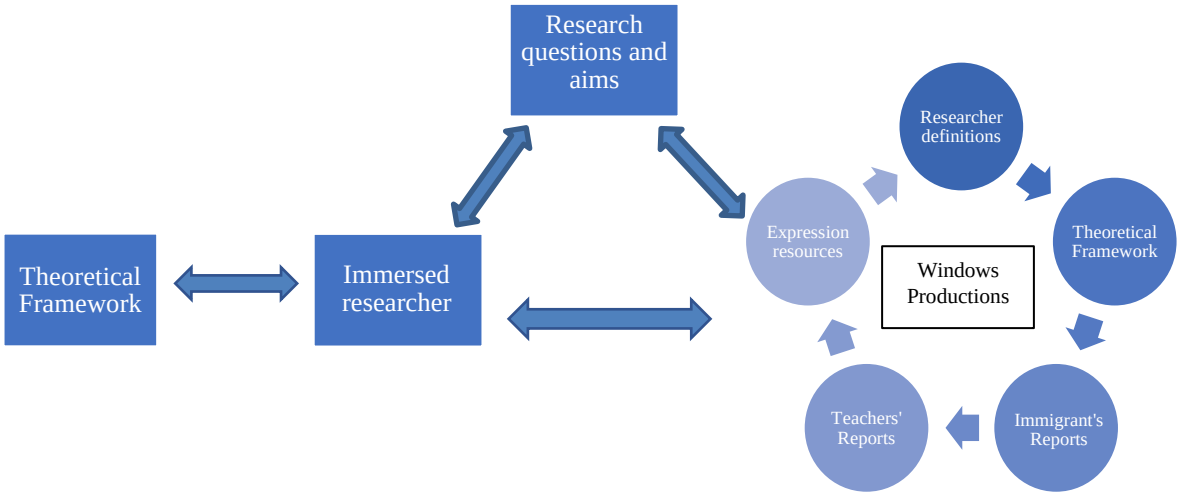
For the transcription of the interviews with the immigrants, some speeches were restructured for better understanding in Portuguese and English, a sometimes tedious tears-inducing labour that included listening to the interviews, understanding what was said, and translating and transcribing as clearly and faithfully as possible.

5.3 Data analysis: About the lens to see the world.

For the data analysis, theoretical lenses are employed to explore and understand how mathematics education might become inclusive of immigrant students, in relation to conflicts linked to immigration-related issues. The metaphor of using lenses/glasses refers to the possibility of interpreting social scenarios mediated by the lens of theory and based on research

questions and aims. This requires constant revisiting at various stages of data production. This process occurs in the following illustration:

Figure 21: Data analysis process



Source: Produced by the author

The analysis process was partly inspired by Pierre Bourdieu's sociological analysis, the theoretical and conceptual contributions of which enable exploration of the social context; it is related to the analysis of the world in terms of social structure as a reflection and analysis of a lived moment (Bourdieu, 1997; Silva, 1998). Such sociological analysis interacts with the methodological conceptions discussed in this chapter—those on theoretical reflection and possibilities through understanding political, historical, and social contexts, and therefore on the constructions guided by intentionality and transformations of human existence.

Once again, this research aims to understand how exclusion and social injustice reflect on the context of mathematics classes, and how mathematics classes can be inclusive environments for immigrant students. Thus, the process of analysing the data produced permeates all stages of production, including considerations of how to research and what to research, and illuminates both research practices and discussions in mathematics education.

In this process, what was said in the interviews is analysed along with other data in an attempt to go beyond the words to the real scenario. A critical examination of social structures, their constitution, and transformation processes that result in social inequalities and injustices

is necessary, attempting to describe the way society presents itself, as well as its dialectical mechanisms of operation and transformation of reality.

In this sense, social phenomena's objective and subjective components are expressed in the production process. Research participants report their experiences both as an individual and as a collective product of the social contexts in which they are inserted. There is a breakthrough in the opposition between understanding and explanation, individual and society, and a displacement of the participant researcher's gaze in the search to understand how the interviewees interpret and describe the world around them.

The Constructivist Grounded Theory also influences the analysis process. Moving back between theorising and collecting data increases the level of abstraction and complexity of the analysis (Bryant, 2017). The study of the previous interviews supported subsequent interviews with other participants and influenced the approach and depth of the questions in these subsequent interviews. I focused my observations on developing key categories while still in the field, gaining rich insights. The analysis could become more critical as it successively took larger social structures into account and flowed from the researchers' interrogation of data and the context in which these data are situated.

With the research goal in mind, this process begins with the transcription and exploration of the material, for which it was necessary to listen/watch the interview's recordings multiple times. Then, the attempt is to gather interview excerpts that engage the same aspect of the social scenario. Thus, it is possible to create thematically distinct categories. These categories are not established by interviews only. As stated in previous sections, the data/windows of this research were produced in five stages. All the data production moments together provide possible themes to be addressed in the analysis. This makes it possible to interpret the contexts, with the support of the theoretical framework lenses.

Thus, some thematic blocks were defined, like: *racism against immigrants, citizenship education, globalisation and ghettoisation, inclusive mathematics education, meetings amongst differences, mathematics education for social justice, and landscape of investigation*. These themes were built throughout the research process. They are not, therefore, themes that emerged from the *a posteriori* interviews. They are themes that direct the gaze to a social and educational scenario with immigrant people during the analysis.

This dissertation looks at the windows produced with the data, and through them, makes an analysis based on the themes listed. There is no kind of hierarchy in the sense of importance in relation to these topics. The themes will give direction to discussions for the analysis

chapters. One or more themes, considering one or more windows/data produced, can be part of a chapter that will be presented in paper format, in Section C of this dissertation.

Through the analysis process, I seek to understand why and how something could be different as the basis of generating ideas in transformation and creating other pieces of knowledge. For this research, the transformation is in the mathematics classroom and the social scenery in general. Besides, both contexts are intertwined. Imagination can be related to expectations and hope, based on a theoretical framework that can be reformed or transformed.

6 PRODUCING WINDOWS

This research begins in 2019, when project preparation (i.e., the organisation of research procedures) began. In 2020, given the conditions imposed by the Covid 19 pandemic, significant changes in the procedures and research execution schedule had to be made. From the beginning, the directions of research as well as the production of data (windows) went through definitions and redefinitions, and this was intensified by the uncertainties posed by the pandemic situation.

In this way, as discussed in the chapter on methodology, we were able to rethink some elements of the research constitution and understand that all layers structuring the research were represented in the production of data. The *researcher definitions, theoretical framework, reports from mathematics teachers* and *immigrants and expression resources* are all defining the data constitution. They define windows through which it is possible to analyse the social scenario and discuss inclusive mathematics education with immigrant students.

The researcher's definitions—influenced by their background and foreground—are presented in the introductory chapter of this dissertation, while the theoretical framework can be understood in Chapters 2, 3, and 4 of this dissertation. In this chapter, I present the researched social scenario and the data/windows produced after discussion with the cooperative participants of the research: immigrants and teachers.

6.1 The social scenario of the research

According to Bourdieu (1977), social fields are structured and abstract environments in which competition between people and between groups takes place. For the author, the field is organised around structuring axes that form the space of relationally defined positions. Taking inspiration from this conception, I will refer to the space studied in this research as a *social scenario*. The social scenario is defined by a range of elements such as cultural, political, environmental, economic, educational, and technological dimensions, for instance. This scenario impacts the way in which people (individually or collectively) and institutions organise themselves, establish relationships, and promote action in different contexts.

In this dissertation, the social scenario is not a simple background for the discussion of mathematics education. For this reason, I do not call it the context of the research. The social scenario is an object of study, since it gives rise to social dynamics—the ways in which people identify and interact. This scenario is marked by concepts such as citizenship, diversity, social

justice, globalisation, human rights, racism, and inclusion that represent the different ways of living and relating in society.

Critically understanding the social scenario in its multiple relationships, established social schemes, domination, and reproduction schemes is essential to understanding educational demands and to thinking about possibilities for social transformation.

A macro and micro dimension of a social scenario must be considered. This means that the space studied in this dissertation sometimes uses elements from a broader global social scenario and sometimes uses elements from more specific spaces.

In the following, elements that can expand knowledge about the social scenario of the research will be presented in order to give a more tangible meaning to the discussion of the borders that separate immigrants and non-immigrants in spaces of inequalities and social injustices.

6.1.1 About São Paulo

The scenario of this research is located in the state of São Paulo, one of the 27 federative units in Brazil, whose capital is the city of São Paulo (same name) in the south-eastern region of the country. The state is subdivided into 645 cities and a population of approximately 44 million people. Currently, the city of São Paulo, together with its metropolitan region, has more than 20 million inhabitants, being the most populous in the Americas and one of the most populous in the world. The city is possibly one of the most diverse cities in the world for having, in addition to people of Brazilian nationality, people from different parts of the world.

The state was the destination for many European immigrants in the first half of the 20th century. The great migratory flow was due to the economic and socio-cultural situation in Europe at that time, and the opportunities offered by the Brazilian government for immigration.

Figure 22: Immigrants waiting to be registered in São Paulo

Source: São Paulo State Immigration Museum Collection[93]

Migratory flows from other parts of the world took place at the same time. During this period, around 2.5 million immigrants arrived in the state. In Figure 22 above, some immigrants are waiting for registration at the *Hospedaria de Imigrantes* in São Paulo, where, after certain procedures, they were registered and could receive the necessary documents to stay in Brazil. There, immigrants could find help with interpreters, accommodation, and searching for a job.

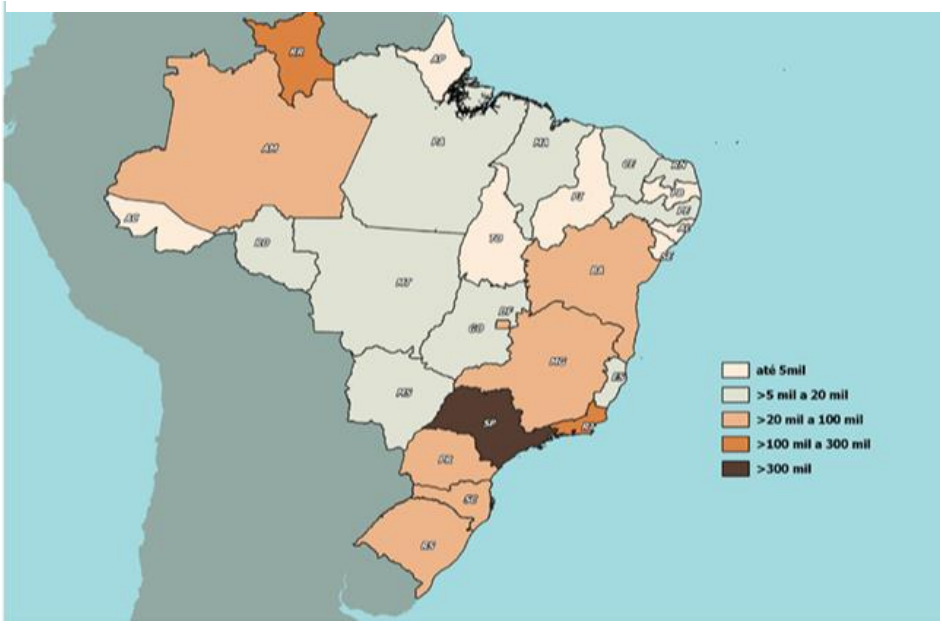
The immigrants organised themselves in certain places throughout the state, areas for each community: Jewish, Japanese, Italian communities, among others. For instance, the city of Bastos, about 536 km from São Paulo, has the highest percentage of people of Asian origin in the state. The city of Holambra is a city built by Dutch immigrants and the city of Campos do Jordão, which was also built mostly by European immigrants, today is considered the "Brazilian Switzerland".

In general, the state has today one of the largest populations of origins from Portugal, Japan, Bolivia, and Italy in the whole of Brazil. It is important to add that in this scenario of immigration flows, there is also internal migration across the country. This led the state of São Paulo to have the largest contingent of north-easterners outside the Brazilian north-east, for example.

Currently, the state of São Paulo is still the destination of migratory flow, being the state that receives the most immigrants in Brazil. Figure 23 shows the number of immigrants applying for residence from 2011 and 2020 in Brazil. The darker colour indicates that the highest concentration of immigrants for this period is in the state of São Paulo.

[93] https://artsandculture.google.com/story/os-registros-do-migrar-museu-da-imigracao/ggWhdzeYp2NvLA?hl=pt-BR

Figure 23: Number of immigrants applying for residence (2011 – 2020)



Source: Prepared by OBMigra, based on data from the Federal Police – SisMigra, 2020

Every immigrant in São Paulo is regulated by laws and policies. For example, in 2014, the Reference and Service Center for Immigrants[94] (Crai-SP) was established as a public reference centre providing services to the city of São Paulo's immigrant population, regardless of their migratory status. The apparatus is created to help migrants in accessing their rights as well as social, cultural, and economic integration.

Recent set public policies have been implemented in the state of São Paulo with the objective of promoting and articulating public migration policies in a transversal way and from the perspective of the immigrant. These policies reflect on ensuring enrolment for all immigrant students, whether they are in good standing or not, following the parameters of set of laws[95].

Approaching five centuries of existence, the capital São Paulo, "city of a thousand peoples", is the gateway for immigrants in the state and in the country. The Figure 24 below shows Paulista Avenue is in the centre of the city.

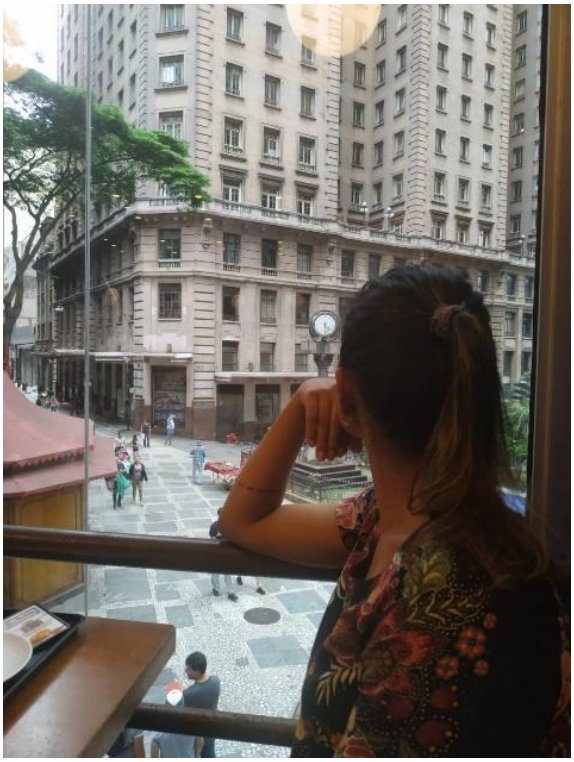
[94] This organisation includes programmes and welcome projects (emergency shelters), training, education (Portuguese lessons), cultural fairs, regularisation, work, and other forms of assistance.
[95] For instance, Resolution number 1, 13 November 2020: Provides for the right to enrol migrant, refugee, stateless and asylum-seeking children and adolescents in the Brazilian public education system.

Figure 24: Paulista Avenue

Source: Author's Archives

In Figure 25 below, I am in a bakery in São Paulo, watching a square through the window. This photo is quite illustrative of the development of this research. It symbolises my look, through the window, at the complexity of a social scenario, in which the immigrant people live, searching to understand the social dynamics and the influences in education. From a critical look at this social tangle of São Paulo, the quest is to understand how mathematics can influence and be influenced by this situation, as well as what the demands and possibilities are for inclusive mathematics education in this scenario.

Figure 25: Watching through the window.



Source: Author's Archives

São Paulo has the highest Gross Domestic Product (GDP)[96] among Brazilian capitals. If it were an independent nation, the city could be classified as the 36th largest economy in the world—a scenario where diversity seems to be welcome. However, the map of social inequalities released by Rede Nossa São Paulo[97] in 2021 shows intense social inequalities. Residents of the city's upscale neighbourhoods live, on average, 22 years longer than residents of poor neighbourhoods. The city is home to some of the largest slums in the world, such as Heliópolis, with more than 40,000 residents, where more black and younger people live than the city's average population. In 2019, the census showed that almost 32,000 people are homeless in the city, an increase of more than 30% in the last two years. About 3.4% of this population are immigrants[98], which does not include the population in reception centres. Certainly, the Covid 19 pandemic has further accentuated the structural inequalities in this context.

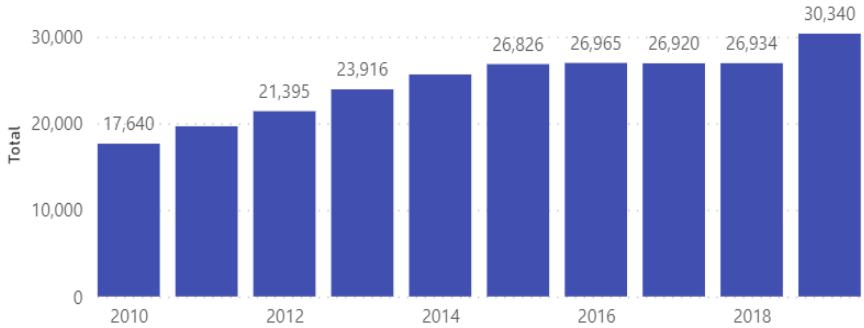
[96] GDP is the total value of goods produced and services provided in a country during one year
[97] https://www.nossasaopaulo.org.br/
[98]See more in: chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.prefeitura.sp.gov.br/cidade/secretarias/upload/Produtos/Produto%209_SMADS_SP.pdf

Kleber Gomes, singer-songwriter, rapper, and known under the artistic name of Criolo, in the song ‘There's No Such Thing as Love in SP’, sings about the arid and sad side of the country in the midst of wealth and diversity, with its many ills and inequalities. In this fragment of the song, the artist expresses the contradictions and pitfalls that can be present in a city postcard that conveys the idea of a city for everyone.

A mystical maze
Where the graffiti yell
There's no way to describe it
In a pretty sentence
On a really sweet postcard
Beware the sweet
São Paulo is a bouquet
Bouquets are dead flowers
In a pretty arrangement
A pretty arrangement made for you[99]
Kleber Gomes

According to information from the portal of the National Institute of Educational Studies and Research Anísio Teixeira (INEP), the number of enrolments of students of other nationalities in Brazilian schools has more than doubled in the last ten years, going from just over 43,000 in 2010 for over 130,000 in 2019. The state of São Paulo receives over 30% of all these enrolments.

Figure 26: Diagram Immigrant students enrolled in basic education in São Paulo state



Source: www.nepo.unicamp.br/observatorio/bancointerativo/numeros-imigracao-internacional/censo-escolar/

[99] Translated from: Não existe amor em SP/ Um labirinto místico/ Onde os grafites gritam/ Não dá pra descrever/ Numa linda frase/ De um postal tão doce/ Cuidado com doce/ São Paulo é um buquê/ Buquês são flores mortas/ é um lindo arranjo/Arranjo lindo feito pra você. https://lyricstranslate.com

The graph above presents, through a bar graph, the evolution in the number of international immigrant students enrolled in basic education in the state of São Paulo since 2010. The last bar shows a significant increase in the number of enrolments carried out in 2019. Most immigrant students in Brazil, more than 40%, come from Latin America, mainly from countries such as Venezuela, Haiti, and Colombia. Thus, the context of research data production is in the state of São Paulo, where the largest number of immigrant students in the country is concentrated.

Figure 27: Table immigrant students in public school in São Paulo (2019)

	Countries	**Number of students**		**Countries**	**Number of students**
1º	Bolivia	5.022	6º	Peru	410
2º	Japan	1.307	7º	Colombia	401
3º	Haiti	998	8º	Venezuela	395
4º	Angola	594	9º	Portugal	327
5º	Paraguay	433	10º	Argentina	322

Source: Secretary of Education of the State of São Paulo

In 2013, the state government created an Educational Inclusion Centre and a special centre for immigrant students from the state education system. This centre, which already worked in indigenous and quilombola education, now includes issues related to immigrant students in order to guarantee the right to education, with quality and equity, regardless of ethnic, social, or racial differences. Since 2018, teachers and school managers have been able to access guidelines on the reception of immigrant students in the state education system, which is recognised by UNHCR, the UN Refugee Agency, as an important document.

6.2 The cooperative participants

In this session I present the fourteen cooperative participants of this research. The descriptions were prepared from information obtained from the questionnaire (Appendix), from observations made during the interviews, and from the speeches of the participants. Their names have been changed to preserve the identity of each of them.

Figure 28: Table list cooperative participants

Interview	Status	Nationality	Pseudonym
T1	School Principal	Brazil	Elias
T2	Teacher	Brazil	Markus
T3	Teacher	Brazil	Naomi
T4	Teacher	Brazil	Miguel
T5	Teacher	Brazil	Lucas
IM1	Immigrant	Venezuela	Ricardo
IM2	Immigrant	Venezuela	Frida
IM3	Immigrant	Venezuela	Clara
IM4	Immigrant	Venezuela	Mila
IM5	Immigrant	Haiti	Leo
IM6	Immigrant	Haiti	Max
IM7	Immigrant	Haiti	Samuel
IM8	Immigrant	Haiti	Julius
IM9	Immigrant	Haiti	Toni

Source: Produced by the author

The mother tongue of the Venezuelan people is Spanish. The native language of Haitians is French and Creole. The Brazilian teachers have Portuguese as their mother tongue. In the following, I present the group of teachers and then the group of immigrants with only the excerpts from interviews that appear in this dissertation's analysis papers, although all interviews were transcribed and analysed in the analyses process.

About the teachers participants

Markus tem formação em matemática e pedagogia com pós-graduação. Ele é professor de matemática no Centro Integrado de Educação de Jovens e Adultos (CIEJA) de Perus, um distrito situado na zona noroeste do município de São Paulo.

> *Markus:* And we are a racist, xenophobic, sexist country. So, it happens all the time. There are students that we try to include. But we have discrimination in a room with a lot of Haitians. Brazilian students feel that they have to be given priority over Haitian students. [...] We also witness looks, "faces and mouths". I hear: "Hey teacher, I don't want to attend classes in rooms with many Haitians"; "Why don't they stay in their country?"; "Why do they come to take our jobs?"

> *Markus:* There was a girl who mentioned that she needed to find a boyfriend. I suggested that there were many boys at school. She replied that she didn't want a Haitian one: "Ah! God forbid dating a Haitian!" One of them (a Haitian student) asked: "Why don't you want to date a Haitian?". And she was embarrassed and didn't answer. We know it has something to do with xenophobia and racism.

Markus: And oddly enough, Haitians don't seem to understand that they suffer from racism or prejudice. They don't see themselves as people who suffer from prejudice. They think they are not victims. They respond that they have never experienced racism when asked. There's no way not to notice, but they think that's normal.

Markus: Oh! It would be totally different if they were American, German or Japanese, for example. There's the issue of skin colour, right? And then there's the stereotype issue. People are very social and status oriented. In the stereotype of the Haitian, it is difficult to see a successful and wealthy person.

Markus: We show numbers of how bad and harmful this is. Holocausts, the number of deaths. People talk about Nazism, always showing numerically that racism, xenophobia, and machismo are bad for the world and society. Always showing numbers.

Markus: The student wants to improve his social condition; he wants to express his citizenship. He wants to be a more important person. He goes after mathematics to have better conditions for it. To take a civil service examination, to join the police, to enter college. The role of mathematics is to offer conditions for him to ascend socially.

Markus: And the more knowledge a person has, the more citizenship that person has. We say that knowledge is power. So, every part of education goes through mathematics. A person has to know mathematics to exercise citizenship, to get a job and to move up socially. Understanding how politics, economics works, to know how to save money, mathematics is in everything. I always try to say that mathematics is everywhere and you're going to need it.

Markus: You hardly ever have a Haitian who doesn't know the four operations. Most of them master the four operations. And from there it is easy, you just need to teach the new concepts. But the coolest thing is trying to get them to read the problems. They ask about the meaning of certain words. Mathematics takes a backseat. The class is about mathematics, but for immigrants we teach language, communication, public policies, solidarity, citizenship and education.

Markus: We have many projects focused on integration, because the culture is different. We have several festivities. We have several themed parties. Every year we have a party called Brazil/Haiti. And at this party, we do all the decorations. Students parade and bring typical music. We have a mix of cultures, which is very interesting.

Markus: In the small lines we realise that there is (prejudice). There was a girl who said that she needs to find a new boyfriend, because she had just divorced from her ex-husband. I suggested that the school had many boys. She replied that Haitians she didn't want any: “Ah! God forbid I date a Haitian!” One of them (Haitian student) asked: “Why don't you want Haitian?”. And she was embarrassed and didn't answer. We know it is related to xenophobia and racism. Oh! If it was an American, a German or a Japanese it would be totally different. There's the issue of skin colour, right? And then there's the issue of stereotypes.

Markus: We are in a pretty poor area of the city. ### (area name) is on the outskirts of São Paulo, next to a cemetery, with many communities around. It also has a large number of Haitian immigrant students. It's like a Haitian hub there.

Markus: Learning a high school equation is least important for immigrant students. What matters to them is being together with other Haitians. They want to speak Portuguese fluently to move up socially. Most Haitians arrive here in Brazil in a vulnerable situation, living in places that are not very well located, with a lack of internet, lack of pavemented streets, for example. Haitians are, therefore, in a vulnerable condition.

Markus: We do very basic things, taking into account the four fundamental arithmetic operations, percentage, and rules of three. No one will make a logarithm, a quadratic graph, or a maximum and minimum point. We don't get to that part, although it's in the curriculum.

Markus: I can say that Haitians who work dress very well; they are well dressed, well groomed. They are very concerned about appearance. It has its own style. Maybe that scares you a little. But that doesn't characterise a successful person. They go by bus or train to school. And this is not status. And the person who makes that kind of comment, they're looking for a different person. Either she is prejudiced about colour, or she is xenophobic about the country, or she wants status. It's not common for us to see a Haitian get there by car or motorcycle, which would demonstrate that the person has a little more condition. And oddly enough, Haitians don't seem to understand that they suffer from racism or prejudice.

Markus: They (immigrant students) communicate with each other and end up passing information to each other. And that ends up calling several of them to study there. For example, the ### (school name) is a school that has a lot of Haitians. They meet there and form groups among themselves. They end up talking to each other, looking for things in common. They frequent the same rooms. They (immigrant students) are so loyal that the enrolment number only grows.

Naomi is a mathematics teacher and has worked for twenty years in public schools in the State of São Paulo. She has also taught informatics and has experience in youth and adult education. Today she is retired.

Naomi: As my classes are in mathematics, we are more focused on certain knowledge (technical knowledge). And there are other classes that are more focused on these (social) issues. They (the students) do not report anything because I think there is no time to get into this subject of racism or xenophobia. We don't have a moment to give them (the students) an opportunity to report something. In literacy and in the areas of History and Geography, they have more space to make these reports. In mathematics, there was never any report. I think the focus ends up being different for us. There are areas of knowledge that further explore this issue of racism. I never explored that area.

Naomi: So, this exchange of experience between students is very rich. Because sometimes people think they are right about their opinion on an issue that is happening here in Brazil. Here comes another person who says that in her country it is different. And this comparison that is made of how it is there: the question of how the education is, the economic issues. All these subjects that

> the agent addresses, the student also brings his experience. He has the voice and shares with everyone in the room what he brings to knowledge about that. This exchange of experience, I think, is very positive.

Miguel has been a mathematics teacher at a state public school in the city of São Paulo since 2004. He has always been very interested in participating in this research and has always made himself available so that the research could take place in some of his classrooms, a fact that was not possible due to the barriers imposed by the Covid 19 Pandemic. Teacher Miguel has a postgraduate degree in interactive technologies applied in education and he has a master's degree in mathematics education.

> *Miguel:* The acceptance is not the same. What I perceive is that there are some differences—for example, if the student is of Bolivian origin, acceptance is different if he is Angolan or Nigerian or if he is Muslim. Acceptances are different in different contexts.

> *Miguel:* In addition to international immigrants, the school has a lot of national immigrants. We have many North-Eastern children as well. And they end up fitting into that profile, something that draws a lot of attention. This issue of xenophobia is not just for foreign migrants but also for Brazilians who come from other states, especially the northeast region. I remember that immigrants were discriminated against by speech, accent, by the type of clothes they wore.

> *Miguel:* I guess that in mathematical thinking, if we were to stop to think, the logic you use to solve problems can be opened up in the sense of remedying conflict issues. Because if the person is critical, they will better understand the context and understand that this issue of xenophobia or discrimination is not something acceptable. It is a crime and cannot occur. In general terms, regardless of whether we think of mathematics as curriculum or content, in essence, mathematical thinking focused on solving problems (in the sense that you understand the context, analyse the problem, and propose solutions) is essential. Because it's something you use to prepare for life. In our lives, we deal with problems all the time. We need to analyse the contexts; we must make decisions. We need to see what the best decision is in that context. Mathematics contributes to this context. In life, learning is not just focused on specific content, but on how we solve problems. How do we solve problems? Working on this critical issue, I always ask students never to get caught up in the specific issue of the object but rather to understand the context in which it is inserted in the critical sense.

> *Miguel:* Both students of African origin, as well as students of Muslim or Asian origin, curiosity is greater. I didn't understand the issue of xenophobia with them or any kind of aggression, whether physical, speech or exclusion. I see that there is more the matter of curiosity to understand what their life was like in that country, what the schools were like in their countries of origin, what the teachers were like. There's a lot of curiosity. I think what they see on television, this issue of terrorism, the issues of extremists, they end up asking a few things about it.

Miguel: We have 46 different nationalities at the school. More than half of the students are from South America, mostly Bolivians. But we have a considerable group of Argentineans, Paraguayans, Colombians, Venezuelans and Chileans. I realise that Brazilian students make jokes, and they end up calling everyone who speaks Spanish Bolivian. It may happen that some students get offended. There was a situation where the student was Colombian. I didn't know. He was called a Bolivian and felt offended. He said “I am not Bolivian. I'm Colombian. Don't call me that."

Miguel: Acceptance is not the same. What I perceive is that there are some differences: for example, if the student is of Bolivian origin, acceptance is different if he is Angolan or Nigerian or if he is Muslim. Acceptances are different in different contexts. Because many come because of the activity that the family carries out here (in Brazil).

Miguel: We try to have a different look, although, in general, I apply the same activities that I give to Brazilian students, so as not to cause a difference. I already applied an activity A for the class, and, for that immigrant student, I applied another activity. This immigrant student did not like it and said: “Why do I have to do a different activity? I want to do the same activity”.

Miguel: My interaction with immigrants was even more significant due to the school's location. For those unfamiliar, ### (region name) is a well-known shopping district in São Paulo. Around the school, there is an area exclusively for commerce. Basically, there are no residences but shops. Most of our students are children of people who either work as salespeople in retail stores or clothing production lines.

Miguel: Some students of Bolivian origin have a specific difficulty with the issue of taking a shower every day, keeping their nails clean, and not wearing the same clothes all week. For about two or three years, we had this meeting with the school coordinator about this - this is not typical. To help us grasp this better, someone from the social department shows us a small amount of the context. When the Bolivian people come to Brazil, they mostly come to work in the manufacturing sector. As a result, when we look at ### (region city name), the stores are townhouse models. At the bottom, the ground floor is the store. On the mezzanine floor, which is not very visible, is the production area, where they sew. In general, it's kind of unhealthy. We saw pictures of what their work context looks like. And due to the issue of poor salaries, it is quite common for Bolivians to live in very small accommodation that is meant for three people but accommodates ten people. Or with several rooms and only one shared bathroom for thirty people. So, when the Brazilian student says, “That student stinks, you can't go near them”, it is clear that it is due to this situation.

Lucas is a teacher at a public school in the city of São Paulo.

Lucas: I developed a chess project at school, which I think has a lot to do with mathematics. The number of foreign students who attended this project was very large. Half of the class was foreigners, which surprised me, even for their performance in mathematics. The South American students liked it a lot, they were more interested. I don't know if it's something cultural or if it's a general commitment to study, but their relationship with mathematics was better. Despite the fear of the language issue, it flowed well, they had a good understanding.

Lucas: It was common for many immigrant students, they felt comfortable talking to each other. The Moroccan girl didn't speak any Portuguese. Everyone wanted to help her, she was very well received. The students from South America, they have a very large community, speaking Spanish and Castilian. They approached each other, but you saw a certain rupture, a group of immigrants and a group of Brazilians. Eventually there was the separation of foreigners and non-foreigners, something natural in my view, the separation so that the teacher could notice each one. There was interaction, but you could quickly see the separation of groups.

Lucas: I see the amount of things that are taught as absurd, regardless of whether it is Brazilian or not, I think it is absurd to be one of the subjects with the highest workload in the student curriculum. I think the teaching of mathematics is exaggerated from the beginning to the end, I don't think it should be a mathematics that has a sense of application, it is a mathematics of academic study, but not in all that exaggeration. Of course, mathematics adds academic and scientific knowledge to them, but regardless of the public, it is an exaggerated mathematics.

About the immigrant participants

Frida is Venezuelan and is 38 years old. She declares herself as a woman, white person and Catholic. Frida is married, has two children and a stepson (aged 6, 8 and 16 at the time), all of whom are also Venezuelans. They have been living in Brazil since 2016 where they have plans to reside permanently. They live in São Caetano do Sul, a city in the metropolitan region of the capital São Paulo. They have no other citizenship from another country and Frida's children study in schools in Brazil.

Frida: I work with gastronomy on the streets, and I have already experienced someone coming to my stall and saying: “But you shouldn't be here. You should be in your country.” And I ask myself: “But why? The world is open to everyone, right?”. And the person thinks you are stealing someone else's job. But I'm not taking it. Everyone can work.

Frida: At one moment during the pandemic, I was talking to a school mother about the issue of emergency aid and how difficult it was to get. And she said she didn't think it was fair. But I don't think she thought before she spoke. She

said she thought it was not fair for foreigners to receive emergency aid. Or for us to have same help as the Brazilians. I explained that this was a general situation. If there was a foreigner in a stable situation who didn't need it, that would be ok. But there are many foreign people as well as Brazilian people who need it.

Frida: When I say I'm a refugee, people say that's a very strong word, that must be difficult (my situation). As if I were a poor thing. But over time, when we start talking and after they see what we've become, they're proud of who we are. Then they understand what the word refugee means, they start to have a different view.

Frida: The indices (statistics) can be used on xenophobia and prejudice. You can see the percentage of the population that is being treated with prejudice. Mathematics helps us to understand reality.

Frida: Total challenge, tiredness and being a warrior. Because it's a tiring process. No one came to you one day and said that you would need to leave (your country). Nobody prepared you for this. You come with a learning bag, a bag of things you can't just pass an eraser on, right? You just come loaded with so many things. And then you fight, and you adapt along with everything that comes along with you, all that knowledge, and adapt to what your life is today. So, tiredness is constant. It's not just culture. It is also questions of adaptation, questions of work, of study. These are questions that, perhaps in your own country, are different. You have a whole life in the making, from childhood to adulthood. And in the case of children, they have to understand why they are not in their countries, close to their family. And then you sometimes have to forget how you feel to help the children move on. And that is a constant challenge. And think what more am I going to be able to do and overcome every obstacle you have. So, as an immigrant mother, that's tough, it's constantly tiring. You look like a fighter every day. I have to fight things that I consider to be barriers. Knowledge barriers. Barriers you didn't even know about, but you have to learn to fight against them.

Frida: I remember that my daughter, in her first year here (in Brazil), said: “Thank God that the school year is over. I couldn't stand everyone asking why I spoke differently.” She also couldn't play because she couldn't understand people.

Frida: When I enrolled my youngest son, the teacher didn't want to understand that he was young. It was the first time he went to school. That he couldn't speak Portuguese properly. And she said: “But avoid speaking Spanish at home”. And I said: “But I can't stop speaking Spanish. And I know that in Brazil’s curriculum there are Spanish classes.” So, it was a question that was rejected, about our communication.

Julius é from Haiti and he was 39. He declares himself as a man, black and evangelical. Ele se mudou para o Brazil com a esposa e a filha de oito anos.

Julius: Getting here was very difficult. It was difficult to go to the Brazilian embassy in Haiti. The visa was two hundred dollars. But there are people there, guides, who negotiated with people. Everyone was there looking for a better life. Then they say: “Do you want to go? Do you want to enter the embassy to get a visa? Those costs two thousand dollars." So, people charged this amount to cut the line to the embassy. I didn't have anyone here in Brazil, I paid a little more to have people welcome me here. At the airport in Haiti, they gave me back my passport and we boarded. It was me and another person, whom I met at the airport, who was also moving to Brazil. We got off at Belo Horizonte airport, and there was someone who came to pick me up. I stayed with this person's family for a month until I got somewhere else and met more people.

Julius: Even though one doesn't say it to you, a gesture can say everything. For example, you are on a bus. There's an empty seat next to you and you notice that the person avoids sitting there. The person even prefers to stay stand. I remember one time I went to the mall. On the way out, there was a parked car and a child with his head out the window. When I was passing by, the man in the car quickly closed the window (laughs). You don't need to think too much: it's a white guy who doesn't want to see a black guy pass by his son (laughs). That's it. And I think the fact of being an immigrant weighs more than the fact of being black. Because being black, people feel less frustrated when they are in their country, they have fewer problems. I am proud to be black. But If I were in Haiti with everything I have here, it would be much better for me.

Leo is from Haiti and was 32 years old. He declares himself a man, black and evangelical. He has lived in the Dominican Republic, a country that borders Haiti. Today he lives with his wife and children (all Haitians) in Jundiaí, a city situated about 60 km from the capital São Paulo. Leo has lived in Brazil for eight years.

Leo: Before, I had the problem of my children not understanding what they were saying. But now they understand. He still has a lot of trouble reading and writing. But that's not what makes it difficult for him to keep up with the other students, because there are students who have a lower level than him. But the problem is not that he is not Brazilian. The issue is lack of care.

Leo: Mathematics is important to help understand laws, solve housing issues, plan expenses, plan for the future, know how to organize yourself to use a credit card. It's important to know these things, because when you have nowhere to go, it's very difficult. And for foreigners it is very ugly to have a dirty name[100].

Leo: Another time, when I was working on construction, some colleagues joked: “Ah, this ‘faggot’ here, we need to talk to the president to send him away to his country!”. But it was a joke. We know that in Brazil it doesn't work that way. They had lots of jokes. It's normal. But there were others who were

[100] A person with a “dirty name” is someone who bought a product or service, did not pay and had his/her name pointed out/denied on the lists of credit protection bodies.

serious. They said that there are so many Haitians in Brazil, which is creating a lack of jobs. And I know that Brazil is a very big country, that there are lots of opportunities.

Max is from Haiti and lives in Brazil with his wife for 7 years. In Brazil they had a daughter and today they live in Jundiaí, in the interior of São Paulo. Max is 35 years old and has a degree in Agronomy. Her daughter studies in public school in São Paulo state.

Max: I think these discriminations have to do with my skin colour, yes. I've worked at about four different companies. And I perceive the treatment to be different. Like I said, if there is a heavier job or a more disgusting one, you can be sure they'll call one of us. I'm not saying I won't do it. Wherever they call me, I always go. There's a way for everything. But you must be respectful. If you are black from Brazil, you go through some situations. If you're black from Haiti, it's even worse.

Max: I have several proofs (experiences). I remember that I went to get my documents, I won't mention the name of the place, and people treated Haitians differently from how they treated other foreigners, Japanese, German, American, for example. The way they treated each foreigner was different. It was possible to see the way they received people. I don't have a word in Portuguese to describe it. We know when the person treats them differently.

Max: I know that Haiti is not a rich country. It has a lot of ugly places. But it also has a lot of beautiful places, which are the postcard pictures for the country. So, a person hardly ever reports on Haiti showing these places. They go there looking for an uglier, more devalued place to show the country. Some people also go to show the beautiful places there. But it's more complicated. And then people always comment: "Wow, how sad! Haiti is a poor country." People ask if it's hard to have food there. I understand that people have reasons to talk like that.

Max: People think that Haitians leave their country because everything is more difficult in their country, they cannot survive in their country and that they go to another country for better living conditions. And that's what goes through people's heads, you know? This might even be true. This is the case for many Haitians. But not all people are in this situation. This is not my case.

Max: I have several tests (experiences). I remember that I went to get my documents, I won't mention the name of the place, and people treated Haitians differently from how they treated other foreigners, Japanese, German, American, for example. The way they treated each foreigner was different. It was possible to see the way they received people. I don't have a word in Portuguese to describe it. We know when the person treats with difference.

Max: I see it like this: if you're good at mathematics, that country won't want to lose you. You become very important to that country. You are not anyone. For a company, for a country, you can make a difference. If I'm good at math, I can get to any university, it could be Germany, it could be Paris, the USA, Canada, Brazil. The university won't want to lose you.

Mila is Venezuelan and is 32 years old. She declares herself as a woman, brown person and Catholic. She has lived in Rio Claro for 3 years with her husband and two children. Mila 's two children are Venezuelan and study in Brazilian schools. They are in refugee status. Mila has a degree in early childhood education and worked in sales before moving to Brazil.

> Mila: I experienced humiliation at work because of religion. Also, a co-worker, afraid that I would take away her job, taught me the job the wrong way. They think that we as immigrants are not aware of our rights. [...] My brother-in-law is a musician. They hired him for music lessons, but when they found out he was an immigrant, they refused him.

> Mila: When I think about the situation of being in Brazil as an immigrant, I feel homesick, sad, depressed and happy. Longing and sadness for having left my life there. It wasn't easy to arrive in another country and start from scratch. Having to pay rent (for housing). I never had to pay rent in my life. And I felt depressed when I couldn't find work to help out here at home. And I feel happy to have found thoughtful people who have welcomed us. I feel happy to be able to count on many people.

Ricardo is from Venezuela and was 38 years old. He moved to Brazil after requesting asylum. He declares himself male, white person, and Catholic. He lives in Rio Claro (São Paulo), with his wife and two children (ages 8 and 10), all Venezuelans, for about 3 years. He says he is not sure if he intends to reside in Brazil permanently. Ricardo's children study in schools in Brazil. In Venezuela, he was a professional football player for 15 years.

> *Ricardo:* Once a person said to me: "Wow! But why does the government allow you to come and take people's jobs here?" I see that there are people who cannot find work because they are picky. I always see in the newspaper job advertisements. Then they say that the foreigner, the gringo, as you call us, comes to get the job? To take away your well-being? I think the problem is that some people are lazy and keep choosing work, saying they only want to work in an office. I've always been a football player. Here I work in a very different area. And I never complained that I don't work in my field.

> *Ricardo:* The refugee situation guarantees us almost all the benefits that a Brazilian has. But if we decide to go back to Venezuela, we lose all that. We can't even go there to visit. And we cannot participate in the elections in Brazil either. I understand. It's the rules, right? But I would like to participate in the elections. [...] I would like to influence [...] the political direction in Brazil so that it doesn't end up like Venezuela. There, with a minimum wage, we could buy only two kilos of meat. I would like to talk to people here so that they have my experience as a mirror.

> *Ricardo:* Yes, not everyone, but some immigrants face xenophobia. Especially those who do the wrong things. There are many immigrants, not only from Venezuela, but also from other countries who come here and can't find a job, or don't want to work. Then they start doing wrong things, using drugs,

> prostitution. These people end up being judged as well. So, I think there are about ten per cent of immigrants who came to do everything right, but they can't and end up doing the wrong things. There many suffer from xenophobia. Some rightly so.
>
> *Ricardo:* I think that if my family and I were a black Haitian family, we would be received in the same way here in Brazil. I think it's the same here and, in my country, (Venezuela). I don't think there's much of that racism. Racism is not just against black people; it's also against white, indigenous people. There are many types of racism. But I didn't notice any kind of racism. I think Haitians are also welcome here. Also, because their language (French) is much more different than ours (Spanish) compared to Portuguese, I think it might be more difficult for them.

Toni is from Haiti. He moved to Brazil on his own and he works in a multinational company in a city in the state of São Paulo. He has two children: one lives in Canada and the other in Brazil. He tried to move to the United States but was refused a visa.

> *Toni:* There was a woman who kept looking at me. I don't know if it's because of the things they hear from Haiti. At that time, I didn't know how to speak Portuguese well. But I realised that she was available to help with everything, but I saw that it was out of pity that she helped. I thought: “Wow, Brazil is a country that welcomes people very well”. But not everyone is the same. But I feel like I'm welcome here. But now that I understand a little and see that people have pity, they help out of pity.
>
> *Toni:* Sometimes it happens that I'm walking down the street and the person crosses to the other side, out of fear. Once I called the girl and asked why she crossed. She apologised and said she was afraid of being robbed. She'd been robbed before and all. But later she apologised. I understand.
>
> *Toni:* People see things on TV, showing that we cannot eat. There are people who ask me this question here: Is there water there? Is there rice, or are there beans? I think: Wow! It's a country. There is everything. People think Haiti is a country that has nothing. In my country, I lived better than here: my house, and car, were better. My house was twice as big as the one where I live today. But the same thing happens with regard to Brazil. My friends from Haiti ask what I came to Brazil to do. Because whenever you get news from the country it's about the bad places. There, they only hear about Rio de Janeiro and the favelas. When I arrived here, I was pleasantly surprised. It's totally different than what I imagined. Too bad the government doesn't understand what a wonderful country we have. [...] I often see people from Brazil who only know things about Brazil. Then when they ask, I show pictures, videos from the internet, beautiful things from Haiti.

SECTION C- ANALYSIS/PAPERS

Unlike sections A and B, this section is composed of papers. Four papers will be presented, each one of them a unique text, with its own objectives, theoretical discussion, data presentation and analysis. These objectives are aligned with the general objective of the dissertation, and the data arises from the same investigation. Certainly, one can find repetitions between one article and another, arising especially from the theoretical discussion, since the theorists and concepts used are, in most cases, the same among all articles. Because they have different objectives, each of the articles follows a trajectory and presents different results. Together, the results addressed in the paper seek to contemplate the guiding question of the research: *What can inclusive mathematics education do in the context of international immigration shaped by socially and racially structured injustice?*

7 MATHEMATICS EDUCATION FOR SOCIAL JUSTICE: REFLECTIONS ON RACISM AND IMMIGRATION

Manuella Carrijo

ABSTRACT:

In this paper, I present ways in which critical mathematics education can help to uncover specific features of oppression, exploitation, and injustice toward immigrant people. I address the necessity of reinterpreting mathematics education for immigrants, considering the oppressions of structural racism. Through teachers' and immigrants' accounts, this paper aims to discuss racism and stigmatisation through mathematics education for social justice in diverse classrooms. This paper is structured in the following way: (1) First, I discuss why consider racism matters in the context of immigrants. (2) Then, I discuss the impact that racism might have on immigrants through stereotypes and stigmas. (3) Next, I address discussions on reading and writing the world with mathematics, particularly immigration. (4) Finally, through pedagogical imagination, I illustrate a hypothetical possibility for creating space to discuss controversial issues in classrooms by outlining the project *The Beauty of Diversity*.

KEYWORDS: Immigrant Students, Critical Mathematics Education, Stigmatisation, Mathematics Education for Social Justice, Pedagogical Imagination.

RESUMO:

Neste artigo, apresento maneiras pelas quais a educação matemática crítica pode ajudar a revelar características específicas de opressão, exploração e injustiça contra os imigrantes. Abordo a necessidade de reinterpretar a educação matemática para imigrantes, considerando as opressões do racismo estrutural. Por meio de relatos de professores e imigrantes, este artigo tem como objetivo discutir o racismo e a estigmatização por meio da educação matemática para a justiça social em diversas salas de aula. Este artigo está estruturado da seguinte forma: (1) Em primeiro lugar, discuto porque considerar o racismo é importante no contexto dos imigrantes. (2) Em seguida, discuto o impacto que o racismo pode ter sobre os imigrantes por meio de estereótipos e estigmas. (3) A seguir, abordo as discussões sobre ler e escrever o mundo com a matemática, particularmente a imigração. (4) Por fim, através da imaginação pedagógica, ilustro uma possibilidade hipotética de criação de espaço para discussão de questões polêmicas em sala de aula, delineando o projeto *A Beleza da Diversidade*.

PALAVRAS-CHAVE: Estudantes Imigrantes, Educação Matemática Crítica, Estigmatização, Educação Matemática para a Justiça Social, Imaginação Pedagógica.

7.1 Introduction

The recent immigration phenomena have made it urgent for mathematics education to address issues related to immigrant students. The presence of immigrant students and/or children of immigrants in mathematics classes may reflect conflicts based on conceptions of belonging and non-belonging ideas in social scenarios. These conflicts vary depending on

whether a group of people portrays themselves as superior and has negative attitudes toward another group of people. In this context, differences can be used to degrade, a variant that combines fear and contempt established on racism bias. Thus, immigrant students can experience several forms of exclusion, as well as violence centred on racialisation.

Immigrant students in schools in Sao Paulo, Brazil with specific phenotypes and cultural characteristics tend to be accepted more quickly, while other groups of immigrants have more difficulties, even when Portuguese is their mother tongue (Oliveira, 2019). According to Baber (2007), even though immigrant students speak the local language without any indication of a foreign accent, they are nevertheless excluded and labelled as "foreigners" in mathematics classes, which reveals a close relationship between xenophobia-racism and the hierarchies attributed to the different groups of immigrants.

According to the United Nations (2015), immigration, racism, and social injustice are all cross-cutting issues across the 2030 Agenda, relevant to all 17 of the Sustainable Development Goals (SDGs)[101]. To measure actions taken to eliminate discrimination and to counter acts of racism, violence, and xenophobia against immigrants, it is vital to understand the world's circumstances and reimagine education.

For Skovsmose (2016; 2019; 2020), critical mathematics education is concerned with different groups of students and is relevant to teaching and learning about issues of social injustice and oppression. Critical mathematics education focuses on students in different positions: those that might face social injustice scenarios as well as those in comfortable positions. These concerns lead us to indicate the need for reflection on the education of immigrant students but also the education of non-immigrant students, which is critical when considering inclusive and equitable quality education and promoting learning opportunities for all.

Through teachers' and immigrants' accounts (through the voices of Venezuelan immigrant Frida and Ricardo and the Haitian Max, Toni and Julius as well as mathematics teachers Markus and Miguel, who work with immigrant students from many different countries), this paper aims to discuss racism and stigmatisation with reference to mathematics education. The data captures multiple dimensions of immigrants' and teachers' lived experiences as people who participate in multiple communities and bring their histories into the mathematics classroom. Their reports will run through all discussions throughout the paper. The intention is not to analyse the reports themselves but rather to have a reflective dialogue in

[101] See more in: https://www.globalgoals.org/

the voices of research participants, theoretical framework scholars, and myself moving between theorizing and reflecting inclusive mathematics education and racism.

The basic education system in Brazil sets the particular context we will consider. The intention is to present some interview excerpts that give an impression of what is taking place in social and school contexts. Such discussions can give us inspiration for how to address possibilities based on mathematics education for social justice in diverse classrooms. In such classrooms, immigrant and non-immigrant students should be able to get to know one another in collaborative learning spaces that discuss controversial themes of social aspects such as racism and xenophobia[102].

7.2 Racism against immigrant people matters

Racism is part of a more extensive, structurally based racial system that is continually being brought up to date. It is a systematic form of discrimination that involves practices that produce disadvantages or privileges for individuals, depending on which racial group they belong to. Not only black people are victims of oppression by a racialised system. Latinos, Arabs, Persians, Gypsies, Jews, and Asians are included in this system (Bonilla-Silva, 1997; Marinucci, 2018; Romero, 2008).

Racism is premised on the assumption that subjugated people can be converted into "things" and subjected to dominance, alienation, or marginalisation. Dehumanisation of a particular group of people can be used to legitimise exploitation and social inequality. This has implications for what takes place in a classroom, just as classroom education can foster such a social order.

However, the impact that racism has on immigrant populations seems to be little explored in relation to mathematics education, which keeps important topics like diversity invisible. Mathematics education scholars explore the topic of xenophobia, despite not focusing on racism (Hauge et al., 2019). Other researchers have looked at the way in which racism operates during teaching and learning practices, taking into account the local meanings of race and the composition of racialised social systems (Valoyes-Chávez, 2018; Valoyes-Chávez et al., 2021; Valoyes-Chavez; Andrade-Molina, 2022).

[102] This paper is based on a PhD study that involved 14 participants, both immigrants and mathematics teachers from the Brazilian state of São Paulo. Brazil's current migration setting might be described as one of the most dynamic and varied in its history. For example, the number of immigrant students enrolled in primary education in Brazil almost tripled between 2010 and 2020. Through individual interviews, each mathematics teacher participant was invited to discuss their teaching experiences with immigrant students, while immigrant people were invited to share their experiences living in Brazil.

Critical mathematics education addresses concerns about differences in mathematics classrooms for all students. According to Penteado and Skovsmose (2014):

> A most direct example is the way in which some groups of people are prevented from having access to (certain forms of) education. For far too long such restrictions have been in effect in terms of racism: Blacks have been prevented from certain forms of education in the United States; during the apartheid regime in South Africa this type of injustice was exercised to an extreme; Jewish people were banned from educational institutions during a gruesome part of German history (p. 21)

One can say that the discrimination that immigrants go through has no racist foundation. One can argue that it is prejudice or discrimination, but not racism, and that any person might be treated similarly. However, segregation occurs silently behind the mists of meritocracy, and some people are more likely than others to face particular discrimination. This is related to racialisation in a social scenario. Saying that not every discrimination experienced by immigrants is racist does not minimise the urgency of paying close attention to the effects of racism on immigrant populations and the effects that this produces in social relations outside and inside school.

Most people associate racism with *overt behaviour*, which refers to noticeable, plain apparent actions. However, the racial practices and mechanisms can take the form of *covert behaviour*, with clandestine, behind-the-scenes actions (Bonilla-Silva, 1997). In addition, I identify *inert behaviour* as actions that are seen as neutral rather than concealing aggressive apathy, scorn, and disrespect in the face of racism.

Immigrants can be subordinated in a social logic impregnated with tensions of a racialised social system, a context guided by a dominant group (race) that can hold plenty of privileges and benefits in society. Racism is connected to xenophobia through nationalism. Xenophobia can be understood as an apparent behaviour involving hostility and violence. However, other tools can be used to maintain immigrant people in oppressor versus oppressed narratives. The disrespect and contempt of different cultures and the imposition of a way of life can also be considered. The disdain and fear are not just linked to skin colour. They might also be based on many other differences that characterise what might be considered a nation. According to Balibar and Wallerstein (2021):

> From an ideological point of view, current racism, centered among us on the immigration complex, is part of a "racism without races", [...] a racism whose dominant theme is not biological heredity, but the irreducibility of cultural differences; a racism that, at first sight, does not postulate the superiority of some groups or peoples in relation to others, but "only" the harmful character of the destruction of borders, the incompatibility of ways of life and traditions(Balibar; Wallerstein, 2021, p.56)

In the following, Frida states some discriminatory experiences she and her kids faced inside and outside schools in Brazil, and Leo and Max discuss situations at work. These are excerpts from interviews that were conducted individually.

Frida: I work with gastronomy on the streets, and I have already experienced someone coming to my stall and saying: “But you shouldn't be here. You should be in your country.” And I ask myself: “But why? The world is open to everyone, right?”. And the person thinks you are stealing someone else's job. But I'm not taking it. Everyone can work.

Leo: Another time, when I was working on construction, some colleagues joked: “Ah, this ‘faggot’ here, we need to talk to the president to send him away to his country!”. But it was a joke. We know that in Brazil it doesn't work that way. They had lots of jokes. It's normal. But there were others who were serious. They said that there are so many Haitians in Brazil, which is creating a lack of jobs. And I know that Brazil is a very big country, that there are lots of opportunities.

Max: I think these discriminations have to do with my skin colour, yes. I've worked at about four different companies. And I perceive the treatment to be different. Like I said, if there is a heavier job or a more disgusting one, you can be sure they'll call one of us. I’m not saying I won't do it. Wherever they call me, I always go. There's a way for everything. But you must be respectful. If you are black from Brazil, you go through some situations. If you're black from Haiti, it's even worse.

Max: I have several proofs (experiences). I remember that I went to get my documents, I won't mention the name of the place, and people treated Haitians differently from how they treated other foreigners, Japanese, German, American, for example. The way they treated each foreigner was different. It was possible to see the way they received people. I don't have a word in Portuguese to describe it. We know when the person treats them differently.

Frida: At one moment during the pandemic, I was talking to a school mother about the issue of emergency aid and how difficult it was to get. And she said she didn't think it was fair. But I don't think she thought before she spoke. She said she thought it was not fair for foreigners to receive emergency aid. Or for us to have same help as the Brazilians. I explained that this was a general situation. If there was a foreigner in a stable situation who didn't need it, that would be ok. But there are many foreign people as well as Brazilian people who need it.

Julius also reports experiences of racism that he experienced in Brazil and points out the subtleties involved.

Julius: Even though one doesn't say it to you, a gesture can say everything. For example, you are on a bus. There's an empty seat next to you and you notice that the person avoids sitting there. The person even prefers to stay stand. I remember one time I went to the mall. On the way out, there was a parked car and a child with his head out the window. When I was passing by, the man in the car quickly closed the window (laughs). You don't need to think too much:

> it's a white guy who doesn't want to see a black guy pass by his son (laughs). That's it. And I think the fact of being an immigrant weighs more than the fact of being black. Because being black, people feel less frustrated when they are in their country, they have fewer problems. I am proud to be black. But If I were in Haiti with everything I have here, it would be much better for me.

Miscegenation in Brazil projected the international image of a racially democratic country (Guimarães, 2001). Thus, many Brazilian people believe that racism is not a significant problem in Brazil and that discrimination results from economic disparities. They cannot recognise themselves as agents that contribute to maintaining a racist social *status quo* and deny racism as a factor that causes social inequalities (Bonilla-Silva, 2003; Silva; Paixão, 2014).

However, Frida, Julius and Max's reports disclose the fallacy a racially democratic and immigration-friendly Brazilian environment. Such features are contested when someone says to Frida: “But you shouldn't be here. You should be in your country”. And when Max perceives getting different treatment when he is always chosen to do the heavier or more disgusting job at work. Such reports do not illustrate just a few lone situations. They illustrate structural social exclusion based on racism that is the basis of Brazil's historical formation. As Julius said: “If I were in Haiti with everything I have here, it would be much better for me.” This matches with what Max said: “If you are black from Brazil, you go through some situations. If you're black from Haiti, it's even worse”. He also claims: “It was possible to see the way they received people. I don't have a word in Portuguese to describe it. We know when the person treats them differently”. Perhaps one possible word to describe such a situation is racism.

Ricardo tells his perception about what he imagines of the Brazilian receptivity towards the Haitian immigrant in comparison with the Venezuelan immigrant:

> *Ricardo:* I think that if my family and I were a black Haitian family, we would be received in the same way here in Brazil. I think it's the same here and, in my country, (Venezuela). I don't think there's much of that racism. Racism is not just against black people; it's also against white, indigenous people. There are many types of racism. But I didn't notice any kind of racism. I think Haitians are also welcome here. Also, because their language (French) is much more different than ours (Spanish) compared to Portuguese, I think it might be more difficult for them.

He also adds:

> *Ricardo:* Yes, not everyone, but some immigrants face xenophobia. Especially those who do the wrong things. There are many immigrants, not only from Venezuela, but also from other countries who come here and can't find a job, or don't want to work. Then they start doing wrong things, using drugs, prostitution. These people end up being judged as well. So, I think there are

> about ten per cent of immigrants who came to do everything right, but they can't and end up doing the wrong things. Then many suffer from xenophobia; some rightly so.

The difference in perception and experiences reported by Max, Julius and Ricardo point to a visible racial inequality in Brazilian structured in *pigmentocracy*[103]: lighter skin tones being privileged over darker skin tones. Those with lighter skin tones (like Ricardo) are frequently seen as more desirable, clever, and successful, whereas people with darker skin tones have a greater chance of suffering exclusion and violence (like Max and Julius) (Silva; Paixão, 2014; Telles, 2014; Devulsky, 2021). Thus, the experiences of Max and Julius seem far from those lived by Ricardo, who even understands racism and xenophobia as a deserved punishment for some of those "badly behaved" immigrants.

Teachers Markus and Miguel report situations and perceptions related to racism against immigrants in mathematics classes.

> *Markus:* And we are a racist, xenophobic, sexist country. So, it happens all the time. There are students that we try to include. But we have discrimination in a room with a lot of Haitians. Brazilian students feel that they have to be given priority over Haitian students. [...] We also witness looks, "faces and mouths". I hear: "Hey teacher, I don't want to attend classes in rooms with many Haitians"; "Why don't they stay in their country?"; "Why do they come to take our jobs?"

> *Miguel:* The acceptance is not the same. What I perceive is that there are some differences—for example, if the student is of Bolivian origin, acceptance is different if he is Angolan or Nigerian or if he is Muslim. Acceptances are different in different contexts.

> *Markus:* There was a girl who mentioned that she needed to find a boyfriend. I suggested that there were many boys at school. She replied that she didn't want a Haitian one: "Ah! God forbid dating a Haitian!" One of them (a Haitian student) asked: "Why don't you want to date a Haitian?". And she was embarrassed and didn't answer. We know it has something to do with xenophobia and racism.

These statements portray some of the social scenarios of racism and xenophobia immigrants face living in Brazil. In some cases, they are covert manifestations, like when teacher Markus states: "We also witness looks, 'faces and mouths'". Nevertheless, in many situations, racism can manifest in overt, explicit ways, like when the student declares: "Ah! God forbid dating a Haitian!" or when students say: "Hey teacher, I don't want to attend classes in rooms with many Haitians"; "Why don't they stay in their country?". There may

[103] Pigmentocracy refers to a social hierarchy or system of privilege and discrimination based on the color of a person's skin. See more about pigmentocracy in Chapter 2.

also be inert manifestations by those witnessing the situations and remaining neutral or apathetic toward such racist manifestations. Overall, there are perceived variations of racist attitudes with murky, cynical, and negligent manifestations.

In the following, teacher Markus reflects on how his students perceive themselves in racist situations, and the Haitian Toni reflects on what might be behind the racially democratic and immigration-friendly behaviour he experienced:

> *Markus:* And oddly enough, Haitians don't seem to understand that they suffer from racism or prejudice. They don't see themselves as people who suffer from prejudice. They think they are not victims. They respond that they have never experienced racism when asked. There's no way not to notice, but they think that's normal.
>
> *Toni:* There was a woman who kept looking at me. I don't know if it's because of the things they hear from Haiti. At that time, I didn't know how to speak Portuguese well. But I realised that she was available to help with everything, but I saw that it was out of pity that she helped. I thought: “Wow, Brazil is a country that welcomes people very well”. But not everyone is the same. But I feel like I'm welcome here. But now that I understand a little and see that people have pity, they help out of pity.

Most of the time, immigrant people in Brazil cannot even recognise themselves as victims of racism and xenophobia. It has to do with racial hierarchies being internalised beneath the veil of racial democracy in Brazil (Telles, 2014; Silva; Paixão, 2014). Social apartheid occurs in a so-called "Brazilian style racism" (Telles, 2003) in which racial mixture and racial inequalities coexist as equally essential facets of Brazilian race relations structured in an organisation system based on pigmentocracy. In this sense, social borders are established even under the veil of migratory receptivity that hides a sense of superiority toward the *Others*[104] (the foreigners), which is presented in Toni's report: “But I feel like I'm welcome here. But now that I understand a little and see that people have pity, they help out of pity”.

Miguel stresses that diversity in mathematics classes does not affect just immigrant students. There are regional differences within regions of the country, as well as differences in the student's physical, cognitive, and economic capacities.

> *Miguel:* In addition to international immigrants, the school has a lot of national immigrants. We have many North-Eastern children as well. And they end up fitting into that profile, something that draws a lot of attention. This issue of xenophobia is not just for foreign migrants but also for Brazilians who come from other states, especially the northeast region. I remember that immigrants were discriminated against by speech, accent, by the type of clothes they wore.

[104] See more about *We-Other dichotomy* in Chapter 4.

What Miguel reports has to do with the fact that the population of the north and northeast regions is composed mainly of blacks and indigenous people. At the same time, other parts of the country are dominated by European immigration. In this sense, students from such regions, when moving to São Paulo, may face negative and pejorative attitudes because the regional segregation and the caricature of the north and northeast population are based on racism (Telles, 2014).

Racism against immigrants matters, and it must be the subject of study for mathematics education in order to create more inclusive spaces. In the following, I discuss how racism reverberates in the stigmatisation of immigrant people.

7.3 Racial stigmatisation

Racial prejudice fosters biased attitudes toward members of a particular racialised group based on stigmas, which may lead to discriminatory practices. According to Goffman (2000), the social construction of stigmas is a mechanism that places people in a position of disqualification from full social acceptance. Through stigmatisation, specific characteristics of people from certain groups are considered defects, weaknesses, or disadvantages. An attribute that stigmatises a group can confirm the normality[105] of others.

Stigmatisation occurs when people attach negative labels and stereotypes to certain people. Stigmas establish how people should be, which can be considered natural and “normal”. This can result in the marginalisation of groups of people. Stigma, therefore, consists of a social and institutionalised image based on negative stereotypes. Stereotypes can play a central role in developing, maintaining, and perpetuating stigmatisation.

The sociodynamics of stigmatisation are related to structural racism. This implies that stigmatisation extends beyond the individual display of prejudice and accentuated contempt for the “Other”. Such a dynamic is structured in racism since the differences of certain groups are seen as derogatory so that the normality of other groups is praised. Accordingly, identified brands are created to define categories of belonging.

Such stigmatisation and prejudice include views of blacks as aggressive and dishonest, as well as Jews as greedy people; indigenous people as lazy or Asian people as "naturally" gifted at science, for instance (Almeida, 2019; Custódio, 2020). One can have stigmas concerning north-eastern or southern Brazil, Arabs and Jews, Portuguese and Argentine people,

[105] See more about normalisation in Chapter 9.

indigenous and immigrants. The stigmatisations in a racist order are and were at the root of political intolerance and wars—for example, the Nazis' justification for the holocaust was the image they had of Jews.

Paying attention to immigrant people, several mechanisms can be created to maintain a racist and xenophobic dynamic of stigmatisation. Social labels are created in line with particular characteristics of immigrant groups to shape social patterns. They can interfere with people's imagination of and social relationships with people from certain countries. Max reports how he sees Haiti being portrayed on social media:

> *Max:* I know that Haiti is not a rich country. It has a lot of ugly places. But it also has a lot of beautiful places, which are the postcard pictures for the country. So, a person hardly ever reports on Haiti showing these places. They go there looking for an uglier, more devalued place to show the country. Some people also go to show the beautiful places there. But it's more complicated. And then people always comment: "Wow, how sad! Haiti is a poor country." People ask if it's hard to have food there. I understand that people have reasons to talk like that.

In another moment he adds:

> *Max:* People think that Haitians leave their country because everything is more difficult in their country, they cannot survive in their country and that they go to another country for better living conditions. And that's what goes through people's heads, you know? This might even be true. This is the case for many Haitians. But not all people are in this situation. This is not my case.

Max's statements lead us to reflect on how the local population can perceive immigrants' origin countries. A feeling of underestimation and superiority may permeate the imagination and discourses of non-immigrant people when referring to "Other" populations. On many occasions, immigrants from certain countries may be seen as inferior. According to Max, this perception appears to be strengthened by media that is based on proposals to disseminate stigmas and stereotypes that reinforce paradigms of hierarchies between countries.

Toni accounts that people in Brazil have a stigmatised perception of Haiti and assumes that he also had a different perception of Brazil before moving.

> *Toni:* People see things on TV, showing that we cannot eat. There are people who ask me this question here: Is there water there? Is there rice, or are there beans? I think: Wow! It's a country. There is everything. People think Haiti is a country that has nothing. In my country, I lived better than here: my house, and car, were better. My house was twice as big as the one where I live today. But the same thing happens with regard to Brazil. My friends from Haiti ask what I came to Brazil to do. Because whenever you get news from the country it's about the bad places. There, they only hear about Rio de Janeiro and the favelas. When I arrived here, I was pleasantly surprised. It's totally different than what I imagined. Too bad the government doesn't understand what a wonderful country we have. [...] I often see people from

> Brazil who only know things about Brazil. Then when they ask, I show pictures, videos from the internet, beautiful things from Haiti.

Elias and Soctson (2000) carried out studies on a small community in England, looking at the relationship between a long-term established group and a younger group of residents (which they call “outsiders”). It was noticed in this study that the exclusion and stigmatisation of “outsiders” by the established group were powerful weapons for the latter to assert its superiority, keeping others firmly in their place of subordination. As a result, stigma served a vital function in identifying people who belong to a group and those who do not, or "insiders" and "outsiders".

Immigrants, when moving to another place, can receive symbols that characterise them from the people who are already established in this place. Frida, for example, reports what stigmas can give to refugee people:

> *Frida:* When I say I'm a refugee, people say that's a very strong word, that must be difficult (my situation). As if I were a poor thing. But over time, when we start talking and after they see what we've become, they're proud of who we are. Then they understand what the word refugee means, they start to have a different view.

Frida reports how a person's immigration status can influence the way local people may regard them. Being a refugee seems to bring a social stigma that leads to inferiority and discredit. Furthermore, the stigmatised people are likely to feel that they are "on display", being constantly evaluated. The statement, "But over time, when we start talking and after they see what we've become, they're proud of who we are", might reflect Frida's concern to overcome the stigma of being a “poor thing”, of immigrant people in refugee situations being seen as weak.

Stigmas and stereotypes that depict an immigrant (vs. someone native-born) are generally associated with lower power and status in many societies. They might be based on features such as reasons for migration (voluntary vs. forced) and legality (documented vs. undocumented) (Savaş et al., 2021). They are the result of intersecting power relations, such as related race, religion, gender, sexual orientation, and country of origin. They reflect on social status and borders by constituting desirable and unwanted categories of immigrants[106]. Ratings of racial minority groups may vary on dimensions of perceived inferiority and cultural foreignness.

[106] See more about desirable and unwanted immigrant people in Chapter 3.

Teacher Markus accounts for his perceptions of how his students would be treated differently according to their origin countries. He describes stigmatisations and stereotypes that immigrant students would or would not face, according to their nationalities:

> *Markus:* Oh! It would be totally different if they were American, German or Japanese, for example. There's the issue of skin colour, right? And then there's the stereotype issue. People are very social and status oriented. In the stereotype of the Haitian, it is difficult to see a successful and wealthy person.

One can reflect on Markus' statement and raise questions like: Why do Haitian people occupy this space of unsuccessful and non-wealthy people? How is people's importance or worth valued? How can stigmas resulting from racialised social systems contribute? How does the status or privilege associated with the various intersecting categories affect the views of the immigrant group? Hierarchies between countries and between immigrant populations are certainly not only sustained by economic paradigms (Stasiulis et al., 2020; Rosenberg, 2022).

Stigmatising is an essential element for exclusion in mathematics classes. Moore (2021), for instance, calls attention to how intersectionality may be applied in queer students' participation and addresses the threat of stereotypes during their mathematics classes. This is related to motives and desires for students to excel in mathematics in order to build ownership of an identity that is socially coded—describing a particular kind of students who succeed in mathematics.

The discourse of stigmatisation emerges from employing profound labelling of students' traits. The division between groups of people is permanently inscribed in the discourse of existence. Racism exemplifies the most brutal form of stigmatisation, and one can imagine many contexts where this notion would be crucial to the formulation of students' and teachers' experiences (Penteado; Skovsmose, 2011). Such a situation should be the focus of mathematical investigations to reveal specific elements of injustices.

7.4 Reading and writing a world of immigration with mathematics

Eric Gutstein (2003; 2006; 2016) addresses the challenges of working with socially disadvantaged students. Mathematical investigations have the capacity to reveal specific elements of oppression, exploitation, and injustice. For Gutstein, students need to be prepared through mathematics education to investigate and criticise injustice, and to challenge (in word and deed) oppressive structures. That means teaching and learning mathematics for social justice.

Furthermore, mathematics for social justice requires us to read and write the world with mathematics. By reading the world with mathematics, we mean students learning that mathematics can help them understand “what surrounds them”. By writing the world with mathematics, we are referring to students working together and finding solutions to problems. Students can engage in social change. They can, in a sense of belonging, recognise themselves as agents of transformation and use mathematics to modify reality.

For reading the world with mathematics, Gutstein advocates for making topics generally considered as taboo in school—like racism, sexism, brutality against immigrants, gay marriage, elections, abortion, and climate change—part of classroom life. Taboo subjects in school correlate with issues which are generally understood as controversial. *Controversial issues* are defined as those which arouse strong feelings and divide communities and society. They are often social, political, economic, or ethical issues (Kerr; Huddleston, 2016). For Skovsmose (2016; 2019), we can use critical mathematics education to discuss these issues, showing concern for the experiences of different groups of students, and enabling teaching and learning about social injustice and oppression.

Hauge, Kacerja, and Lilland (2019) consider controversial issues to be crucial in mathematics classes. They create democratic situations for students to develop critical thinking, toughen disagreement, and enhance their respect for others’ opinions, which is essential in a democratic environment. Furthermore, such issues may enable them to develop greater awareness, knowledge, and understanding of the socio-political situations in which they live. According to Gutstein (2006), it is not enough just to see the problem—we must understand why the problem is occurring.

To create a pedagogy of questioning, Gutstein advocates for creating a space in which students have opportunities to pose their own real, meaningful questions about issues of socio-political importance, fairness, and equality. Moreover, to develop political relationships with students, mathematics teachers must take active political stands in solidarity with students and their communities about issues that matter.

For instance, Gutstein proposes a real-world project named “Racism in Housing Data?”. When participating in this project, students should debate and ponder on whether racism played a role in arranging house prices in a Chicago neighbourhood. The students should gather data and investigate cost of living, appreciation and depreciation, taxes, income, employment, education, race, and social class—all within the context of a complex interaction with mathematics. According to the author, this initiative increases students' ability to use mathematics to explore inequities in opportunity across various social groups.

Using mathematics to discuss controversial issues may increase political engagement and avoid polarisation towards extrapolating possible echo chambers, which occur when ideas, opinions, and beliefs are reinforced by repetition within a group. In this sense, school mathematics must serve not just as a window through which to see the outside world but also as a mirror through which people see themselves and their families (Gutiérrez, 2007), which means ensuring that students see themselves and their communities reflected in the contexts and tasks. Controversial issues have a tendency to divide society. Thus, in contexts where diversity involving migration can intensify exclusion and violence, the consideration of such issues may be crucial when educating students for tolerance and anti-racism.

Teacher Naomi discusses her experience of working on topics such as racism and xenophobia in her mathematics classes:

> *Naomi:* As my classes are in mathematics, we are more focused on certain knowledge (technical knowledge). And there are other classes that are more focused on these (social) issues. They (the students) do not report anything because I think there is no time to get into this subject of racism or xenophobia. We don't have a moment to give them (the students) an opportunity to report something. In literacy and in the areas of History and Geography, they have more space to make these reports. In mathematics, there was never any report. I think the focus ends up being different for us. There are areas of knowledge that further explore this issue of racism. I never explored that area.

Naomi shares her understanding of the disconnect between mathematics classes and controversial issues. According to her understanding, these issues are more relevant to other subjects in school. Indeed, working on controversial issues in mathematics classes introduces several challenges. Topics may be difficult to handle in classrooms, and teachers may be reluctant to discuss such complex issues where students have divergent opinions, as this may arouse strong emotions, create unforeseen circumstances, and possibly evoke negative responses from parents. Furthermore, students may support ideas not in line with ethical standards in school or society (Hauge et al., 2019).

Despite such concerns and uncertainties, mathematics may be used to effectively teach and learn about issues related to immigration and social injustice, as teacher Miguel discusses in his account:

> *Miguel:* I guess that in mathematical thinking, if we were to stop to think, the logic you use to solve problems can be opened up in the sense of remedying conflict issues. Because if the person is critical, they will better understand the context and understand that this issue of xenophobia or discrimination is not something acceptable. It is a crime and cannot occur. In general terms, regardless of whether we think of mathematics as curriculum or content, in essence, mathematical thinking focused on solving problems (in the sense that

> you understand the context, analyse the problem, and propose solutions) is essential. Because it's something you use to prepare for life. In our lives, we deal with problems all the time. We need to analyse the contexts; we must make decisions. We need to see what the best decision is in that context. Mathematics contributes to this context. In life, learning is not just focused on specific content, but on how we solve problems. How do we solve problems? Working on this critical issue, I always ask students never to get caught up in the specific issue of the object but rather to understand the context in which it is inserted in the critical sense.

Frida indicates that mathematics is an essential tool for understanding reality, and teacher Markus shows how he has been trying to explore this in his mathematics classes:

> *Frida:* The indices (statistics) can be used on xenophobia and prejudice. You can see the percentage of the population that is being treated with prejudice. Mathematics helps us to understand reality.
>
> *Markus:* We show numbers of how bad and harmful this is. Holocausts, the number of deaths. People talk about Nazism, always showing numerically that racism, xenophobia, and machismo are bad for the world and society. Always showing numbers.

Anti-racist thinking interventions are necessary for education to lead us toward anti-racist actions and reparation measures (Ribeiro, 2019). As one example, Savaş et al. (2021) investigate how intersecting social categories shape views and stereotype content of immigrants in the United States. They identify several terms which the participants in the research used in rating immigrants, such as: scared, weak, hardworking, illegal, untrustworthy, religious, loud, accented, funny, alcohol drinker, and so many other labels showing their impressions about immigrants.

Reading and writing the world considering issues related to immigration is critical to broadening the school-centred discourse on mathematics education and addressing the diverse variety of out-of-school mathematics activities. Those possibilities go toward making inequitable classes into more equitable places through mathematics for social justice. For example, this can create space for discussions on distorted representations and stigmatisation.

One step towards doing so is to invite students to engage in investigative processes. A second step is to address controversial socio-political problems as an integral part of learning mathematics. In the subsequent sections, I address an imagined alternative project to discuss how controversial topics related to racism and xenophobia can be possible topics for investigation in mathematics classes.

7.5 *The beauty of diversity*

Pedagogical imagination looks at possibilities of action in the mathematics classroom for an inclusive teaching perspective (Lima, 2022). It is possible to design the *imagined hypothetical situation* as an alternative to the existing current condition by arranging thoughtful situations in a critical perspective; the situation looks towards what could be (Skovsmose; Borba, 2004; Vithal, 2003; Skovsmose, 2009). According to Skovsmose (2023):

> Much research in mathematics education focusses on offering descriptions, quantitative or qualitative, of that which is taking place. To critical mathematics education, it is equally important to move beyond such descriptions and to formulate pedagogical imaginations, which conceptualise alternatives to what can be observed and described (p. 211).

Thus, through pedagogical imagination, I address possibilities for mathematics classes reflecting on the issues of immigrant people in the face of a current situation. One step is to create conditions to engage students in the formulation of how stigmas and stereotypes could be related to social injustices, and also to be ready to challenge their opinions. I am inspired by the discussions of Barro (2021) and Brito (2013) in this process of imagination.

Barros (2021) investigated the possibilities of reading and writing actions in the world with mathematics in a space of the LGBTQIAPN+ movements in Brazil. He reflected on how mathematics was put into practice to understand the injustice and struggles faced by such a community, as well as the existing initiatives in search of a society that respects sexual and gender diversity. As part of the study, he investigated the Google results for the words “gay”, “transvestite?”, and “lesbian” and pointed out that there is still a lot of stereotyped information, including hypersexualisation of these people or reports of violence that denounce reality. The results show that negative representations could reinforce the restriction of these people’s possible futures to negative experiences.

Britto (2013) planned mathematics classes based on an investigation into black people's visibility in Brazil. He proposed to the students in the final years of elementary school an investigation into the appearance of black people in printed media. Students were encouraged to examine if this sort of media provided equal space for black and white people. As a result, black people's invisibility was highlighted and where they did appear in pictures, this was often in a negative context.

Reflecting on these projects and the way people can be portrayed negatively, I am reminded of an advertisement I saw when I was taking a bus in a city in Austria. The advertisement was about a call for financial help for people in need. Not surprisingly, the person in need depicted in the ad was a black child. This advertisement also appeared in various spots

of the city. What caused me discomfort in the scene (Figure 29) was the oversimplified image of a particular type of person. This representation was not based on purely economic criteria. Why are black people often depicted in negative contexts? Why are so many of them actually in negative contexts? This influences people's imaginations and may foster stereotypes that need to be the object of reflection in educational spaces.

Figure 29: Black people in negative context

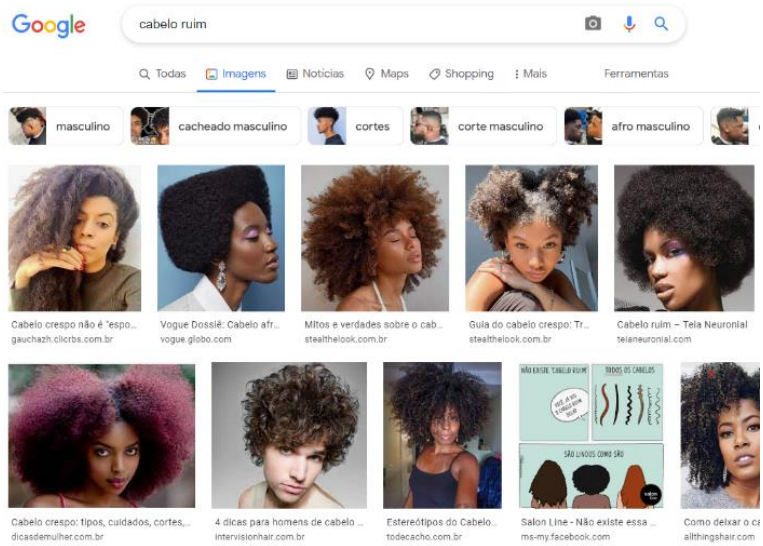
Source: Author's Archives

Nevertheless, one can say that such images just illustrate the unfortunate reality of a certain group of people. It is true that the images do not illustrate fictional situations. However, they only show one side of the reality—a reality that can be stereotyped or biased toward a negative and limited outlook. Thus, they contribute to the distortion in the population's imagination when faced with people from certain countries. This is reflected in attitudes that might activate or consolidate social stigmas that feed a racist social structure.

Inspired by the projects of Barro (2021) and Brito (2013), one might think of examples for mathematics classes with immigrant students in which mathematics plays a fundamental role in helping to analyse situations that foment stigmatisation. Statistical data may be used and helps show the potential of mathematics to carry out the studies. One possibility would be to create activities, under the assumptions of reading and writing the world with mathematics, in which students can be invited to investigate together on themes related to such context. This provides resources for making investigations and is characterised in terms of different concerns being interpreted and acted upon a social-political situation structured by mathematics.

In a class in Brazil, for instance, one can imagine students researching stigmatised groups, relating this to the negative characteristics imposed on them. Under the theme of *the beauty of diversity*, students can first search for results that appear on Google by entering the words *cabelos ruins* (bad hair) ou *cabelo feio* (ugly hair)[107]. Some possible results of images that could appear are presented below.

Figure 30: Negative characteristics imposed on hair.



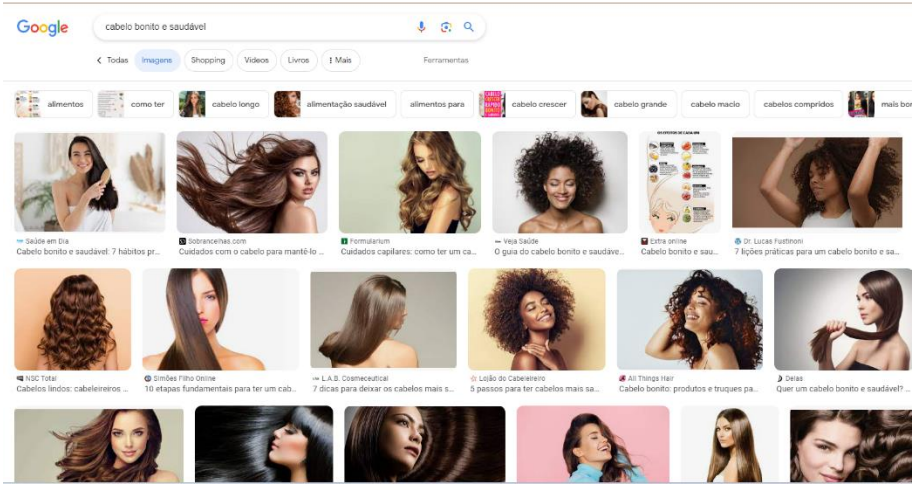
Source: Google Images[108]

In the same way, students can search for images related to the terms *cabelo bonito e saudável* (beautiful and healthy hair), in which the following image possibilities can appear:

[107] Different results may appear depending on the language used to search for images. The possibilities of images in the illustrations are results of the search made when using the terms in Portuguese in the region of Brazil.

[108] https://www.google.com/search?q=cabelo+ruim&tbm=isch&ved=2ahUKEwjIpd3XnvD3AhWRzqQKHZSpB5gQ2-cCegQIABAA&oq=cabelo+ruim&gs_lcp=CgNpbWcQAzIECCMQJzIFCAAQgAQyBQgAEIAEMgUIABCABDIFCAAQgAQyBQgAEIAEMgUIABCABDIFCAAQgAQyBQgAEIAEMgUIABCABDoGCAAQHhAHUKEWWN8bYJ8daABwAHgAgAGiAYgBpAOSAQMwLjOYAQCgAQGqAQtnd3Mtd2l6LWltZ8ABAQ&sclient=img&ei=gauIYojhGJGdkwWU057ACQ&bih=569&biw=1280

Figure 31: Positive characteristics imposed on hair.



Source: Google Images [109]

This example of an internet search carried out in Brazil confirms what research shows: that phenotype is not only defined by skin colour, but also by facial features and hair texture. Usually, straight hair is more socially valued in Brazilian society, while curly and kinky hair tends to be stigmatised or despised (Silva; Paixão, 2014). Socially constructed understandings of what is beautiful, pleasant, and even tolerable tend towards those with less pigmented skin. This not only affects the way people are perceived and treated, but also the people's life opportunities, as a reflection of a racist social structure. For instance, people with straight hair in Brazil have the highest average educational level (7.6 years); those with curly hair occupy an intermediate position (7.2 years), and those with kinky hair had the lowest educational levels (6.4 years) (Silva; Paixão, 2014). This statistical data can also be analysed with students in mathematics classes to reveal racial disparities in areas such as education. They can reflect on pigmentocracy in Brazilian society and how it is related to a system of privilege and disadvantage.

Faced with this current situation, through pedagogical imagination a mathematics class could be an environment for reflection on how Google's image search systems take into account various factors, including word matches, to display results. In fact, Google gives out racist results reflecting a social scenario. The stereotypes fostered by the images provide a link to a standard of beauty with characteristics of a certain dominant group. Thus, physical qualities

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https://www.google.com/search?sca_esv=566113270&sxsrf=AM9HkKnS268006UYmPPQ9ZXbyYdTnJNHWw:1694978359578&q=cabelo+bonito+e+saud%C3%A1vel&tbm=isch&source=lnms&sa=X&ved=2ahUKEwi91pi4rrKBAxXSQ7gEHexKAFUQ0pQJegQIDBAB&biw=1280&bih=563&dpr=1.5

considered beautiful and attractive are set out—and, consequently, so are the qualities considered ugly and disgusting.

Investigations on *the beauty of diversity* are presented as important to enable reflections on a socially racialised system such as in the Brazilian scenario. They illustrate the value attributed to immigrants, both black and non-black. Similar investigations can be made looking at *the beauty of diversity* in relation to the countries themselves, where the way different countries and immigrant people are represented on social media can be explored.

One can organise activities to be developed in a group, for example. Each group of students can study a country and present the results to the rest of their classmates. They can gather information about the way countries and immigrants are represented on social media, about which countries or groups of people are represented more negatively and which are represented in a more positive way. Searches on Google for words like “Haitian immigrants”, “Ukrainian immigrants”, or “Venezuelan immigrants” could be possible. Students can analyse how even countries experiencing war can be presented differently by the media. The information can be organised in tables and graphs or presented through proportionalities and statistics. Thus, the students develop mathematically based arguments for dialogue between them and the teacher and share their different points of view with one another. Students can conduct surveys, interviews, or opinion polls to understand people's attitudes and perceptions towards immigrants in their community or country.

The beauty of diversity can form a basis of understanding for *immigrant* and *non-immigrant students in mathematics classes*. In this investigation, students find space to share their experiences (if they wish) and raise questions about stigmas given to a certain group of people who struggle against exclusion at school. *The beauty of diversity* gives us a powerful possibility to read and write the world with mathematics, going beyond the denunciation of a racist reality, but also opens up paths for engaging immigrant students and non-immigrant students in action towards solidarity. It also enables us to look at a situation from another perspective in the search for overcoming paradigms that seek to make a community inferior and makes it possible for us to change attitudes and actions towards mathematics when perceiving motives to learn it. Furthermore, historical examples in which mathematics was used to justify racist theories can be used to encourage students to reflect on how mathematics can perpetuate or combat racism.

7.6 Final considerations

Stigmatisation, uncertainty, exclusion, conflict, power, and decision are all terms that can be used to outline the features of racism. Racism fosters stereotypes and produces xenophobic practices that can perpetuate the oppression and subordination of migrant populations. This makes it necessary to reinterpret mathematics education with immigrants, as well as to consider racism against immigrants, including non-black people. Additionally, immigrant students might face misconceptions that interfere with their ability to learn.

Overall, some findings from this research, show the necessity of considering immigrant students in mathematics classes going beyond concerns with language barriers. It is also necessary to consider the stigmatisation resulting from the devaluation of certain differences placed in terms of a socially racialised system. The definition of specific attributes considered important by one social group can lead to the marginalisation and contempt of another.

Actions favouring social justice cannot claim to be revolutionary if the racial issue remains in the background (Devulsky, 2021). The reality of daily racism reported by the immigrants and their teachers—both of whom were participants in the research—illustrate the relationship between immigrant and non-immigrant students in Brazil, reflecting convert and overt attitudes of racism and xenophobia.

Mathematics can play a double role in social scenarios. On the one hand, mathematics can support biased, racist algorithms that maximise and nourish stereotypes and stigmatisation of certain groups of immigrants. On the other hand, it can play an essential role in providing possibilities to understand the world critically, pointing out social injustices and what needs to be transformed in an immigration context.

Mathematics classes with immigrants can be a space to get to know each other in the direction of building respect for diversity, which includes overcoming a hierarchical view with a regretful look at the other person and their differences. Thus, it is critical to comprehend the context in which certain stigmas are formed and understand how some groups are stigmatised. Reading and writing the world with mathematics helps us to understand how this happens.

The beauty of diversity is an imagined proposal in the sense of creating space for immigrants and non-immigrants, together, to read and write the world with mathematics. Mathematics class as a future practice conceived by the pedagogical imagination is part of a critical educational effort. Imagination can be used to encourage future teachers to think differently about certain points, to renounce assumptions and allow them to think about possibilities (Lima, 2022).

The denunciation of social injustice goes towards the recognition and appreciation of people as they are and exist in the world. This means cultivating attitudes toward social justice and against racism through mathematics. Both immigrant and non-immigrant students can think critically by reading and writing the world with mathematics.

Mathematics education must be present in replacing an ideology of charity and attenuating the superficial consequences of the World Order, by repairing social injustice. By building mathematics educational possibilities, people can go beyond the limitations that a socio-political possibility has imposed on a group of people. Using inclusion, we can support the precepts that can direct social transformation and amplify students' humanity.

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8 MATHEMATICS EDUCATION FOR CITIZENSHIP: IMMIGRANT STUDENTS AS A VIEWPOINT

Manuella Carrijo

ABSTRACT:

This paper aims to propose conceptual investigations on mathematics education for global citizenship, focusing on the reality of immigrant students with an understanding of global community and with reference to structural racism. The lived experiences of immigrants and mathematics teachers provide valuable insights for an imagined landscape of investigation. The outlining takes place in three steps: (1) I discuss the contested features of mathematics education for citizenship; (2) I elaborate on what mathematics education for global citizenship could mean. This elaboration is guided by three structuring elements to imagine mathematics classes that go towards the inclusion of immigrant students: the notions of landscapes of investigation, lived democracy in education, and classrooms as learning communities; (3) finally, I present the imagined landscape of investigation *Global Mobility* as a possibility for mathematics classes considering immigration issues.

KEYWORDS: Immigration, Global Citizenship, Landscape of Investigation, Lived democracy, Classrooms a learning community.

RESUMO

Este artigo tem como objetivo propor investigações conceituais sobre educação matemática para a cidadania global, com foco na realidade de estudantes imigrantes com uma compreensão de comunidade global, tendo como referência o racismo estrutural. As experiências vividas por imigrantes e professores de matemática fornecem informações valiosas para uma paisagem imaginada de investigação. O delineamento se dá em três etapas: (1) discuto o caráter contestado da educação matemática para a cidadania; (2) elaboro o que isso pode significar para a educação matemática para a cidadania global. Esta elaboração é guiada por três elementos estruturantes para imaginar aulas de matemática que caminhem para a inclusão de estudantes imigrantes: as noções de cenários para investigação, democracia vivida na educação e salas de aula como comunidades de aprendizagem; (3) por fim, apresento o imaginado cenário para investigação *Mobilidade Global* como possibilidade para aulas de matemática considerando questões de imigração.

PALAVRAS-CHAVE: Imigração, Cidadania Global, Cenários para Investigação, Democracia Vivida, Salas de aula uma comunidade de aprendizagem.

8.1 Introduction

Mathematics education is commonly argued to be crucial for citizenship and is called upon for an ethical way of claiming democracy and citizenship. However, the idea of how citizenship could be configured and reinforced in mathematical practices remains underexamined (Chronaki, 2023). Carrijo (2014) points out how researchers in mathematics education use the term *education for citizenship* as a taken-for-granted notion, which has become a buzzword. The notion of citizenship is in need of further elaboration in mathematics education (Skovsmose, 2023) and enforced migration and transnational mobility brings even

more complexity to the topic of how mathematics education can develop citizens who can address global challenges.

The 2030 Agenda for Sustainable Development featured a plan, adopted by the United Nations (UN) Member States in 2015, based on Sustainable Development Goals (SDGs) for accomplishing a better future for all. Target 4.7 says:

> By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship, and appreciation of cultural diversity and of culture's contribution to sustainable development (United Nations, 2015, p. 19).

Cross-cutting concerns on this agenda include immigration and education for citizenship. The global indicator is the recommendation concerning education for international understanding, cooperation, and peace education relating to human rights. Such goals suggest restructuring in education that also may include reflecting on citizenship education through mathematical education.

Scholars point out several approaches to mathematics for citizenship. According to Skovsmose and Nielsen (1996), citizenship identifies schooling as preparing students to be active and critical in society. Popkewitz (2004) refers to a responsible citizen as someone who is willing and able to take responsibility for social problems, and propose possible solutions through mathematics. The notion of active citizenship related to responsibility in society is also mentioned by Maass et al. (2019) and Kaiser (2020). For Gutstein (2006), a citizen is able to "read and write the world through mathematics". Chronaki and Yolcu (2021) reflect on possibilities of mathematics education in relation to new visions of a globalised world through pedagogic relations, cultural practices, and local communities. Skovsmose, Moura, and Carrijo (2023) advocate for inclusive citizenship bringing awareness of engaging in dialogues across national, economic, cultural, and existential differences. Whatever approach mathematics education for citizenship may take, it reveals its contested and complex features.

In this paper, I aim to propose conceptual investigations (referring to studies that bring the applied key notions into focus) to address mathematics education for citizenship in terms of education for global citizenship. Global citizenship is a maturing concept in the context of mathematics education, which opens up several possibilities to be explored. I develop my reflections stimulated by the following question: *How can the educational intentionality for global citizenship be the driving force of a mathematics education that combines the reality of*

immigrant students with an understanding of global community, with reference to structural racism?

I will present some interview excerpts as illustration that can give an impression of the reality in social and school contexts in Brazil[110]. Some immigrants' and mathematics teachers' reports can give inspiration for addressing discussions and possibilities based on mathematics education for citizenship considering immigrant students. According to Seidman (2006), the root of in-depth interviewing is an interest in understanding the lived experience of other people and the meaning they make of that experience. This is crucial when exploring facts about the world and creating theoretical knowledge by interpreting the data.

The reports will run through all discussions throughout the paper. The intention is not to analyse the reports themselves but rather to have a reflective dialogue in the voices of research participants, theoretical framework scholars, and myself moving between theorizing and reflecting mathematics education for citizenship. The experiences of immigrants and teachers can provide valuable insights for imaginative exercises that could form a landscape of investigation.

8.2 Contested feature of mathematics education for citizenship

Mathematics education for citizenship is a contested topic of discussion. This is reflected in the variety of denominations and conceptual types used by scholars. Two reasons point to why mathematics education for citizenship is contested.

First, citizenship is itself a contested notion. It follows human interests and purposes based on ideals of belonging and non-belonging, and of favouring and disfavouring. Our understanding of citizenship changes as society changes and also as ideologies change (Carrijo, 2022). With the growing complexity of societies and socio-political changes, the concept of citizenship has often been used in different discourses and strongly influenced by, for instance, globalisation.

Second, mathematics can be a resource that serves diverse kinds of interests.. It has to do with the critical feature of mathematics, mainly because of what has been produced with this knowledge, which includes both wonders and horrors (Skovsmose, 2005; 2008; D'Ambrosio, 2011). In this sense, mathematics may be considered either as being subjected to systemic

[110] This paper is based on a PhD study that involved 14 participants, who were immigrants and mathematics teachers from the Brazilian state of São Paulo. Through individual interviews, each mathematics teacher participant was invited to discuss their teaching experiences, while immigrant people were invited to share their experiences of living in Brazil.

power and inequalities, or as an agent for social change. Accordingly, it is possible to have mathematics education for the purpose of citizenship with different aims

According to Skovsmose (2023), the contested feature of citizenship:

> might give the impression that citizenship is a bipolar notion, stretching out between critical and uncritical forms. In contrast, I see citizenship as a multi-dimensional notion with a diversity of possible interpretations. What kind of citizenship we should work towards and what conception of social justice we should engage with is a principal concern of critical mathematics education? (p. 235-236).

The contested character of citizenship takes place in multi-dimensional notions which can be highlighted if glimpsed through the lens of intersectionality. Intersectionality can emphasise the interrelatedness of different axes of oppression, and how they are mutually constitutive in social relations (Collins, 2015). In other words, some citizens may be considered more as citizens than others (Carrijo, 2022) and education for citizenship can be part of a context of dispute over the dichotomy of inclusion and exclusion that includes markers of social differences—such as sexuality/gender, age/generation, economic differences, cognitive differences, physical differences, and more—and produces distinctively privileged social statuses for certain groups.

Mathematics education for citizenship can be related to maintenance strategies but also to ways of coping with hierarchies based on differences (Skovsmose; Moura; Carrijo, 2023). Thus, citizenship is present in the purposes of mathematics education, even in variations of principles and ideals that are diversified according to the intentions and needs of a society characterised not only by historical, political, and culturally differences but also by power relations between the individuals and community.

Teacher Markus points out what he considers education for citizenship and how he sees mathematics relates to it.

> *Markus:* The student wants to improve his social condition; he wants to express his citizenship. He wants to be a more important person. He goes after mathematics to have better conditions for it. To take a civil service examination, to join the police, to enter college. The role of mathematics is to offer conditions for him to ascend socially.

Elsewhere he adds:

> *Markus:* And the more knowledge a person has, the more citizenship that person has. We say that knowledge is power. So, every part of education goes through mathematics. A person has to know mathematics to exercise citizenship, to get a job and to move up socially. Understanding how politics, economics

> works, to know how to save money, mathematics is in everything. I always try to say that mathematics is everywhere and you're going to need it.

Markus communicates his understanding on education for citizenship. He understands mathematics as powerful knowledge: “mathematics is everywhere and you're going to need it”. For him, mathematics education for citizenship has to do with social ascension: to get a job, to know how to save, to enter college; by moving up socially a person can express his citizenship.

Many different discourses and paradigms are involved in the understanding of mathematics education for citizenship. Chronaki (2023) discusses the paradoxes, tensions, or aporias in mathematics education when considering citizenship and draws attention to overcoming the subjection/agency binaries around such discussions, since they can create an exclusionary vision that some people are more likely than others to citizenship. Valoyes-Chavez and Andrade-Molina (2022) reflect that children may be welcome to become the desired citizen in the mathematics classroom; however, this can be used as a mechanism of invisibilisation which operates to maintain immigrant students as outsiders and invisible members of society, for instance.

Citizenship is not a matter of individual behaviour and attitudes only. Notions of citizenship reflect a complex social structure as well as legitimising discourses which serve to make discrimination appear natural and unquestionable. This should be seen as a concern within multicultural contexts, and interpreted in reference to structural racism in a globalised world of intense international immigration. Next, I focus on the discussion of global citizenship as a step towards thinking about preparing students to see the world beyond their local perception.

8.3 Global citizenship education through mathematics education

International immigration influences the way people perceive themselves around the planet. By meeting people from different parts of the world, people start to see the world beyond their local perception. The world is becoming more and more whole. Each part of the world, more and more, has been perceived as part of the world, and the world as a whole is increasingly perceived in each of its parts (Morin, 2002).

According to Morin (2002), when considering the human being or society as complex and multidimensional units, it is impossible to know the parts without knowing the whole, nor to know the whole without knowing the parts particularly. He states:

> The global is more than the context, it is the set of different parts linked to it in an inter-retroactive or organizational way. In this way, a society is more than a context: it is the organizing whole of which we are a part. Planet Earth is more than a context: it is the organizing and disorganizing whole of which

> we are a part. The whole has qualities or properties that are not found in the parts if they are isolated from each other, and certain qualities or properties of the parts may be inhibited by restrictions arising from the whole (Morin, 2002, p. 37, my translation).[111]

I consider that in a global community, each person has unique characteristics, behaviours, and interactions with other people, which can have a significant impact on the system as a whole. Considering individuality is essential for understanding social systems' complexities in a global community, as it provides insights into the behaviour and interactions of each person, which can have a significant impact on the behaviour and emergent properties of the system as a whole. For Morin (2002), the weakening of the perception of the global leads to the weakening of responsibility (each person tends to be responsible only for their specialised task), as well as to the weakening of solidarity (each person no longer feels bonds with other people). Significant human problems disappear in favour of particular technical problems.

It is on this understanding of the global community that I consider Global Citizenship Education (GCE) as an insight into mathematics education with concern for immigrant students. What can transform the students into citizens of the world through mathematics mean?

According to Akkari and Maleq (2020), a global citizen is someone who feels the responsibility to respect and protect the planet, has an understanding of the interconnected world, and deeply appreciates and values ecological sustainability and social justice. In other words, it is someone willing and able to take action to make the world a fairer place for ourselves and other living creatures.

GCE has concerns related to issues of collectivity, community, planet, economic, and social class, and concerns about how to create a curriculum for global citizenship education that is inclusive (draws from multiple perspectives), ethical, interconnected, and respectful of the student's own background (Akkari; Maleq, 2020).

Mathematics classes with immigrant students are spaces containing people with different life experiences, cultural backgrounds, and different fulfilled and frustrated dreams, as well as different hopes, priorities, opportunities, perspectives, and aspirations. Frida, who is Venezuelan talks about the process of moving to Brazil with her children:

> *Frida:* Total challenge, tiredness and being a warrior. Because it's a tiring process. No one came to you one day and said that you would need to leave (your

[111] Translated from: "O global é mais que o contexto, é o conjunto das diversas partes ligadas a ele de modo inter-retroativo ou organizacional. Dessa maneira, uma sociedade é mais que um contexto: é o todo organizador de que fazemos parte. O planeta Terra é mais do que um contexto: é o todo ao mesmo tempo organizador e desorganizador de que fazemos parte. O todo tem qualidades ou propriedades que não são encontradas nas partes, se estas estiverem isoladas umas das outras, e certas qualidades ou propriedades das partes podem ser inibidas pelas restrições provenientes do todo" (Morin, 2002, p. 37).

> country). Nobody prepared you for this. You come with a learning bag, a bag of things you can't just pass an eraser on, right? You just come loaded with so many things. And then you fight, and you adapt along with everything that comes along with you, all that knowledge, and adapt to what your life is today. So, tiredness is constant. It's not just culture. It is also questions of adaptation, questions of work, of study. These are questions that, perhaps in your own country, are different. You have a whole life in the making, from childhood to adulthood. And in the case of children, they have to understand why they are not in their countries, close to their family. And then you sometimes have to forget how you feel to help the children move on. And that is a constant challenge. And think what more am I going to be able to do and overcome every obstacle you have. So, as an immigrant mother, that's tough, it's constantly tiring. You look like a fighter every day. I have to fight things that I consider to be barriers. Knowledge barriers. Barriers you didn't even know about, but you have to learn to fight against them.

Frida points out "you come with a learning bag, a bag of things you can't just pass an eraser on, right?". This alerts us about the background of immigrant students that must be considered at school and, therefore, also in mathematics classes.

For GCE, education is about more than literacy and numeracy: it is also about citizenry (becoming a citizen). It works by supporting students to understand that these are global, not local, issues—and helps them become active promoters of more peaceful, tolerant, inclusive, peaceful, and sustainable societies (Akkari; Maleq, 2020). Global citizenship education is a response to the challenges of a planet that is increasingly interconnected but whose future is full of uncertainties. It means enabling students to actively engage in developing more inclusive and peaceful societies (UNESCO, 2021).

There are several ways in which global citizenship education and critical mathematics education can be connected and integrated. They share a common goal of developing critical thinking skills and fostering a critical understanding of social and political issues. I see mathematics education and global citizenship education together going to some conceptual domains, such as:

1. Knowledge and understanding of global issues: provide opportunities to illustrate mathematical concepts and processes by means of global issues and data to explore patterns and formulate ideas about the world of local-global people-environment relationships.
2. Cognitive, social, and practical skills such as critical thinking and analysis, problem-solving, reflection, communication, participation, and collaboration; use and apply mathematics to real-world problems and data (for example, international

development data, develop critical thinking around use, presentation, and manipulation of data.

3. Dispositions and values (e.g., empathy, tolerance, commitment to social justice): provide opportunities to consider the influence of different cultures on mathematics and develop skills relating to open and intercultural communication, alternative perspectives, conflict resolution, and respect for diversity.

The relationship between global citizenship education and critical mathematics education is complex and multifaceted, but there are several potential connections that can be explored to promote a more critical, socially engaged, and globally oriented approach to mathematics education. GCE aims to equip learners with the knowledge, skills, and attitudes necessary to engage with global issues and to be active and responsible global citizens. Critical mathematics education, on the other hand, is an approach to mathematics education that emphasises the development of critical thinking skills and the use of mathematics as a tool for social justice and political transformation.

Global citizenship education can promote the development of cultural competence and intercultural communication skills that are essential for effective mathematics teaching and learning in diverse classrooms. It can promote a critical understanding of the role of mathematics in global issues. Carrijo (2014) states that it is necessary to think about mathematics education for citizenship that considers global issues. This can help learners to engage in understanding global issues related to all kinds of students, as well as their underlying structures and power dynamics, to address global issues such as racism, poverty, inequality, and environmental sustainability and use mathematical models and data to make decisions about resource allocation or climate change policy.

Students critically examine the data they face in their daily lives and question their position in the world: How do lifestyles impact nature and climate change, as well as society? Through the study of mathematics, students can develop critical thinking skills and problem-solving strategies that can be applied to real-world problems. It leads students to challenge dominant narratives and power structures, and empowers them to use mathematics to address social and political issues.

Evans (2018) argues that more research is necessary to comprehend the theoretical underpinnings of the explicit connections between mathematics education and global education, as well as to provide examples of classroom activities that successfully combine mathematical content and issues of global (or national or local) significance. The author

indicates opportunities and challenges for addressing the objectives of global education in the context of K-12 mathematics classrooms. Oxfam[112] also discusses how great global citizenship foundations can be connected to mathematics classes.

However, there are concerns that mathematics for global citizenship may materialise in contexts with black students in a manner that keeps them in a place of historical marginalisation by considering them as other than human. Acooding to Valoyes-Chavez and Andrade-Molina (2022), “in fabricating the reasonable citizen, educational reforms acknowledge students’ differences but maintain mathematics at the core of schooling and categorize students according to their mathematics performance and skills” (p. 8).

Roux and Swanson (2021) claim that notions of the global and local, the citizen, mathematics, and mathematics education must be critically brought together to avoid inadvertently reproducing the inequities they seek to disrupt. According to Chronaki and Yolcu (2021), mathematics education can play a role in discursively implementing a differentiated mechanism that divides the "desired citizen" and "the other”.

Keeping in mind the possibilities and concerns, I come up with further elaboration on mathematics education for global citizenship through three notions: *landscape of investigation, lived democracy* and *classrooms as learning community*.

8.3.1 Landscape of investigation

Skovsmose (2022) claims that it is important to invite students into contentious landscapes of investigation, which means considering crucial issues as a topic for mathematics classes that could turn into a discussion of conditions for living and the profound inequalities that exist in society. In this sense, students have the chance to investigate situations they consider unfair through mathematics. This means creating other strategies that challenge the exercise paradigm[113].

Alrø and Skovsmose (2010) provide a classification of six learning *milieus*: while the *milieus* (1), (3), and (5) represent the exercise paradigm, the milieus (2), (4), and (6) represent landscapes of investigation. These environments are organised according to whether they refer

[112] oxfam.org.uk/education

[113] In the exercise paradigm, classes are dominated by training format pre-built exercises based on a sequence of orders. For instance, determine the values of x where the function f(x) is not continuous, check if the matrix is invertible, solve the polynomial equation by factoring, find the logarithmic expression value, and so on. The tasks contain texts with little relevant information and with the sole purpose of presenting the exercises. In many cases, these have only one correct answer that can be found without requiring any further critical or creative thinking. This paradigm supports school mathematics tradition, mathematics on foundations of reason, that inspires unique truth and superiority to other knowledges (Skovsmose, 2011).

only to pure mathematics to a semi-reality, or to real-life references. Therefore, exercise paradigms and landscapes of investigation together set a range of possibilities for tasks and strategies to focus on, creating different learning environments. An interconnectedness of issues can be addressed on different scales with learning milieus and in different contexts. Once can work on mathematical subjects based on local issues or go further toward global issues.

Landscapes of investigation are an essential feature of critical mathematics education, providing learning environments that go beyond the exercise paradigm. Landscapes of investigation are learning environments that support investigative work. They provide possibilities for shared investigation processes and encourage students to investigate a problem that they consider important (Skovsmose, 2022).

According to Carrijo (2022), when considering the landscape of investigation combined with the perspective of global citizenship education, one must consider expanding the issues discussed and the possibility of engaging with global issues. When thinking about education for global citizenship, the landscapes of investigation can expand the borders of mathematical contents to be instruments of critical reading of a globalised world. For Markus, is important to address social issues in mathematics class as well:

> *Markus:* You hardly ever have a Haitian who doesn't know the four operations. Most of them master the four operations. And from there it is easy, you just need to teach the new concepts. But the coolest thing is trying to get them to read the problems. They ask about the meaning of certain words. Mathematics takes a backseat. The class is about mathematics, but for immigrants we teach language, communication, public policies, solidarity, citizenship and education.

However, for the teacher, unlike other learning environments in which it is possible to discuss other topics such as communication, public policies, solidarity, citizenship, for him it is as if mathematics “were outside”. This may be related to the tradition of school mathematics. It is not just about addressing the social issue, but the way in which mathematics understands controversial issues.

Landscapes of investigation can turn into spaces for global citizenship education. These landscapes are spaces for discussions about human rights and social reality, including real contexts, exploring, questioning, and making proposals; detecting bias, opinion, and stereotypes in own and others’ thoughts, words, and actions; identifying tension and consonance in complex issues, problems, and questions. Students might construct viable arguments, critique the reasoning of others, and come to engage in making social changes.

Immigrant people may have different ways of thinking about and approaching mathematical problems, and they may have experienced different education systems or

mathematical practices in their countries of origin, which can broaden landscapes of investigation in mathematics education. Bringing these perspectives to the classroom can give students a more diverse and comprehensive understanding of mathematics, and recognition of the importance of diversity and multiple viewpoints. By promoting understanding and respect for different cultural perspectives and practices, mathematics educators can create learning environments that are more inclusive and supportive of all students.

8.3.2 Mathematics classrooms as learning communities

For Watkins (2005), in classrooms that operate as learning communities, the aim is to advance collective knowledge and, in that way, support the growth of individual knowledge. In this sense, the growth of knowledge involves individual and social processes in a shared view of knowledge. The social and learning goals advance together through all participants.

Frida draws attention to the right to mobility between countries. When she says, “the world is open to everyone, right?”, she brings elements that refer to an understanding of the world as a global community.

> *Frida:* I work with gastronomy on the streets, and I have already experienced someone coming to my stall and saying: “But you shouldn't be here. You should be in your country.” And I ask myself: “But why? The world is open to everyone, right?”. And the person thinks you are stealing someone else's job. But I'm not taking it. Everyone can work.

Askew (2015) claims *mathematics classrooms as learning communities* means welcoming diverse contributions, playing down differences, and promoting inclusion. Learning communities are models of democratic education. “Developing learning communities means providing opportunities for engaging with mathematics that are authentic, start from mathematical activity and processes and are structured to support mathematics to emerge” (p. 138).

Mathematics classroom communities involve care and reciprocity focused on learning. They also provide a space for individual and collaborative endeavours for students to engage productively with mathematics (Walshaw; Anthony, 2008). They are organised around the principles of collaboration, participation, and shared responsibility for learning.

Such learning environments may be focused on building a perception of oneself as part of the global community, which includes an awareness of other perspectives and helps build a sense of social responsibility and solidarity towards less privileged groups of people. By creating mathematics classrooms as learning communities, where all learners are valued and

supported, immigrant people can feel more included and invested in their learning: each one is part of the group within the learning community they engage in.

8.3.3 Lived democracy

Hauge, Werler and Herheim (2022) address *lived democracy* to refer to education for and through democracy. According to them, students are still learners in the process of increasing capacities for future citizenship and future lived democracy. Critical thinking, communication, developing argumentation, being empathic, and taking responsibility are central capacities for lived democracy in education.

> Facilitating young learners' lived democracy in education is about making education relevant to them by including topics and open-ended real-world problems close to their daily life, and particularly topics in which they have some experience and which matter to them (Hauge; Werler; Herheim, 2022, p. 185).

Lived democracy refers to educational practices where students are engaged with challenging and controversial shared topics—rooted in the local community—that are truly meaningful for them. It refers to situations where students may appreciate their freedom of speech, present argumentation, and express their opinions. They may add different perspectives while learning from other viewpoints and develop acceptance that others may not share the same opinions and values as them.

Lived democracy in mathematics education may support critical thinking related to the way numbers are used in the debate on racism and xenophobia. Its absence may have effects on the classroom community in the sense of a lack of concern for developing the students' abilities to protest and prevent racism and anti-democratic attitudes regarding immigrants, for instance.

Students can move beyond the position of receivers of information and instructions, and move toward being able to criticise, evaluate, understand, and provide input to the democratic learning space. Lived democracy is based on mutual respect, tolerance, individual freedom of faith and speech, respect for disagreement and free elections to face challenges in accordance with democratic principles.

Moreover, this has to do with contexts of immigrant students struggling for liberation from oppression and racism. The history of democracy in Brazil is filled with examples of exclusions and brutal marginalisation. It makes perfectly good sense to talk about structural inequalities, considering structural racism as one manifest example.

Teacher Naomi claims that it is important to look at issues experienced by other students or by other groups of people in mathematics classes:

> *Naomi:* So, this exchange of experience between students is very rich. Because sometimes people think they are right about their opinion on an issue that is happening here in Brazil. Here comes another person who says that in her country it is different. And this comparison that is made of how it is there: the question of how the education is, the economic issues. All these subjects that the agent addresses, the student also brings his experience. He has the voice and shares with everyone in the room what he brings to knowledge about that. This exchange of experience, I think, is very positive.

This points to the importance of non-immigrant students addressing problems experienced by immigrant people and vice versa. Inclusive and democratic approaches to mathematics education go toward highlighting the importance of diversity and collaboration. By embracing diverse perspectives and experiences, mathematics educators can create learning environments that are more inclusive and supportive of all students.

Miguel reports that immigrant students are curious to get to know immigrant students, although the students' curiosities, according to what he points out, are guided by patterns that seem stigmatised[114]:

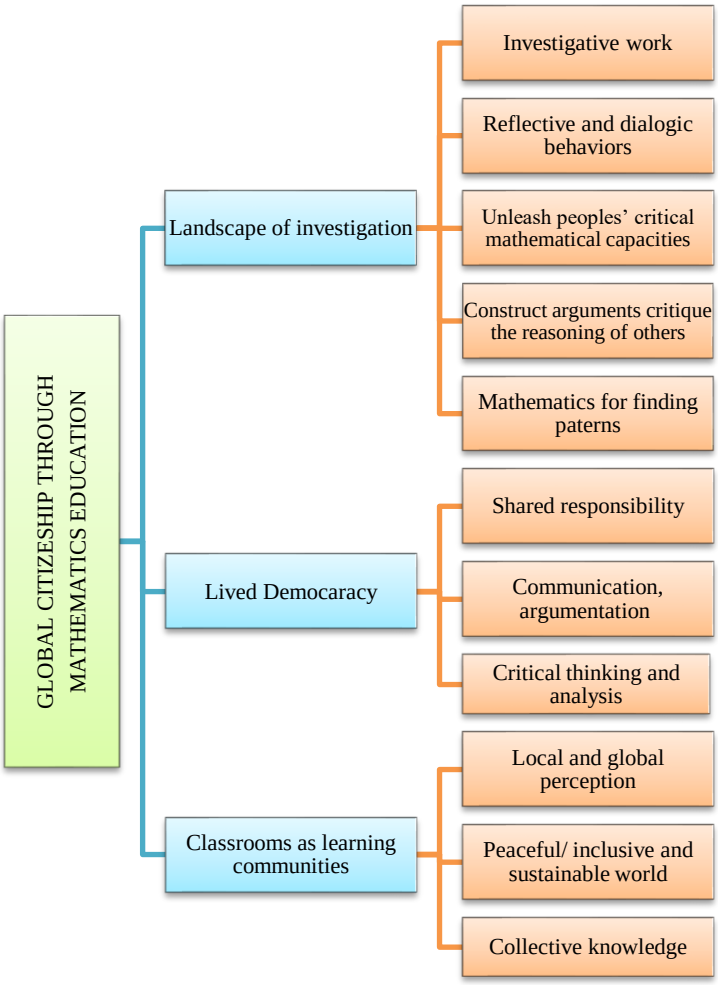
> *Miguel:* Both students of African origin, as well as students of Muslim or Asian origin, curiosity is greater. I didn't understand the issue of xenophobia with them or any kind of aggression, whether physical, speech or exclusion. I see that there is more the matter of curiosity to understand what their life was like in that country, what the schools were like in their countries of origin, what the teachers were like. There's a lot of curiosity. I think what they see on television, this issue of terrorism, the issues of extremists, they end up asking a few things about it.

According to Skovsmose (2022), the exploration of landscapes of investigation is not restricted to specific groups of students. Any group of students can be invited into such landscapes, and from the perspective of critical mathematics education, it is crucial to do so. Considering a classroom as a learning community for a co-responsible learning process for all students to participate in the tasks.

Global citizenship through mathematics education is established through *landscape of investigation, lived democracy* and *classrooms as learning community*. The figure illustrates the main characteristics considered:

[114] See more about stigma and racism in math classes with immigrant students in Chapter 7.

Figure 32: Global citizenship through mathematics education



Source: Produced by the author

Furthermore, landscape of investigation for global citizenship may provide resources for critical activities and take the form of collective investigation processes to work with political and social issues. It may foster learning environments based on listening to others, justice, tolerance, and respect for differences. Immigrants and non-immigrant students can learn to live together democratically in terms of learning through democracy in classrooms, with interactions characterised by democratic virtues. We thus prepare children to live enjoyable lives with others while also recognising and embracing responsibility for the people around them.

The landscape of investigation enriched by lived democracy may contribute to a more comprehensive and nuanced understanding of mathematics education, and highlights the importance of collaboration, diversity, and multiple perspectives in promoting effective and

meaningful mathematics education. In the next section, I illustrate the landscape of investigation *Global Mobility* as a project for mathematics education towards global citizenship.

8.4 Global Mobility

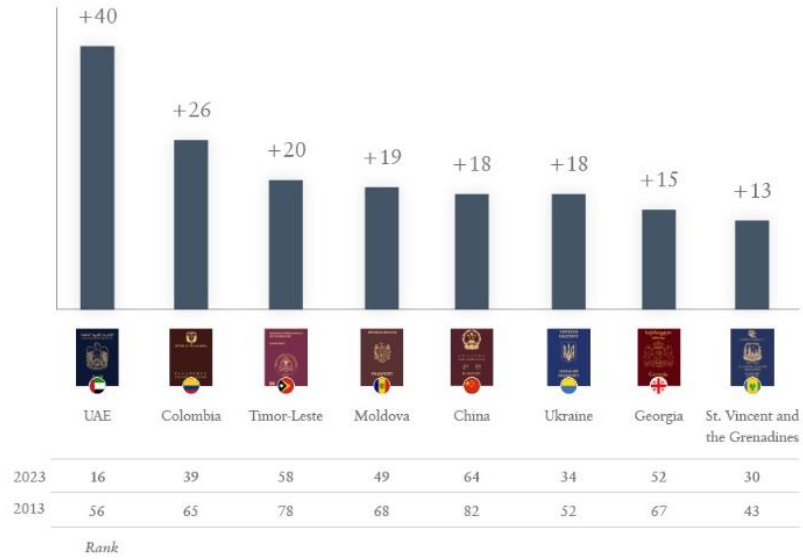
Through pedagogical imagination and a critical perspective, it is possible to imagine possibilities for mathematics classes in a creative and thoughtful exercise. I propose the landscape of investigation *Global Mobility* as an educational possibility that can be pursued through a project to connect immigrant and non-immigrant students through research on international mobility issues as part of a GCE-inspired mathematics class.

According to Morin (2020), the planet is getting smaller. This statement has to do with how our perception of time and space has changed as a result of population mobility across the globe. Five centuries ago, the first single voyage of global circumnavigation, that is known, was that of the Magellan–Elcano expedition between 1519 and 1522, a three-year journey around the world. Today, with domestic flights, one can take less than 48 hours for an around-the-world journey and around three years to visit 195 countries in the world[115]. Technological changes and the development of the virtual world have further reduced distances.

Based on their nationalities, people enjoy very different possibilities of moving throughout the planet. According to Henley and Partners (2021) and the Henley Passport Index, one with an Austrian or Denmark passport, for example, can travel to 188 countries without having to request a visa in advance. Those with a Brazilian passport can visit 170 countries, while a Haitian or Syrian can only visit 48 and 29, respectively. Figures 33 and 34 below show which countries have increased the number of visa-free access countries the most and which have had their list reduced the most in last ten years.

[115] In 2017, the American Lexie Alford is part of the Guinness Book of Records for being the youngest person to travel to all sovereign countries (overall) and (female) in two years. See more in https://www.guinnessworldrecords.com/news/2019/11/around-the-world-by-the-age-of-21-the-woman-who-has-visited-all-195-countries-in-600551

Figure 33: Increase in number of visa-free access since 2013.



Source: Henley and Partners (2021)

Figure 34: Decrease in number of visa-free access since 2013

Source: Henley and Partners (2021)

In *Global Mobility*, there are diverse opportunities for real-life learning in mathematics, enabling students to learn, think, and take action on global issues. Students are invited to investigate the visa status of several countries. The students can collect a range of data from a variety of sources. They compare large numbers, fractions, decimals, and percentages by exploring real-life data such as average incomes, for instance. They make probability statements about world trip possibilities. They engage in tasks that compare area and proportion in different world map projections with demographic data that reflects the racial diversity of different communities or countries, and discuss the implications of these numbers.

The students explore using tables, bar charts, infographics, line graphs, and pie charts to organise the data. They examine the change over time of statistics on global mobility: what were travel permits like over time? (Figures 33 and 34) They investigate different ways in which some data can have been manipulated, the reasons for this, and the consequences this might have, and feel confident in challenging false claims. Students advance their mathematical understanding by analysing such data and looking into its validity and context.

When preparing this landscape of investigation, you need to consider the level of knowledge of the students and the teaching objectives for the class. Thus, different lesson plans can be prepared based on the landscape of investigation *Global Mobility*. Higher-level students, for instance, can explore the complexity of measuring the country's Gross Domestic Product (GDP) [116] and discover how the status of a passport lies on a global GDP spectrum. Students analyse and compare the development indicators of different countries and compare with the survey on visa-free access of the countries. Questions like 'How can passports be related to financial affairs and a conduit to economic opportunity and well-being?' or 'How passport strength can transform a country's fate – and vice versa?' or 'How does visa-free access of the countries represent structural racism?' can emerge.

Immigrant and non-immigrant students can bring together insights concerning disparities and global mobility, discuss racial disparities, and identify patterns and possible causes. They can reach ideas that one group of students in isolation could not have established. New learning potentials and insights are created through collaboration.

Throughout this landscape of investigation, the teacher might be in a risk zone[117]. This is an environment of uncertainty and unpredictability, with the emergence of unexpected situations. In this sense, when students are exploring Global Mobility, the teacher cannot predict what issues will arise, creating a risk zone.

Uncertainties also manifested in the students. Some students would oppose the activity, claiming that they did not perceive a relationship between the activity and mathematics. "Teacher, when will mathematics appear?" or: "This class is different, what does the teacher want?". This resistance would be due to school mathematics tradition. Or the students could be a little uncomfortable discussing such a subject as they would have to move from a passive to an active position. However, a risk zone of uncertainties is also a territory of possibilities.

[116] GDP is the value of the finished domestic goods and services produced within a nation's borders.
[117] For a discussion of the notion of risk zone, see Penteado (2001).

8.5 Last comments

This paper proposed conceptual investigations to address mathematics education for citizenship in terms of education for global citizenship. Conceptions of mathematics education for global citizenship must consider its contested nature, as well as socio-political differences and power relations.

Global citizenship through mathematics education orients spaces in mathematics classes for the construction of a sense of human community that goes beyond a local understanding towards a global one. Awareness of belonging to the global community, as a formative principle, favours the development of a critical awareness and an expanded, self-reflective awareness, capable of perceiving other levels of reality.

Recognising time, peoples, and places as entangled in relations of connection, which accounts for multiple incomplete knowledges, subjectivities, and actors at multiple levels, is essential when reflecting on contexts of mathematics classes that intend to face the underestimation and lack of recognition of immigrant students.

Global Mobility is a possible landscape of investigation for mathematics classes which act as learning communities based on lived democracy. This project could construct tolerance as an expression of shared concerns and coexistence, and challenge any form of *We-Other* dichotomy so that students recognise the other's right not to be treated as an enemy or inferior, which goes toward solidarity of problems in a sense of mutual belonging that unites.

This points towards the insight that mathematics education for citizenship might be developed by involving students in dialogic processes. Through critical dialogue about a moment in society, this makes it possible for the students to see their own conditions and envision a different destiny, through making them interested in and able to engage in problems different from their own.

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9 MICROEXCLUSION AND IMMIGRANT STUDENTS

Manuella Carrijo

ABSTRACT:

Thinking about what inclusion and inclusive mathematics education with immigrant students could mean goes toward glimpsing the roots of what can obstruct such a process, which means taking the path towards unwrapping the processes of exclusion and violence against the immigrant population. Immigrants' and teachers' voices will be heard in this article to support discussions about the issues around inclusive mathematics education. I present situations that illustrate that the inclusive context may be accompanied by microexclusions in subtle practices. Microexclusions tend to isolate people in a given environment, even in that environment considered inclusive. This paper aims, in particular, to discuss a crucial situation: the barriers to including immigrant students have to do with various levels of oppressive social structures. I identify four types of microexclusion related to immigrants having to do with exoticisation, misleading identification, second-class citizen treatment, assimilation, and misprise.

KEYWORDS: Immigrant Students, Inclusive Mathematics Education, Normalisation, Orientalism.

RESUMO:

Pensar o que pode significar a inclusão e a educação matemática inclusiva com estudantes imigrantes vai no sentido de vislumbrar as raízes do que pode obstruir tal processo, o que significa trilhar o caminho para desvendar os processos de exclusão e violência contra a população imigrante. As vozes dos imigrantes e dos professores serão ouvidas neste artigo para apoiar as discussões sobre as questões em torno da educação matemática inclusiva. Apresento situações que ilustram como o contexto inclusivo pode vir acompanhado de microexclusões em práticas sutis. As microexclusões tendem a isolar as pessoas em um determinado ambiente, mesmo naquele ambiente considerado inclusivo. Este artigo visa, em particular, discutir uma situação crucial: as barreiras à inclusão de estudantes imigrantes têm a ver com vários níveis de estruturas sociais opressoras. Identifico quatro tipos de microexclusão relacionados aos imigrantes relacionados à exotização, identificação enganosa, tratamento do cidadão de segunda classe, assimilação e desprestígio.

PALAVRAS-CHAVE: Estudantes Imigrantes, Educação Matemática Inclusiva, Normalização, Orientalismo.

9.1 Introduction

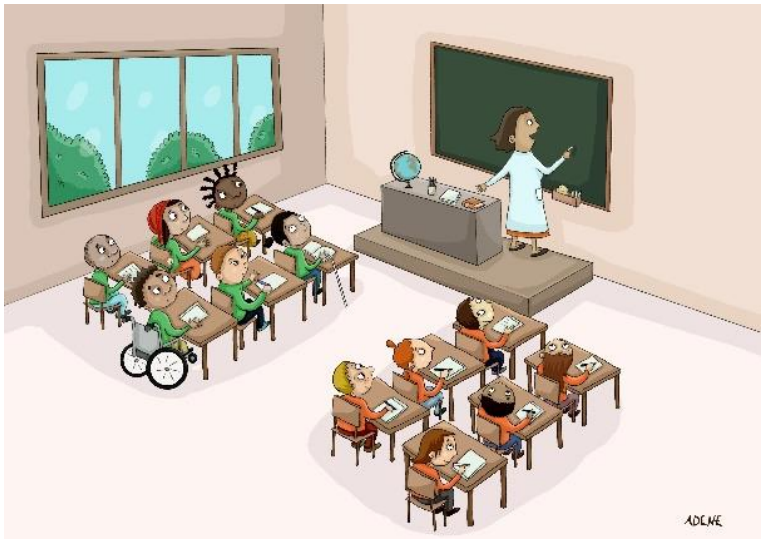
The United Nations (UN)[118] 2030 Agenda for Sustainable Development addresses interconnected goals and targets with a strong focus on the inclusion of vulnerable groups, including people with disabilities, indigenous peoples, and children in vulnerable situations. The UN High Commissioner for Refugees (UNHCR)[119] points to the need to promote inclusive learning environments that include immigrant students.

[118] See more in: https://brasil.un.org/pt-br/sdgs
[119] See more in: https://www.unhcr.org/what-to-expect-working-for-unhcr.html?query=inclusion

The diversities intensified by the international immigration context lead to investigation and reflection on the challenges and possibilities of inclusion for immigrant students. Educational systems in Brazil, as well as around the world, are rethinking their policies and structures to incorporate their growing understanding of the dichotomy of inclusion and exclusion (Soares, 2015; Kollosche et al., 2019)

Inclusion is a contested notion. It can be accompanied by problematic discourses and various approaches and interpretations (Figueiras; Heal; Skovsmose, 2016). Exclusion processes continue to exist even when students are "included" in the educational system (Moura, 2020). "Being inside" may be different from "being part of". Students often share the school space, but experience isolation and exclusion (Barros, 2017), as represented by Figure 35, where students do not necessarily belong to the whole group; they are not joined or connected.

Figure 35: "Being inside" is different from "being part of"



Source:https://world-education-blog.org/2020/07/08/all-teachers-should-be-prepared-to-teach-all-students/

Discussing inclusive mathematics education with immigrant students leads to discussions about the implications of language on the development of mathematical cognition (Barwell et al., 2016). However, I also find it crucial to discuss such inclusion in terms of the socio-political conditions of power relations. This means turning attention to systems that generate the exclusion and violence which immigrant student populations may be subjected to (Baber, 2012; Valoyes-Chávez; Montecino; Guzmánc, 2021).

Systems of oppression are established throughout intersections with other forms of oppression; that is, the oppression experienced by immigrants is linked to race, age, social class,

language, and gender, all of which generates and maintains social hierarchies (Tummala-Narra, 2020). Exclusion, discrimination, and marginalisation may have roots deeply below the ground of a system of oppression. The root of exploitation lies outside of education, in a system of economic power and privilege in which racial distinctions play an essential role (Kalwant; Preston, 2012). Furthermore, education may also be a means to maintain economic power and privileges.

Mathematics education may be related to social exclusion, in which people can be systematically pushed to the edges of society (Skovsmose, 2005; 2023). Exclusive mathematics education, environments, and practices reflect a socially racialised system[120] (Martin, 2013). Mathematics learning and participation can be characterised as racialised forms of experience. Black students, immigrants, and other groups of marginalised students have experienced constant acts of violence and exclusion inserted into racist practices of school mathematics (Martin; Price; Moore, 2019; Valoyes-Chavez; Andrade-Molina, 2022). Immigrants and their families are vulnerable to exclusion and aggression inside and outside the school, which can act as a barrier to them learning mathematics.

In Brazil, immigrant students with specific phenotypes and cultural characteristics tend to be accepted more quickly, while other immigrant groups encounter more difficulties, even when Portuguese is their mother tongue (Oliveira, 2019). Indeed, speaking the local language is essential in the learning process, but it does not guarantee that immigrant students are considered equally in mathematics classes around the world (Baber, 2007). Brazil is known for being welcoming to immigrants (Carneiro, 2018 a). In this sort of context, which is seen as inclusive, it is still critical to identify and address exclusion and aggression, and reflect on how such violence may impact immigrant students' sense of belonging. Such concerns apply to every educational context, including mathematics education.

Although every student is potentially subject to systemic exclusion and aggression in the school environment (Padilha; Oliveira, 2013), the consequences for many immigrant children are specific due to their dislocated conditions. Immigrant people may deal with several borders during the immigration process. Exclusion and aggression are just one such social border, and they are representative of the *We-Other dichotomy*[121]. Exclusion and aggression may shape immigrants' lives by making them feel "unwanted" and lack a sense of belonging, increasing their social disadvantage and sense of injustice.

[120] See more about a socially racialised system in Chapter 2 and Bonilla-Silva (1997; 2015).
[121] See more about We-Other dichotomy in Chapter 4.

Such a situation needs theorisation to enhance counter-hegemonic processes in the onslaught of the struggle for effective inclusive education. This chapter aims to bring theoretical concepts to the surface, to explore the covert layer of exclusion and discuss what is behind the discrimination that immigrant students often face. Thinking about what inclusion and inclusive mathematics education with immigrant students could mean goes toward glimpsing the roots of what can obstruct such a process, which means taking the path towards unwrapping the processes of exclusion and violence against the immigrant population. This also means going beyond looking at mathematics classes and reflecting on social issues.

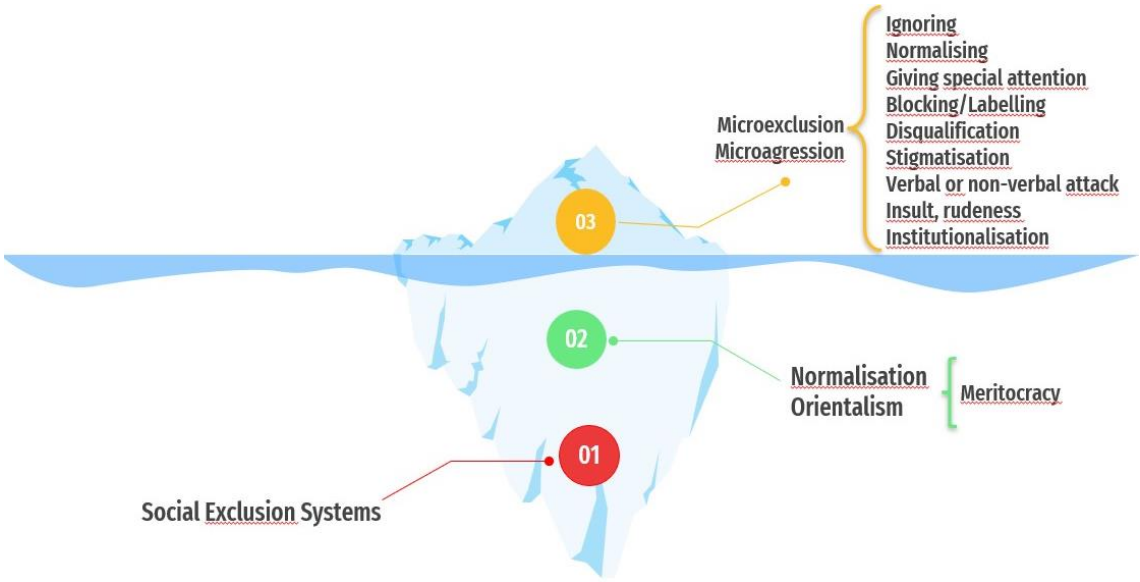
In the next section, I present what I call the *inclusion/exclusion iceberg* and organise critical concepts such as *normalisation, orientalism, microexclusion*, and *microaggression*, which are discussed in the following section in reference to their impact on immigrant mathematics education. Then, focusing on microexclusion, I present a range of cases of the situation in the Brazilian reality inside and outside mathematics classes, through the voice of mathematics teachers and immigrants[122]. Finally, I concentrate on key concepts for inclusive mathematics education with consideration of immigrant students.

9.2 Inclusion/Exclusion iceberg

I propose the *inclusion/exclusion iceberg* (Figure 36) as a metaphor to discuss concepts related to the duality of inclusion and exclusion, going beyond the surface of manifestations and evident effects. Positioned in a conceptual organisation, some concepts are represented in covert layers of the system and discourses, and others in the overt layer of actions. Such concepts will be discussed in the following subsections.

[122] This paper is theoretically driven by doctoral research data. The corresponding doctoral research involved fifteen participants who live in Brazil: immigrants and parents of immigrant students from Haiti and Venezuela and mathematics teachers in schools with immigrant students in São Paulo (Brazil). The research aims to consider socially and racially structured exclusions, to discuss perspectives and approaches, and to challenge mathematics education with immigrant students towards inclusive actions.

Figure 36: Inclusion/exclusion iceberg



Source: Produced by the author

In Figure 36, the image of an iceberg is used to illustrate the structural constitution of the inclusion and exclusion relations that present covert and overt layers (i.e., that have visible and invisible aspects). The figure of an iceberg exemplifies that those apparent manifestations (Layer 03), taken as individual attitudes and behaviours of exclusion and aggression, are just small parts of a larger and more complex structural contingent.

I see the many mechanisms that produce exclusion and social injustice as being centred on a structural base (Layer 01), through which permeate the social difference markers (such as those related to racism, gender, age, and differences in physical and intellectual abilities). In this sense, Layer 01 is one of the cores ideologies that underlie *normalisation* and *orientalism* discourses (Layer 02), which may establish models and paradigms. Therefore, normalisation and orientalism may justify the meritocracy, for instance, and make the operationalisation of apparent manifestations of exclusionary violence represented in *microexclusions* and *microaggressions* (Layer 03) possible in all different ways and themes.

The conceptual tangle, represented by the *inclusion/exclusion iceberg*, brings a general representation of concepts that help to reflect on how the mechanisms inherent to social inclusion and exclusion could be. Indeed, other layers and concepts could be considered relevant to this illustration. For the following subsections, I focus on discussions around such concepts in an exercise on critical reflection on a structural whole.

9.2.1 Normalisation and Orientalism

For Fromm (1970), the pathology of normality is an alienated existential of the contemporary capitalist societies, where they are portrayed as a rational and mentally healthy standard. According to Fromm, society refers to "deviant" or "inadequate" people as a diverging from the perspective of normality, determined in terms of lack of alignment with a dominant collective lifestyle.

According to Marcone (2015), concepts of normality are contextual; they are socio-politically and historically defined and establish what is meant by disability. According to the author, people do not have a disability *a priori*; instead, they are considered disabled within and through the context in which they are inserted. Thus, the dichotomies *normal/abnormal*, *normal/disabled*, *normality/abnormality*, among others, are terms that permeate social definitions.

Fromm and Marcone point to normality as a concept constructed by people. Those who consider themselves "adjusted" to the environment, "normal", create criteria for what can be considered normal or abnormal. What is considered normal today may not have been normal in the past. One can consider societies, both in the past and currently, in which women wearing pants can be perceived as abnormal and abhorrent behaviour, for example.

Accordingly, another social concept is orientalism. According to Said (2007), the Orient is merely imaginative. The author points to Orientalism as a Western attempt to dominate, restructure, and have authority over the Orient. Orientalism depends on a position of superiority that places the West in a whole series of possible relations with the East without ever taking away its dominance. For the author, the orientalist perspective is intrinsically linked with a colonialist vision, where the Orientals are seen as "barbaric" or "uncivilised", and it is necessary that the West brings them social advancement, which only comes from the colonial domination of its territories and loss of autonomy of its population. Orientalism justifies dominance over other peoples.

Discussion on the concept of normality can broaden the perspectives of inclusive education (Marcone; Penteado, 2019), as well as on orientalism, which may broaden the understanding of inclusion and its contested nature. A perspective of inclusion based on normality goes towards researching, understanding, and healing "abnormal" people. This means seeking to "help the less fortunate" under the rule of disability (Lima, 2022). Even if, sometimes, visibility is given to the "abnormal", this process occurs hierarchically. Similarly, a perspective of inclusion based on orientalism follows precepts of colonial domination in the sense of curing the uncivilised and bringing them social advances. The concept of normality

and orientalism are deep under the scene (Layer 02 in Figure 36), supporting exclusion discussions and actions.

Definitions of normality and orientalism permeate, among other things, racism, class prejudice, gender prejudice in narratives and discourses of oppression and domination of people (Marcone, 2019). I see such features as intersecting with the context of immigrant people and their different ways of being in the world. Such differences can be confined within the perspectives of normality and orientalism. Talking about normal and abnormal in relation to groups of immigrants might mean referring to differences in phenotypes, religions, customs, behaviours, or ways of communicating, for instance. Thus, the terms normality and orientalism may permeate an ideology based on nationalism and racism as social markers of difference.

Bishop and Kalogeropoulos (2015) refer to growing diversity—also represented by students with different backgrounds, languages, religions, social statuses, contexts of poverty and trauma, etc—as profoundly impacting educational systems. The local context can affect the learning of these students in several ways. For the authors, immigrant students need to adjust to a new set of values that are sometimes conflicting, which can affect performance in mathematics classes. Civil (2012) refers to surveys in several countries that criticise educational policies pushing immigrant students to assimilate. These policies convey a view of deficits in immigrants' language and culture rather than promoting diversity as a resource for learning.

Nevertheless, immigrant students are likely to be considered abnormal in mathematics classes. They may differ from a standard of normality in the face of the expectations of a dominant group: this includes variations in language, clothing, physical and cultural differences, and religion, for example. These non-standard characteristics may make non-immigrant students uncomfortable and create exclusionary gaps, separating what is accepted and embraced from what must be ignored and submitted.

Therefore, I see that for such students, the “disability diagnostic report” has to do with being an immigrant. In other words, being an immigrant represents a salient point of differentiation—the “deformity”, the “disability” that places them outside a possible standard of normality expected for a student—outside the ideal of normality existing in the more extraordinary collective imagination.

Such a “report” is obviously inserted in a range of intensity degrees. One can consider different groups of immigrant students with different degrees of “being out of normality”; they can be at different levels of distance from what is considered the social standard where they live. As a reflection of a socially racialised system, certain groups of immigrants may have characteristics considered normal for the context of the destination country. However, other

groups present differences that appear strange, causing fear and aversion. This expands into a range of possibilities since such differences are present both between groups and between people from the same group of immigrants.

In this path, the ideal of what is expected of a mathematics student in the face of a pattern of normality and orientalism can create exclusionary environments and impose ways of thinking and assimilation of immigrants. This has to do with a colonising perspective in which the coloniser, in a position of superiority, teaches the other person how to be civilised. This directly impacts the teaching and learning of mathematics for immigrant students. Such students, "included" in school systems in the host country (such as in Brazil) may suffer microexclusions and microaggressions in their various forms of manifestation.

9.2.2 Microexclusion and microaggression

Martin (2021) highlights how inclusion and exclusion interact at different levels in society. For example, reform efforts at the *macro* level (e.g., education policies) can interfere at the *meso* level (e.g., educational systems and schools) and *micro* level (e.g., classroom and individual levels). I focus on specific forms of exclusion at the micro level, but without losing sight of the racialised social system, which means that such actions are not the result of individual behaviour but the result of systematic factors.

Microexclusions are forms of violence operating at a micro level, thus focusing on an individual and/or local level. They are practices of subtle and veiled violence and, in many cases, ordinary and non-physical, which can occur in "inclusive" spaces. They occur consciously (or not) and tend to isolate and oppress people. These are instances of aggression that occur through stigmatising speeches, hostile attitudes, subtle practices and, often, covered up and not easily identified (Faustino et al., 2018; 2019). Microexclusions can be split into eight different types: ignoring, normalising, paying special attention to, barring, labelling, disqualification, stigmatising, and institutionalising (Faustino et al., 2018; 2019). I see microexclusion as apparent manifestations (Layer 03 in Figure 26).

Reflecting on microexclusions lead to reflection on the concept of microaggressions. *Microaggressions* are interpersonal verbal and non-verbal exchanges, in which the aggressor causes harm to a target, intentionally or unintentionally; they are a form of systemic violence used for marginalisation. Microaggressions can be racial and align with explicit racial derogation, through a verbal or non-verbal attack. Action which makes people feel unwanted and insecure for being considered inferior or subhuman represents subtle contempt and hidden

insults, and is characterised by interpersonal exchanges that convey stereotypes, rudeness that demeans a person's racial identity (Sue; Spanierman, 2020).

Microexclusion and microaggression are manifestations of structural violence rooted in the structures of society and which are reflected in the most different contexts, whether educational or not (Silva; Skovsmose, 2019). They “often go unnoticed and unacknowledged because they seem so familiar in everyday settings, such as classrooms, shopping malls, restaurants, hotels, and offices” (Sue; Spanierman, 2020, p. 28).

Structural racism is a source of microexclusions and microaggressions, which helps to continue racial oppression in ways that are often invisible (implicit bias) (Solórzano; Huber, 2020). The precepts of microexclusion and microaggression are fundamental for the institutionalisation of exclusions, downplaying inequalities and justifying the exclusionary actions and competitive individuality of the meritocracy that assert that racism plays a minor role.

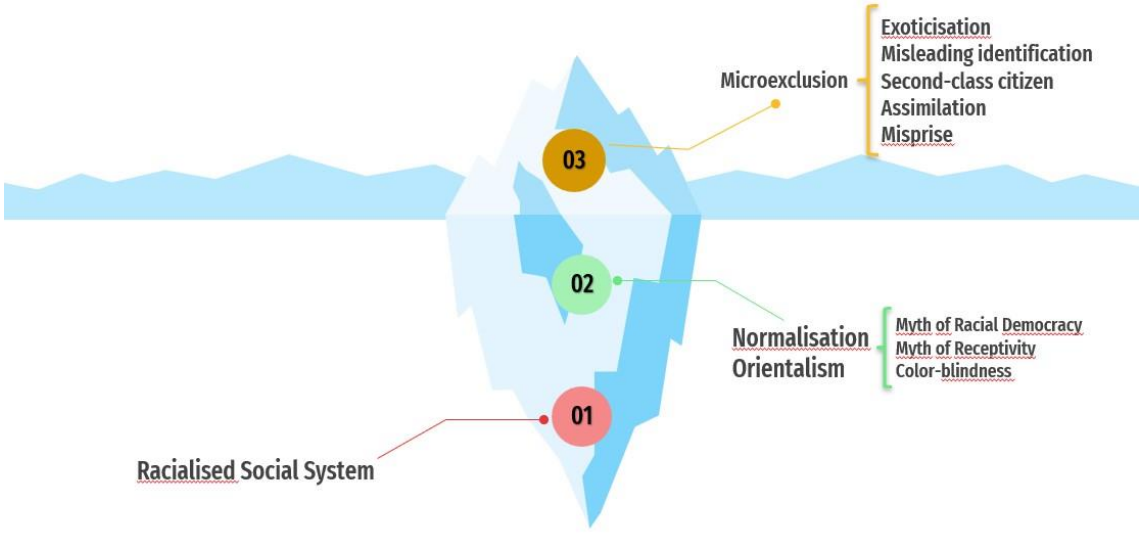
In mathematics classes, microexclusion and microaggression are still underestimated problems, despite negatively affecting processes related to teaching and learning mathematics (Silva; et al., 2023). These phenomena can interfere with students' motives to learn mathematics (Silva; Powell, 2016; Faustino et al., 2019). “Microexclusions deprive the individual of equal participation in contexts of social life, including with regard to learning. In addition, micro-exclusions contribute to highlight, even more, the differences between students” (Faustino et al., 2018, p. 910).

Accordingly, microexclusions and microaggressions impact immigrant students’ lives inside and outside schools. Furthermore, such violences may gradually push them toward the margins of groups through covert actions that communicate (implicitly or explicitly) that they do not belong to those spaces.

9.3 Immigrant inclusion/exclusion iceberg

Reflecting on a conceptual framework in terms of the immigrant people’s contexts, I propose the *immigrant inclusion/exclusion iceberg* (Figure 37) as an organisation that considers specific concepts with regard to immigrants.

Figure 37: Immigrant inclusion/exclusion iceberg



Source: Produced by the author

The *immigrant inclusion/exclusion iceberg* is based on a socially racialised system (Layer 01) as a core structured system of oppression ideologies. Through normalisation and orientalism (Layer 02) paradigms, the myth of racial democracy and receptivity of immigrants[123], as well as not seeing colour or race (colour-blindness), is sustained, especially considering Brazilian reality, and similar contexts where microexclusion might lead to xenophobia and be engendered by a nationalist ideology. Subsequently, microexclusion and racial microaggression (Layer 03) are operationalised in a range of actions.

Mathematics classes with immigrant students need to be analysed regarding inclusion and exclusion and the roots of social borders[124] they may face. I address special attention to reflections on what may be related to the veiled and sometimes silent actions of *microexclusion against immigrants* and on how the understanding of what is normal and abnormal is used to define them as targets of different modes of microexclusion.

As previously mentioned, Faustino et al (2018; 2019) highlights that microexclusion can happen in several different ways. Inspired by these different types of microexclusion and paying closer attention to situations in which microexclusion can happen with immigrants in Brazil, I identify four types of microexclusion related to immigrants, to do with *exoticisation, misleading identification, second-class citizen treatment, assimilation,* and *misprise* (Layer 3, Figure 37).

[123] See more about racial democracy in Chapter 2.
[124] See more about social borders in Chapter 3.

9.4 Instances of microexclusion

In this section, I present examples of the microexclusion phenomenon through the immigrants' and mathematics teachers' accounts[125] of their lived experiences in Brazil as elements of the social and educational framework. I present some excerpts from interviews that can give an impression of what is taking place in Brazilian schools with immigrant students. The voices of the Venezuelan immigrant Frida and the Haitian immigrants Leo, Max, and Toni, as well as the mathematics teachers Miguel and Markus, will be heard in this paper to support discussions about immigrant students on the issues of inclusive mathematics education. The immigrant reports offer narratives that speak of various forms of microexclusion.

9.4.1 *Instance 1* Exoticisation: Celebrating the eccentric?

Frida relates how her daughter felt about the treatment of other students at the school in Brazil.

> *Frida:* I remember that my daughter, in her first year here (in Brazil), said: "Thank God that the school year is over. I couldn't stand everyone asking why I spoke differently." She also couldn't play because she couldn't understand people.

It seems that the Venezuelan student felt awkward and inadequate. The differences she has, being an immigrant, seem to label her as unusual, eccentric, and outside what is considered normal in that context. She was also unable to feel included in playtime and felt *ignored* and *unwelcomed* by her peers. In this case, although the student is included in the school environment, she is constantly reminded that she is "out of place", that she is different, and that she is (supposedly) inferior.

Teacher Markus reports on an initiative at the school where he works which involves moments of celebration to bring students together:

> *Markus:* We have many projects focused on integration, because the culture is different. We have several festivities. We have several themed parties. Every year we have a party called Brazil/Haiti. And at this party, we do all the decorations. Students parade and bring typical music. We have a mix of cultures, which is very interesting.

This project seems to give a stage to immigrant students with the intention of inclusion. Teacher Markus describes a school initiative that involves celebratory moments to bring students together and celebrate differences in musical styles, dances, and outfits.

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[125] The speeches were translated from Portuguese into English, and participants' names are fictional to ensure their anonymity.

It seems to be a relevant project. However, with action like this, it is important to avoid placing immigrants in the role of "exotic" in a sense of "folklorisation"[126]—the stage is offered to immigrant students as a mode of inclusion, but behind the scenes they remain in a marginalised or outdated place of consideration. Exoticisation can be summed up as marginalisation.

Furthermore, the characteristics of immigrant students can be presented instead of *stigmatisation* through *labours* in a range of tones that go from the obsolete to the civilised irregular. More specifically, micro-exclusion may take place in the subtle format of exoticisation in the face of differences that may be considered eccentric or abnormal.

9.4.2 *Instance 2* Misleading identification: A label for the unimportant?

Miguel reports a situation he experienced in mathematics classes and talks about non-immigrant students making jokes with immigrant students from South America.

> *Miguel:* We have 46 different nationalities at the school. More than half of the students are from South America, mostly Bolivians. But we have a considerable group of Argentineans, Paraguayans, Colombians, Venezuelans and Chileans. I realise that Brazilian students make jokes, and they end up calling everyone who speaks Spanish Bolivian. It may happen that some students get offended. There was a situation where the student was Colombian. I didn't know. He was called a Bolivian and felt offended. He said "I am not Bolivian. I'm Colombian. Don't call me that."

In this report, Colombian immigrant students demonstrate that they feel offended at what seems to be deliberately intentional non-recognition by other students. By using a *label*, calling any immigrant student from South American countries Bolivian, non-immigrant students act hostile and place immigrants in the same group: "the foreigners". This lack of correct identification seems to generate in this student a sense of lack of importance and lack of involvement with the group.

Furthermore, the teacher seems to witness the situation only as an observer. Also, he seems to minimise the situation by reporting it as a one-off fact: "Some students might get offended". He didn't have much information about this student: "There was a situation where the student was Colombian. I didn't know. He was called a Bolivian and felt offended".

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[126] I see folklorisation as the opposite pole of folklorism, opposed to a performative practice composed of extracted fragments that include ideas, attitudes and values that exalt cultures, manifestations in the sense of representing a tradition of a locality, region or nation (McDowell, 2010).

It seems that certain people appear to be a catch-all term for people in a microexclusion related to *misleading identification.* It seems that those you don't know very well or don't appreciate much of can all be put in the same group: “the strangers”. Such discrimination can be linked to racism and xenophobia since it systematically places a particular group of people in a place of unimportance.

How can one explain the apparent distinctions given to people from different countries in Europe or between people from different states in the USA while ignoring the distinctions between people from different countries in South America or Africa, for instance? Indeed, the possibilities of recognising differences between Italian and Portuguese people will be greater than the chances of recognising differences between Colombian and Bolivian people, as in the situation outlined by Miguel.

9.4.3 *Instance 3* Assimilation: Camouflage or disappear?

Frida reports on the experiences of her immigrant son in a Brazilian school:

> *Frida:* When I enrolled my youngest son, the teacher didn't want to understand that he was young. It was the first time he went to school. That he couldn't speak Portuguese properly. And she said: “But avoid speaking Spanish at home”. And I said: “But I can't stop speaking Spanish. And I know that in Brazil’s curriculum there are Spanish classes.” So, it was a question that was rejected, about our communication.

This report evidences the imposition of the school context by indicating that the immigrant student was asked to deny his mode of communication within his own family life. In this case, microexclusion happens through *institutionalisation* and *normalisation*. The student finds himself in an impasse of abandoning his differences and adapting to the normality that the school requires. This is an explicit exclusion and a painful attack on immigrants’ sense of self and those with whom they identify most.

Understanding the language of the local country is certainly important for those at school. However, the specificity of the student seems to be understood as such an obstruction that the way out found by the teacher is embedded in the family subjectivity of the immigrant child. This report is in line with the reflections of Marcone (2015) when he says that:

> someone who does not believe that difference will one day be accepted, that only when some kind of transformation occurs, where the disabled person will

> hide the horror of their deformity and manage to become invisible and no longer obstruct the path of normality, only then will they be tolerated (p.53-54)[127].

Furthermore, immigrant students may find themselves needing to camouflage in order to be accepted. Microexclusion takes place between the lines of *assimilation* actions. Students may not need to deny their diversity, but they may be silenced about their cultural identity and other manifestations of differences. Paraphrasing Marcone (2015), this translates into the normalisation and orientalism impositions such as: “stay white or disappear”, “see or disappear”, “listen or disappear”, “speak Portuguese or disappear”, “dress like the locals or disappear”, “be normal, or disappear”.

9.4.4 *Instance 4* Second-class citizens

Leo reports the lack of welcome his son experienced at school in Brazil:

> *Leo:* Before, I had the problem of my children not understanding what they were saying. But now they understand. He still has a lot of trouble reading and writing. But that's not what makes it difficult for him to keep up with the other students, because there are students who have a lower level than him. But the problem is not that he is not Brazilian. The issue is lack of care.

Leo points out that it is not his son's language differences that are the main border to his inclusion in school. He points to “lack of care” as the biggest issue to consider. I understand he is referring to actions that relate to exclusion. In a way, this is related to microexclusion, where the son is made to feel uncomfortable and unwelcome.

Teacher Miguel reports on the different ways that immigrant students are accepted at the school where he works.

> *Miguel:* Acceptance is not the same. What I perceive is that there are some differences: for example, if the student is of Bolivian origin, acceptance is different if he is Angolan or Nigerian or if he is Muslim. Acceptances are different in different contexts. Because many come because of the activity that the family carries out here (in Brazil).

Also, Markus reports a situation that happened during a conversation between teacher and students in one of his mathematics classes:

> *Markus:* In the small lines we realise that there is (prejudice). There was a girl who said that she needs to find a new boyfriend, because she had just divorced from her ex-husband. I suggested that the school had many boys. She replied that Haitians she didn't want any: “Ah! God forbid I date a Haitian!” One of them

[127] Translated from: Alguém que não acredita que a diferença será um dia aceita, que apenas quando ocorrer algum tipo de transformação, onde a pessoa com deficiência esconderá o horror de sua deformidade e conseguirá se tornar invisível e não mais obstruir o caminho da normalidade, somente assim serão tolerados (Marcone, 2015, p.53-54).

> (Haitian student) asked: “Why don't you want Haitian?”. And she was embarrassed and didn't answer. We know it is related to xenophobia and racism. Oh! If it was an American, a German or a Japanese it would be totally different. There's the issue of skin colour, right? And then there's the issue of stereotypes.

Markus talks about how these behaviours usually happen in a subtle way, perceived “in the small lines”. Haitian students were treated as an inferior group of people. In attitudes based on racism, they were attacked as a group through discriminatory speeches that reflect avoidant behaviours. The messages made Haitian students feel unwanted and insecure because they are not considered people who do belong to the same levels as others in society.

Max talks about an experience of exclusion:

> *Max:* I have several tests (experiences). I remember that I went to get my documents, I won't mention the name of the place, and people treated Haitians differently from how they treated other foreigners, Japanese, German, American, for example. The way they treated each foreigner was different. It was possible to see the way they received people. I don't have a word in Portuguese to describe it. We know when the person treats with difference.

Max assumes that he has difficulty with the Portuguese language when he says he does not have a word in Portuguese to describe what he experienced. I say that words like microexclusion and microaggression describe what he experienced well. Treating others differently is a subtle behaviour when approaching certain immigrant people as second-class citizens.

Toni reports what she experienced when walking through the streets of a city in Brazil:

> *Toni:* Sometimes it happens that I'm walking down the street and the person crosses to the other side, out of fear. Once I called the girl and asked why she crossed. She apologised and said she was afraid of being robbed. She'd been robbed before and all. But later she apologised. I understand.

Toni reports a situation of microaggression in which a person shows fear when passing him on the street of a city in Brazil. Indeed, the fact that he was a black person was a factor in causing this aggression. This shows harsh treatment based on valuation when assuming that Toni could be dangerous according to his physical characteristics. Aggression does not occur through insults or accusations. However, it happens through subtle behaviour that might go unnoticed.

As an example of microexclusion, we can imagine a situation where classmates are invited to a classmate's birthday party. However, immigrant students are forgotten, possibly due to their inability to communicate in the local language, or perhaps because they bring

“discomfort” with their religious practices that do not match the style of music that will be played during the celebration, for example.

9.4.5 *Instance 5* Misprise: is this person capable?

On the activities developed in mathematics classes, Miguel reports the experience of proposing different activities for an immigrant student:

> *Miguel:* We try to have a different look, although, in general, I apply the same activities that I give to Brazilian students, so as not to cause a difference. I already applied an activity A for the class, and, for that immigrant student, I applied another activity. This immigrant student did not like it and said: “Why do I have to do a different activity? I want to do the same activity”.

In this report, the teacher talks about his concern to offer the same activity to all students. Also, he recalls the experience he had when offering a different activity to an immigrant student who declared dissatisfaction with receiving activities different from those of other students in a mathematics class. Wrapped in an intention of inclusion, the teacher's conduct reveals an attitude of microexclusion that seems to have occurred through misprising. That is, the teacher may have had an unfavourable judgment in advance about the capacities of the student to engage in the activity together with colleagues, either for reasons of understanding the Portuguese language, or for cognitive issues assigning a degree of intelligence, or for other reasons. Perhaps the teacher wanted to offer special attention.

Mila report exclusion at work:

> Mila: I experienced humiliation at work because of religion. Also, a co-worker, afraid that I would take away her job, taught me the job the wrong way. They think that we as immigrants are not aware of our rights. [...] My brother-in-law is a musician. They hired him for music lessons, but when they found out he was an immigrant, they refused him.

When she says: “they think that we as immigrants are not aware of our rights”, she points out the underestimation in the treatment she had. The same seems to have happened to his brother-in-law, who was dismissed from being a guitar teacher because he was an immigrant.

Teacher Lucas also makes a comment in this regard:

> *Lucas:* I developed a chess project at school, which I think has a lot to do with mathematics. The number of foreign students who attended this project was very large. Half of the class was foreigners, which surprised me, even for their performance in mathematics. The South American students liked it a lot, they were more interested. I don't know if it's something cultural or if it's a general commitment to study, but their relationship with mathematics was better.

> Despite the fear of the language issue, it flowed well, they had a good understanding.

From teacher Lucas account it is possible to perceive his under expectation. When he says: “Half of the class was foreigners, which surprised me, even for their performance in mathematics” he highlights the low expectations he had about the production that immigrant students would present in a project that he considers demanding mathematical knowledge.

Even if unintentionally and subtly, the teachers may have approached the student in a disqualifying way. A view under the rule of disability may have led teacher Miguel to make an attempt to help that student in need, due to his possible inability to complete the same activity as his peers, placing him in a place of underestimation and strangeness.

This type of proposal by the teacher, to offer a different activity, could cause another form of microexclusion: blocking. The class’s isolation from the immigrant student would make it impossible to share ideas and discuss possible resolutions of math tasks in class. Moreover, other colleagues may have an underrated and questionable look at the student’s capabilities. Thus, they can be downgraded and put in disrepute or labelled as having little or no learning ability. Consequently, these students may face isolation and obstacles in the mathematics teaching and learning processes.

9.5 Inclusive Mathematics Education

Recapitulating the five types of microexclusion identified against immigrant students, they are *exoticisation, misleading identification, assimilation, second-class citizens, and misprising*, I do not mean to make a classification, and I do not claim that these are the only forms of microexclusion that immigrants have to deal with. Ruther, I illustrated subtle manifestations of exclusion hidden and unquestioned within normalised educational practices. This reminds us that “being inside” may differ from “being part”.

These six types of microexclusion come from a broader structural exclusion system that has their unnoticed roots under difficult-to-identify levels, revealing markings in marginalisation and inferiority. Such microexclusion practices are presented in a gradient of subtlety and dissimulation, conducive to reinvigorating racism and xenophobia.

Understanding the structures of the immigrant inclusion/exclusion iceberg has to do with inclusive mathematics education considering immigrant students. Many immigrant students demand attention in aspects that go beyond multilingual varieties. These are uprooted people who consequently feel inadequate in the face of standards imposed by discourses related

to normalisation and orientalism in movements with shapes and contours inside and outside the school space.

This text presents reports from immigrants and teachers about situations of microexclusion. The data reveals a context of micro-exclusion experienced by immigrants in Brazil and indicate that inclusion takes place in environments that intend to value differences, but under discourses of education in standards of normality, which appears to point to the bottom of the issue.

These accounts are representative of a larger social context. However, they also reflect a context that needs to be considered by inclusive mathematics education discourses that may remain superficial if they do not delve deeper into the roots that generate exclusion in mathematics classes. Underestimating this complexity involves preventing minimisation or superficialisation of such discussion.

It is not easy to deconstruct microaggression in mathematics teaching in any context, as they are embedded in beliefs (Silva et al., 2023). However, more than changing beliefs, overcoming microaggression means challenging structured systems of oppression.

Coping with microexclusion in mathematics classes is just one of the aspects to be reflected and theorised upon when considering the inclusion of immigrant students. Being noticed and recognised in mathematics classes and not being perceived as less important or inferior is essential to inclusion and can increase motivation to learn mathematics. Inclusion means action to make them part of learning environments – with no specific group of students being overlooked. Being pushed away from learning opportunities may place immigrant learners at risk of marginal participation in society.

This paper discusses crucial concepts for thinking about inclusive mathematics education for immigrants. More research is needed to unravel how systems of reason in different racialised systems shape and challenge discourses of inclusion and the materialisation of reform efforts on inclusion in mathematics education I hope this paper encourages discussions that stress inclusive mathematics education, moving towards raising demands and probing possibilities that encompass issues pertinent to the collectivities of immigrant students.

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10 GLOBALISATION AND GHETTOISATION: ABOUT *MEETINGS AMONGST DIFFERENCES* IN MATHEMATICS CLASSES

Manuella Carrijo

ABSTRACT

Globalisation is a contested concept and therefore refers to contradictory social processes. Immigration is one of these processes which is established alongside the dualities of globalisation and ghettoisation. This paper is theoretically driven on doctoral research data, and it aims to present concerns and possibilities of critical mathematics education regarding immigrants in the face of globalisation and ghettoisation challenges in a world impacted by social and racial structured injustices. The following topics will be addressed: (1) Firstly, I set out what I mean when I refer to globalisation and ghettoisation, and discuss how such concepts are related to mathematics education and immigrant students. (2) Following this, I present the participants' reports, highlighting voices of immigrants and mathematics teachers from schools in São Paulo/Brazil. (3) Next, I address a theoretical discussion on "meetings amongst differences" within mathematics classes with immigrant students. (4) Finally, I address, through pedagogical imagination, the hypothetical project "Ghettoisation—Is Racism a Factor?" as a possibility to help us consider the reality of immigrant students and consolidate meeting spaces to overcome the distances created by ghettoisation.

KEYWORDS: Immigrant Students, Meetings Amongst Differences; Critical Mathematics Education; Racism; Pedagogical Imagination.

RESUMO

A globalização é um conceito contestado e, portanto, refere-se a processos sociais contraditórios. A imigração é um desses processos que se estabelecem ao lado das dualidades da globalização e da guetização. Este artigo é fundamentado teoricamente em dados de pesquisa de doutorado e tem como objetivo apresentar preocupações e possibilidades de educação matemática crítica em relação a imigrantes diante dos desafios da globalização e da guetização em um mundo impactado por injustiças sociais e raciais estruturadas. Serão abordados os seguintes tópicos: (1) Em primeiro lugar, exponho o que quero dizer quando me refiro à globalização e à guetização, e discuto como tais conceitos se relacionam com a educação matemática e os estudantes imigrantes. (2) A seguir, apresento os relatos dos participantes, destacando vozes de imigrantes e professores de matemática de escolas de São Paulo/Brasil. (3) A seguir, abordo uma discussão teórica sobre "encontros entre as diferenças" nas aulas de matemática com estudantes imigrantes. (4) Por fim, abordo, por meio da imaginação pedagógica, o hipotético projeto "Ghettoisation—Is Racism a Factor?" como possibilidade de nos ajudar a pensar a realidade dos estudantes imigrantes e consolidar espaços de encontro para superar as distâncias criadas pela guetização

PALAVRAS-CHAVE: Estudantes Imigrantes, Encontros Entre As Diferenças; Educação Matemática Crítica; Racismo; Imaginação Pedagógica.

10.1 Introduction

A period marked by globalisation, rapid increases in communication, large-scale migration, and displacement of populations leads to crucial changes in social patterns. Such changes demand the establishment of educational spaces that foster a posture of tolerance and

provide opportunities for all students to participate in the learning processes. Thus, educational environments must support actions to overcome relationships based on bias against diversity triggered by racism and xenophobia.

Immigration is a worldwide phenomenon that impacts and is influenced by a wide range of circumstances of interaction between people from different cultures. It is regulated by notions of, for instance, citizenship, diversity, social justice, human rights, racism, inclusion, and other topics that stand for the different ways of living in society and reflect global inequalities. Therefore, "the interaction is much more complex than it would be if it was limited to cultural interaction since immigration is also regulated through many other different regimes and discourses" (Baber, 2012, p.143).

Immigration has evolved with social changes and, more recently, alongside the dualities of ghettoisation and globalisation, impacting how education is structured (Bartlett; Ghaffar-Kucher, 2013). Mathematics education of immigrant students has strong relationships with globalisation and racialisation, for instance (Valoyes-Chávez; Montecino; Guzmánc, 2021).

The Sustainable Development Agenda (SDG), adopted by the United Nations (UN) Member States in 2015, established 2030 as a deadline to fulfil seventeen goals. Migration and education are cross-cutting issues in this agenda. Worldwide, 281 million people live far from their hometowns and thirty-one million school-age children are international migrants. Their education is identified as one of the priorities by the UN. This context significantly draws attention to the challenges generated by migration towards the global goals of quality and accessible education for all, from local to global levels.

I find it crucial to analyse what occurs in mathematics classes with immigrant students, not only in terms of the implications of the language of teaching and learning on the development of mathematical cognition, but also in terms of the socio-political conditions of power relations (Baber, 2012) throughout lines of differences. Regarding immigrant students, such differences run through intersectional[128] lines. Students can be differentiated by aspects such as appearance, social inequalities, and immigration status, for instance. Xenophobia and racism emerge as categories which may refer to globalisation and ghettoisation (Penteado; Skovsmose, 2011). According to Skovsmose (2014):

> Process of globalization are stronger than educational processes. They influence the dispositions of many students, their motives for learning, as well as the learning obstacles they come to face. Nevertheless, I see the task of mathematics education as being to provide opportunities for students (p. 71).

[128] See more about Intersectionality in Chapters 2 and 3.

In the following sections, I reflect on possibilities for immigrant students. First, to understand the social context that this paper considers, I discuss globalisation and ghettoisation and how such concepts are related to mathematics education and immigrant students; also, I present the reality of schools in Brazil using the voices of mathematics teachers and immigrants. Afterwards, I address a theoretical discussion on *meetings amongst differences*. Finally, I address the possibilities of the hypothetical project *Ghettoisation—Is Racism a Factor?*.

10.2 Globalisation and ghettoisation

Globalisation is a crucial component of productivity within a neoliberal economic framework, where the world becomes a global village with common cultural references and new forms of social interaction (Heywood, 2010). However, it divides while it unites; the world increasingly becomes one, but at the same time it becomes more and more divided (Bauman, 1999; Morin, 2002). Globalisation is a contested concept. It has an indeterminate, undisciplined, and self-propelling character in world affairs and refers to contradictory social dynamics (Steger, 2017).

Accordingly, one can consider two aspects of globalisation. Firstly: the concept of globalisation has both positive and negative connotations. Secondly: globalisation affects the spatial displacements of populations worldwide.

The first aspect refers to the different processes of globalisation that do not take a straightforward and predictable route. There are interconnections between what appear to be unrelated social phenomena (Bauman, 1999). The actions and experiences of one group of people can have beneficial or harmful consequences for another group (Santos, 2008). On the one hand, there is a growing network and connection between people and knowledge. On the other hand, the establishment of exploitative hierarchies and power relations. Santos (2008) contends that the mechanisms underlying globalisation are neither good nor bad in themselves, but take on many characteristics depending on the ideology underpinning their use. According to Skovsmose (2008), "[…] the production of goods is accompanied by a production of 'bads', that might be in the form of pollution and damage to the environment, or the people involved in the production" (pp. 6).

The second aspect of globalisation is associated with the increase in international migration. Many people are displaced, driven by rising economic and social inequality across countries. Furthermore, globalisation generates a great acceleration of human use and consumption of natural resources, and contributes to worsening environmental crises. Such crises outstand issues such as human rights violations, structural racism, environmental

injustice, and ecological apartheid, for instance (Rosenberg, 2022). Inequalities manifest in geopolitics, economy, and work, and drive the displacement of populations (alongside the environmental and social crises).

These two features of globalisation indicate its dubious and contradictory character: creating a world without borders[129] but still being rife with exclusion and limitations. Globalisation seems to mean the erosion of national borders. However, contradictorily, it also means isolating certain groups through hierarchical and exploitative relationships and with different types of borders and forms of exclusion.

Eventually, progressive spatial segregation is an essential component of the contentious and conflicting nature of globalisation processes. Such segregation can be identified in the ghettoisation process (Wacquant, 2004). I consider the formation of ghettos as a negative result of globalisation by building a kind of spatial apartheid. This dynamic is racialised and may be connected to a hygienist perspective (which seeks to clean) of urban centres and groups of stigmatised people. The construction of ghettos establishes borders that delimit the supposed "parallel societies".

These two globalisation-related factors affect immigrant populations. As a result, they may face various forms of exploitation and suppression, caused by racism, intolerance, and assimilation processes (Valoyes-Chávez; Montecino; Guzmánc, 2021; Rosenberg, 2022). Additionally, the spatial displacements, driven by globalisation, may create a segregated contingent of immigrants through the ghettoisation process.

10.3 Mathematics education in a globalised world

Knowledge and information are strategic resources in a globalised world; the vectors that underlie globalisation are founded on scientific ideas based on the mathematisation of existence, due to our increasing fascination with numbers and the use of statistics (Santos, 2008). Simultaneously, there is a need for cultural homogenisation and monetisation of cultural differences within a context dominated by science, technology, and capital.

According to Skovsmose (2023), mathematics education is critical and is impacted by socio-political, economic, and cultural issues. The critical nature of mathematics education emerges from its power in marking divisions between those who are included and those who are excluded from society. It can function as a gatekeeper of participation in a global society.

[129] See more about border in Chapter 3.

Mathematics interacts with power and has political, technological, and economic significance. The power dimension of mathematics is tied to its inseparable role from the dominant background ideology of consumerism-capitalism (Ernest, 2008). Mathematics is put into operation in many different contexts; it can serve as the basis for planning, decision-making, and legitimising specific actions; it is part of the processes of globalisation and ghettoistion, operating in duality with inclusion and exclusion on a global scale, although it is challenging to identify how mathematics operates in such contexts (Skovsmose; Niss, 2008).

Mathematics education is part of the universal process of globalisation and competitive global society; it operates alongside the impositions and struggles for power. School mathematics traditions may be strikingly marked by the dissemination of dominant socioeconomic priorities and adaptation to the demands of the labour market in the current globalised capitalist order. Mathematics education can be seen as a scaffold to help you enter the social order, and it also becomes a border for exclusion from global networks (Skovsmose, 2007; Skovsmose; Niss, 2008)

When considering the education of immigrants, particularly those who endure extreme inequality and social exclusion, such an aspect of mathematics education is hugely relevant. It is critical to consider what mathematics education immigrant students receive. It can help to prepare them to accept the given order of the globalised informational economy, or, conversely, it can support democratic ideas and foster global and inclusive citizenship (Carrijo, 2022; Skovsmose; Moura; Carrijo, 2023).

According to Penteado and Skovsmose (2011), ghettos in society are reproduced in classrooms on a micro level; many mathematical processes shape the formation of such ghettos. They claim that:

> Ghettoes in the classroom emerge through complex processes of differentiation, where lack of prestige, poverty and stigmatisation turns into general discourses, which in turn coagulate as ghetto-walls. Breaking down such walls constitutes part of the construction of possibilities for students. (Penteado; Skovsmose; 2011; p.87).

In this sense, mathematics education is part of a universal and dubious process of inclusion and exclusion in a world of advancing globalisation. The duality of division and union might further widen the division between *wanted* and *unwanted* people, *south* and *north*, *west* and *east*, and strengthen or erase division borders from opportunities. This duality concerns ghettoisation and globalisation as challenges for mathematics education when constructing possible lesson projects for immigrant students.

10.4 Immigrants and mathematics teachers' experiences

Mathematics classes with immigrant students need to be analysed in terms of inclusion and exclusion (and thus, globalisation) and segregation (produced by ghettoisation). I present the accounts[130] of the lived experiences of immigrants and mathematics teachers in Brazil as elements of the social and educational framework to discuss possibilities for mathematics education with immigrant students. I present some excerpts from interviews that can give an impression of what is taking place in Brazilian schools with immigrant students.

Firstly, when asked about the influence of mathematics in his life, Haitian Max says how he understands that mathematics can affect the lives of immigrants.

> *Max:* I see it like this: if you're good at mathematics, that country won't want to lose you. You become very important to that country. You are not anyone. For a company, for a country, you can make a difference. If I'm good at math, I can get to any university, it could be Germany, it could be Paris, the USA, Canada, Brazil. The university won't want to lose you.

This speech expresses how discrimination and (un)desirability[131] towards immigrants can reflect on population movements worldwide. Indeed, such desirability reflects the power relation of mathematics in a globalised world according to its relationship with the production means, like creating and implementing new types of technology and information processing (Skovsmose, 2014). For Max, people with mathematical knowledge skills will likely be wanted (welcomed) immigrants in other countries.

Teacher Miguel's speech brings up essential elements about the dynamics involving desirability of immigrant students:

> *Miguel:* Acceptance is not the same. What I perceive is that there are some differences; for example, if the student is of Bolivian origin, acceptance is different than if he is Angolan or Nigerian or if he is Muslim. Acceptances are different in different contexts because many come because of the activity the family carries out here (in Brazil).

This report communicates the discriminations that immigrant students suffer according to distinctions that are not based purely on economic reasons, but rather represent intersectional approaches to xenophobia, racism, and social injustice.

Regarding the education of immigrants in Brazil, one can consider two types of students. On the one hand, there are groups of children of highly qualified professionals who migrate to Brazil intending to further their studies or advance their careers. For the most part, the children

[130] The speeches were translated from Portuguese into English, and participants' names are fictional to ensure their anonymity. I use ### to suppress words that can help identify the participants.
[131] See more about desirability in Chapter 3.

of these immigrants do not attend public schools. On the other hand, there are groups of children of people who move to Brazil to overcome poverty and escape conflicts and who end up working in low-status occupations. In general, the children of these immigrants encounter vulnerable circumstances brought on by social injustices. It seems Miguel is referring to this second group.

The speech of teacher Markus expresses the power of mathematics in constituting life possibilities for immigrants:

> *Markus:* The student wants to improve his social condition; he wants to express his citizenship. He wants to be a more important person. He goes after mathematics to have better conditions of life. To take a civil service examination, to join the police, to enter college. The role of mathematics is to offer conditions for him to ascend socially.

Nevertheless, teacher Lucas contest the power of mathematics in the school curriculum:

> *Lucas:* I see the number of things that are taught as absurd, regardless of whether it is Brazilian or not, I think it is absurd mathematics to be one of the subjects with the highest workload in the student curriculum. I think the teaching of mathematics is exaggerated from the beginning to the end. […] Of course, mathematics adds academic and scientific knowledge to them, but regardless of the public (students), it is an exaggeration.

The reports point out how the teachers see the power of mathematics both in the school context and in the social context. They say: “the student goes after mathematics to have better conditions of life”, and “It is absurd mathematics to be one of the subjects with the highest workload in the student curriculum”. The reports give a glimpse of what can mathematics be its relation to the inclusion and exclusion of immigrants in a globalised world.

Furthermore, such relations can also be expressed in the host country. Immigrants suffer the effects of social borders that are expressed in the dynamics of globalisation and ghettoisation. Miguel describes the region of the city that the school he teaches at is located in:

> *Miguel:* My interaction with immigrants was even more significant due to the school's location. For those unfamiliar, ### (region name) is a well-known shopping district in São Paulo. Around the school, there is an area exclusively for commerce. Basically, there are no residences but shops. Most of our students are children of people who either work as salespeople in retail stores or clothing production lines.

Teacher Miguel works in a school in a region where the neighbourhood is known for its many malls: “around the school, there is an area exclusively for commerce”. Most of the immigrant residents are families of Bolivian origin. About the immigrant students, he says:

> *Miguel:* Some students of Bolivian origin have a specific difficulty with the issue of taking a shower every day, keeping their nails clean, and not wearing the same

> clothes all week. For about two or three years, we had this meeting with the school coordinator about this - this is not typical. To help us grasp this better, someone from the social department shows us a small amount of the context. When the Bolivian people come to Brazil, they mostly come to work in the manufacturing sector. As a result, when we look at ### (region city name), the stores are townhouse models. At the bottom, the ground floor is the store. On the mezzanine floor, which is not very visible, is the production area, where they sew. In general, it's kind of unhealthy. We saw pictures of what their work context looks like. And due to the issue of poor salaries, it is quite common for Bolivians to live in very small accommodation that is meant for three people but accommodates ten people. Or with several rooms and only one shared bathroom for thirty people. So, when the Brazilian student says, "That student stinks, you can't go near them", it is clear that it is due to this situation.

Miguel reports the situation of vulnerability of some immigrant students at the school he works. Usually, such students and their families struggle with the difficulties of living in the same place they work, sharing overcrowded and degrading conditions housing: "the stores are townhouse models. At the bottom, the ground floor is the store. On the mezzanine floor, which is not very visible, is the production area, where they sew. In general, it's kind of unhealthy".

Markus, a teacher who teaches at another school with immigrant students in São Paulo, mentions the characteristics of the place where he works:

> *Markus:* We are in a pretty poor area of the city. ### (area name) is on the outskirts of São Paulo, next to a cemetery, with many communities around. It also has a large number of Haitian immigrant students. It's like a Haitian hub there.

Markus reveals that the school is located in a deprived city area. Haitian immigrants live in this peripheral and disadvantaged region, where a cemetery is also located. The school is situated in a remote region of the city and seems to have been founded as a result of ghettoisation.

One can consider such a segregated area of São Paulo, where Miguel and Markus work, as a ghetto of São Paulo. The segregation of cities into ghettos and commercial areas has led to significant social, cultural, and economic discrimination, often rooted in racial and cultural characteristics (Wacquant, 2004; Baber, 2012).

Markus further reports:

> *Markus:* Learning a high school equation is least important for immigrant students. What matters to them is being together with other Haitians. They want to speak Portuguese fluently to move up socially. Most Haitians arrive here in Brazil in a vulnerable situation, living in places that are not very well located, with a lack of internet, lack of pavemented streets, for example. Haitians are, therefore, in a vulnerable condition.

Markus draws attention to what he believes to be the primary needs of immigrant students: “learning a high school equation is least important for immigrant students. What matters to them is being together with other Haitians”. They are basic needs related to coexistence and dignified living conditions. On mathematical content, Markus explains:

> *Markus:* We do very basic things, taking into account the four fundamental arithmetic operations, percentage, and rules of three. No one will make a logarithm, a quadratic graph, or a maximum and minimum point. We don't get to that part, although it's in the curriculum.

Markus selects the mathematical content he may teach. For him, the more advanced mathematics content would be given in line with particular students’ needs. Given the conditions imposed on it—possibly class hours, students' level of instruction and attendance requirements, among other issues—this selection happens even if more advanced content is prescribed in the school's curriculum. It seems there is not much to expect from and hope for the students. “Ghettoising obstructs the construction of possibilities: Students become designated to return to the situation they come from: they need only to be ‘taught the basics’” (Penteado; Skovsmose, 2011).

The teacher’s attitude reflects a series of structural problems, ranging from social issues that reflect on the school to the teacher training and working conditions. What they might see as a way out is providing elementary instruction to the students, who are focused on even more basic needs of survival in another country.

The reports seem to bolster what Skovsmose (2008) states about some groups of people seeming not to be essential for the globalisation process. They have minimal access to the goods produced and are placed in a position of subordination. Mathematics can serve as an instrument that favours this marginalisation.

Markus adds some more information about the relationship between immigrants and non-immigrants in the classroom:

> *Markus:* I can say that Haitians who work dress very well; they are well dressed, well groomed. They are very concerned about appearance. It has its own style. Maybe that scares you a little. But that doesn't characterise a successful person. They go by bus or train to school. And this is not status. And the person who makes that kind of comment, they're looking for a different person. Either she is prejudiced about colour, or she is xenophobic about the country, or she wants status. It's not common for us to see a Haitian get there by car or motorcycle, which would demonstrate that the person has a little more condition. And oddly enough, Haitians don't seem to understand that they suffer from racism or prejudice.

In his speech: “It has its own style. Maybe that scares you a little. But that doesn't characterise a successful person. They go by bus or train to school. And that's not status” indicates a flagrant discourse of differentiation that is often based on a We-Other dichotomy. The “Other” comes from a poor community; they must travel a lot to get to school; they look poor; they have different behaviours. The characteristics of “Other” are not attractive but refer to limitations, flaws, defects, and weaknesses (Penteado; Skovsmose, 2011). The “Other” becomes formed through discursive patterns of differentiation that hide a structural racialisation question. The teacher adds: “And, incredible as it may seem, Haitians do not seem to understand that they suffer from racism or prejudice”.

Ghettos in the classroom are created when differentiation turns into a We-Other dichotomy. They arise from profound labelling, and many students find themselves in such ghettos (Penteado; Skovsmose, 2011). Accordingly, the teacher adds:

> *Markus:* They (immigrant students) communicate with each other and end up passing information to each other. And that ends up calling several of them to study there. For example, the ### (school name) is a school that has a lot of Haitians. They meet there and form groups among themselves. They end up talking to each other, looking for things in common. They frequent the same rooms. They (immigrant students) are so loyal that the enrolment number only grows.

Teacher Lucas also reports segregations in his classes:

> *Lucas:* The students from South America, they have a very large community, speaking Spanish and Castilian. They approached each other, but you see a certain rupture, a group of immigrants and a group of Brazilians. Eventually there was the separation of foreigners and non-foreigners, something natural in my view, the separation so that the teacher could notice each one. There was interaction, but you could quickly see the separation of groups.

This information relates to the isolation that immigrants may face. Apparently, they are looking for spaces where they are recognised and feel included: “they end up talking to each other, looking for things in common. They frequent the same rooms”. Thus, they begin to form groups in the classroom, school, and city. The accounts relate mathematics to life possibilities for immigrant people which may play a role in establishing ghettos. Lucas says: “you see a certain rupture, a group of immigrants and a group of Brazilians. Eventually there was the separation of foreigners and non-foreigners”. It also seems that the process of ghettoisation in society is reproduced at the micro level of mathematics classrooms. However, mathematics can still provide opportunities to go beyond these ghettos. This has to do with the variety of roles for mathematics in globalisation.

Thus, as people move out of their countries, mathematics education becomes a tool for furnishing second-class citizens for low-skill jobs (Valoyes-Chávez; Montecino; Guzmánc, 2021). The cycle of exclusion prevails, and social apartheid is strengthened. Factors such as opportunities and reasons for learning mathematics might also be affected. The context presented by Miguel and Markus brings our attention to the vulnerable reality of immigrant students and the spatial segregation through which they pass living in Brazil.

These reports provide inspiration for addressing possibilities for building inclusive and democratic environments for mathematics learning. Questioning the manifestation of globalisation and ghettoisation in mathematics education with immigrant students and how they are affected in teaching and learning mathematics leads to us reflecting on the possibilities of *meetings amongst differences*.

10.5 Meetings amongst differences: Local meets global

In this section, there is discussion on the following topics: *meetings amongst differences* require dialogue and tolerance; and such a meeting *can be a meeting amongst global and local differences.* Skovsmose (2019) addresses the *meetings amongst differences* in mathematics classes and highlights that differences can be of all kinds: cultural, marked by racism and gender, by physical and intellectual abilities, different life experiences, and different fulfilled and frustrated dreams, but also different hopes, priorities, opportunities, perspectives, and aspirations.

Such a meeting is based on the human ability to be like the other, experiencing mutual relationships in motion to discover and be aware of the new, and be open to the new learning possibilities that may arise from this meeting (Skovsmose, 2019; Moura, 2020). The differences and particularities of each student are considered a resource, regardless of age, nationality, physical traits, or economic status, for example. This is achieved through mutual understanding, an interest in traditions and beliefs, and sharing common ideas. Differences are not borders that disable or justify the subjugation of certain groups of students.

Meetings amongst differences in mathematics classrooms require dialogue and tolerance. Regarding dialogue, according to Faustino (2018) and Moura (2020), a democratic engagement between teachers and students takes place through a dialogic relationship. *Dialogue* is an element that contributes to the collaborative learning of mathematics from the standpoint of appreciation and sharing perspectives, in the sense that no one is barred from their right to expression. This implies active listening, acknowledging other points of view, expressing their worldview, being heard, and being considered. In this sense,

classroom communication and interaction patterns might differ from those patterns' characteristic of the school mathematics tradition (Faustino; Skovsmose, 2020; Skovsmose, 2023).

Meetings amongst differences urge tolerance. According to the United Nations Educational, Scientific and Cultural Organization (UNESCO, 1995), *tolerance* means respect, solidarity, and acceptance of humankind's diversity. This means valuing the rich diversity of the world's cultures and ways of expression. For Freire (2017), tolerance is a virtue with the ethical quality of human coexistence, of living with those who are different and not with those who are inferior. In other words, tolerant people are not tolerant because they are superior in terms of race, gender, or knowledge in the face of the tolerated, but rather because they see someone with a condition different from their own in the other person.

"Tolerance demands respect for what is different, their dreams, their ideas, their options, their tastes, not denying them just because they are different" (Freire, 2017, p. 26)[132]. The lack of tolerance fosters authoritarian relationships based on the notion of superiority that some create over others, which is critical to competitive globalisation and the power of mathematics.

Meetings amongst differences in mathematics classes are opportunities to overcome the *We-Other*[133] dichotomy in the sense of not being perceived as less important or inferior, but being noticed and recognised as essential features that can influence the motives for learning mathematics. They provide a way of coming together across borders to foster new knowledge and thinking cooperatively. It is possible to learn about cultural, linguistic, religious, physical (etc.) multiplicities, overcoming the view that immigrants are strange or exotic, which demands respect for diversity. It requires valuing all the knowledge and experiences involved, which means not considering immigrants as "foreigners" who are intellectually and culturally inferior.

In this sense, I see meetings amongst differences in mathematics classes with immigrant students as meetings amongst global and local differences. With the term "global", I refer to geographical issues from the perspective of the globe, and also to a collective of a group. With the term "local", I can either refer to the sense of specific territory, but also to the individual, to the particular, to what is singular but representative. Local and global resemble the relationship between inside and outside, moving towards crossing borders. According to Chronaki and Yolcu (2021):

> The meeting of global and local is far from being reductive and assimilative but it generates a set of power relations and enables further production of

[132] Translated from: "A tolerância de demanda que se respeite o diferente, seus sonhos, suas ideias, suas opções, seus gostos, que não o negue só porque é diferente" (Freire, 2016, pp. 26).
[133] See more about *We-Other* dichotomy in Chapter 4.

> discourses and practices for school mathematics. Current reform efforts and policies to internationalise school mathematics share the aspirations of a cosmopolitan worldview whilst they simultaneously embody the historical premises and cultural rules of local contexts that (re)produce particular humankinds and fabricate their differences into a hierarchy (p.244).

Roux and Swanson (2021) claim that notions of the global and local, the citizen, mathematics, and mathematics education must be critically brought together to avoid inadvertently reproducing the inequities they seek to disrupt.

I am aware of the danger of binaries, and I instead use the notions of local and global to foster the idea of perceiving the world beyond a local perspective, and leaving behind the classroom situation in which the immigrant students are mainly seen by what is strange, eccentric, or exotic. Thus, immigrant students can be global through the imagery of movement across the planet between countries. However, they are also local, since they represent a particular culture or group of people. We can think of such characteristics also for non-immigrant students. Thus, every student is considered both a global and local representation.

Educational environments, aware of the *meetings amongst global and local amongst differences*, may foster immigrant and non-immigrant students to get to know each other. They can recognise each other and see that local and global problems are intertwined. The ability to see a problem from a perspective that is not individual fosters the capacity to share mutual vulnerabilities to inspire the desire for justice.

In this sense, students can share their realities and experiences, perceptions, and perspectives, as well as learn from various perspectives and ways of being and existing in the world, with no hierarchical and devaluing judgments wrapped in veiled racist manifestations.

Meetings amongst global and local differences are a critical primordial factor in facing the exclusions experienced by immigrant students. Accordingly, such meetings can be part of actions against the grain of segregation produced by ghettoisation. They may provide resources for critical activities and take the form of collective investigation processes. Such activities are shared and worked on jointly by students, as in the project *Ghettoisation—Is Racism a Factor?*.

10.6 *Ghettoisation—Is Racism a Factor?*

This paper aims not only to interpret what takes place in classes with immigrants in Brazil, concentrating on the current situation, but also to study alternatives to this situation. Through pedagogical imagination, it is possible to create an imagined hypothetical situation as an alternative to the current situation (Skovsmose, 2009; Lima; Penteado, 2021). An imagined

hypothetical situation does not come out of nothing. Concepts such as globalisation, immigration, inclusion, and social and racial justice are some resources to consider.

According to Gutstein (2012), mathematics can be an effective tool to act against social injustice, and students need to be prepared through mathematics education to explore and critique injustice. The author developed a project called *Mortgage Loans—Is Racism a Factor?*[134] with students at a school in Chicago, within the United States of America. The students were required to investigate the mortgage rejection rates for whites, Latinx, and African Americans in Chicago. The central question was: given the data, is racism a factor in getting a mortgage in Chicago? They read a newspaper article, analysed data, answered several questions, and wrote an essay arguing whether or not they believed racism was a factor, supporting their arguments with mathematical data.

Based on this example, it is possible to consider developing an imagined hypothetical project for mathematics classes with immigrant students: *Ghettoisation—Is Racism a Factor?*. Based on a variety of sources – videos, articles, and newspapers – students can seek information about neighbourhoods in the city with the largest population of immigrants and how immigrants are spatially distributed in the city where they live. They may collect information about living conditions in different neighbourhoods, regarding infrastructure and access opportunities; explore maps or charts that depict the spatial distribution of populations and resources in different areas; and identify areas that exhibit signs of segregation and discuss the implications of these patterns. This project's potential lies in considering the reality of students that could be participating in mathematics classes.

If the project *Ghettoisation—Is Racism a Factor?* was developed in the city of São Paulo, this information could be collected on the map of inequality[135] of the city, where indicators are brought annually and reveal the socioeconomic gap between the richest and poorest regions, under the bias of themes such as housing, human rights, population, among others. They could explore concepts like redlining[136] and discrimination in housing markets, as well as analysing statistical data, such as income disparities or educational opportunities, to understand the connection between these factors and ghettoisation.

In the classes of teachers Markus and Miguel, for instance, an immigrant student from Haiti and Bolivia can share other approaches to mathematics and how their cities and countries

[134] See more in: http://rethinkingschools.org/wp-content/uploads/2020/06/RM-racismInMortgagesAssgnmnt.pdf
[135] See more in: https://www.nossasaopaulo.org.br/wp-content/uploads/2022/11/Mapa-da-Desigualdade-2022_Tabelas.pdf/
[136] Redlining refers to a discriminatory practice in which financial institutions, such as banks and insurance companies, deny or restrict access to credit in specific geographic areas, often inner-city neighbourhoods.

are spatially organised, reflecting on questions such as whether racism is a marker of inequality. Each student matters in the process of teaching and learning mathematics. The multiplicities, specificities, and individualities of immigrants and non-immigrants must coexist in the same space.

Finally, they can argue whether or not they think racism is an issue related to geographical distributions, supporting their position with statistical evidence. They can take part in collaborative processes of inquiry and argumentation. In general, an exchange between ghetto schools and other schools could also be a possibility for this project.

For this project, it is crucial to bear in mind that learning is improved when school mathematics serves not just as a window through which to see the outside world, but also as a mirror through which people see themselves and their families (Gutiérrez, 2007). This means that mathematics classes must ensure that the content reflects both the students and their communities. However, the students cannot be forced to carry out investigations (Skovsmose, 2023). Thus, students are invited to investigate through *meetings amongst differences*.

10.7 Last comments

Globalisation is a dubious concept; it unites while separating; it operates in duality with inclusion and exclusion on a global scale. International immigration intensifies at the same time as ghettoisation takes place. Ghettoisation has to do with isolation, exclusion, and discrimination. Immigrant populations are affected by exclusion and segregation processes by ghettoisation, which may reinforce xenophobic and racist actions. This signals what appears to be an apartheid that can be linked to racial categories.

Mathematics education is critical and can work in favour of globalisation’s dubious and contested meanings, as well as being related to its positive and negative connotations. It can consider issues related to international immigration as something secondary in which mathematics education would be complicit while indifferent and inert to the violence suffered by immigrant students; or it can take a stand in favour of possibilities of a less perverse globalisation, in which the techniques and human advances conquered so far are at the service of a humanised globalisation.

Max, Miguel, and Markus's reports illustrate the vulnerable situation of immigrant students in Brazil. Such a situation requires educational policies and programmes to strengthen dialogue and tolerance among racial, socioeconomic, cultural, religious, and linguistic groups, as well as fostering recognition of differences and sharing worldviews through mathematics in a movement of learning with both immigrant students and non-immigrants. The accounts of the

lived experiences of immigrants and mathematics teachers constituted elements of the social and educational framework. Such elements were crucial for discussions about possibilities for mathematics education. The accounts drive theoretical findings with implications for creating imagined pedagogical possibilities.

Through *meetings amongst differences*, students are invited to study the world, question it, and reflect on its possibilities with global awareness. Students are invited to find patterns that may have previously been invisible, challenge assumptions that seem no longer self-evident, and become critical thinkers, problem solvers, and advocates for a more globally equitable society.

Mathematics classes with immigrant students are fertile environments for students to get to know each other and the world, going from a local to a global perception and realising their place in the world. It demands *tolerance* across racial, socioeconomic, cultural, religious, and linguistic groups within countries.

I see *meetings amongst differences* through the project *Ghettoisation—Is Racism a Factor?* as a practical possibility, with regard to both education in schools in the ghettos, and also outside the ghettos. It is a possibility in different regions around the world, as well as being a possibility for communication between students from different schools, and communities.

Ghettoisation—Is Racism a Factor? does not follow a specific pattern, nor can it ensure predictability of results. Besides, meeting for collective investigation processes implies unexpected situations, possible emergences of affection and surprise, discomfort, autorecognition, and intrinsic tensions. Such a project may provide students and teachers with a zone of uncertainties, unpredictability, and concerns, a *zone of risk*[137]. However, a zone of risk is also a zone of imagination and possibility (Skovsmose, 2019).

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[137] For a discussion of the notion of risk zone, see Penteado (2001).

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SECTION D- REFLETING AND CLOSING

Epilogue

11 LAST CONSIDERATIONS

 I wish I knew how
It would feel to be free
I wish I could break
All the chains holding me
I wish I could say
All the things that I should say
Say 'em loud say 'em clear
For the whole round world to hear.
Nina Simone

In this last chapter, I want to use this space to reflect on what this research represents for me: a snippet within a collaborative process of thinking mathematics education for inclusion and social and racial justice. This snippet is the result of processes that happened *before* the search even happened (I talk about this in Chapter 1, where I discuss my personal and academic life experiences). This snippet is also the result of a process *during* the research itself and continues as a process that can influence the *post-research*. In subsequent sections, I discuss what the post-research process could mean in terms of its results, impacts, and future inspirations.

11.1 About the research process

This research was marked by numerous challenges and uncertainties, as well as possibilities. As a researcher, I traversed many roads in the research process: roads full of intersections, potential, but also obstructions and uncertainty that led to creatively exploring alternative routes and maps of possibilities. This was reflected in the way of researching, in the themes raised, and in the analysis process.

Such a process was impacted by the Covid 19 pandemic situation. The research, which was initially planned to take place in a public-school environment (in São Paulo) and with immigrant students, needed to go through a necessary rethink of ongoing procedures, thinking up methods, making decisions on research conduction. I had to deal with uncertainties in the data production process and learn how to produce data remotely. In addition to the uncertainties about the research itself, the pandemic also brought anguish in my personal life: fears, moving to another city, changes in routine, social distancing, among other things.

In such a situation and considering that this research involved many people directly and indirectly in its process, I had to embrace everyone involved: myself (as the researcher), my teacher advisor, my supervisor abroad, collaborative research participants, my research group,

and fellow researchers from different areas. It was necessary to embrace their circumstances, limits, absences, expectations, and choices so that this research was possible and became research of possibilities.

Therefore, this research turned into an investigation driven by questions like: How is mathematics education structured for the inclusion of immigrant students (or how can it be)? How does the power of privileges provided by mathematics contribute to social and racial exclusion? How can anti-racist mathematics education include immigrant students? Seeking to answer such questions, this research aimed to discuss possibilities for inclusive mathematics education that combines the reality of immigrant students with reference to structural racism.

The research followed a qualitative approach with methodological inspiration from Critical Inquiry (Crotty, 1998; Lather, 2004; Denzin, 2015) and Constructivist Grounded Theory (Charmaz, 2017; 2021), as well as creative possibilities, composing its own way of researching. Data production comprised several processes: *researcher definitions, theoretical framework, reports,* and *expression resources*. The reports were produced through semi-structured interviews with fourteen participants who live in the state of São Paulo - mathematics teachers from public schools, and immigrants from Venezuela and Haiti. All the material produced created a *window*, through which it was possible to look at a current situation and make an analysis based on themes that direct the gaze to a social and educational scenario.

Still thinking about the research process, part of the studies for this dissertation were carried out in Austria, during a doctoral internship at Universität Klagenfurt. During this period, in addition to meeting several theorists and encountering other theoretical perspectives that contributed significantly both to the data analysis and to the theoretical framework, my research also expanded to establishing contact with immigrants and refugees from different countries. I had the opportunity to interview a family of Ukrainian immigrants living in Austria, for example. [138]

I experienced being an immigrant in another country, even though I was in the privileged position of a visiting researcher. Those experiences brought me more awareness of aspects of Brazilian culture, in the contexts of international immigration, which helped me to reflect on the intersectional structures about inclusions and exclusions that the immigrants participating in the research brought in their reports. I realised that the more I distanced myself from the reality of my research context, the clearer many reflections topics became for me. I was also affected by reflections on the differences between living and studying in Brazil or on European

[138] This interview was not used in this dissertation and will be used for future publications.

soil, after participating in courses and workshops and interacting with researchers from different areas of knowledge and from different countries worldwide. My doctoral internship took place in the midst of the pandemic and my PhD qualification process. Thus, the works and experiences in this period had a significant impact on the directions and reflections of this doctoral dissertation.

11.2 About intersectional topics

For the research, I was in contact with several scholars and researchers who dealt with issues of immigrants, racism, social justice and inclusion, citizenship, and who discussed issues related to students belonging to invisible or racially oppressed groups. This contact was important as the constitution of the theoretical framework and analysis process. I realised the need for mathematics education to be inserted in intersectional discussions in a tangle of multiplicity and plurality as shown in this study. The disparities influenced by systemic racism, language barriers, cultural biases, and discriminatory policies may limit opportunities for immigrant students to excel in mathematics education.

As I emphasize in the dissertation, the current immigration situation should not be configured as an immigration crisis but as a humanitarian crisis, but as a result of political, economic, and humanitarian crises that result in contingents of people in situations of vulnerability. For example, the war in Ukraine[139], draws attention to being particularly challenging for black people who, even during a life-and-death situation, have found themselves running into racist barriers while trying to reach safety and freedom. When thoroughly examined, bloody conflicts in Syria, Somalia, and other countries have not attracted the same level of international media attention or urgent political response that the invasion of Ukraine has[140].

This led to a study and discussion in the light of a broad theoretical repertoire. One can think that many of the discussions in this dissertation could be the focus of other diverse research areas or subjects. This is absolutely true. This study does not bring discussions that can only be interpreted by the community of scholars and teachers in the area of mathematics education. Thinking about including immigrant students in math classes made me open to working together with other areas of knowledge. And so, I needed to extrapolate the

[139] The invasion of Ukraine by Russian troops in 2022 is the result of an ongoing international conflict between Russia and Ukraine.
[140] See more in:
https://www.dw.com/en/ukraine-war-african-students-face-russian-missiles-and-racism/a-61356066

productions in the area of mathematics education and drink from theories from different areas of knowledge. What this research proposes means thinking about community, cooperation, considering other points of view.

Therefore, this study takes place about the intersectionalities that permeate mathematics education, racism, immigration, and inclusion, going beyond concerns with language barriers on the development of mathematical cognition in teaching a specific content. Thus, I focused on debates about racism within the context of Brazil, confronting a considered racial democracy. It is still believed by many that people in Brazil do not see race (colour-blind neutrality), and any trace of racial discrimination has been eliminated. Contrary to this, I argue that racism is alive in Brazil, and it is a critical factor in understanding student experiences and performance at school, and dwells in the mathematics classroom configuring discourses, pedagogical practices, and interactions.

The assumptions of Critical Race Theory cross over the whole work by uncovering the ways in which xenophobia has acted as a tool to ensure the subordination of migrant groups unwrapping the roots of imposing whiteness as the norm. Agreeing that we need to support research into the importance of race and racism for mathematics teaching and learning, involve students in discussions about race and racism, and challenge presumptions about mathematical ability (Martin, 2009; Nazemi, 2020), this research brings intersectional discussions that traverse all four sections into which this written material is divided.

Session A sought to build a theoretical basis for the study, discussing national and international concepts and research that deal with racism, immigration, and inclusive mathematics education. Chapter 2 addressed social structure and prompted an examination of structural racism, discrimination, and exclusion with special attention to the Brazilian context. Chapter 3 discussed social borders as inequalities that reinforce the desirable and unwanted immigrants' categories. Chapter 4 discussed the elements that make up inclusion according to this dissertation, considering the *We-Other dichotomy* as a border to the inclusion of immigrants. Such inclusion is an expression of concerns about well-maintained hierarchical structures that legitimise the oppression of racial minorities, cut across the educational spaces, and consider critical, democratic, liberatory and humanising education for all as crucial components.

In Section B, the methodology, the data production procedure, and the way in which they were organised and analysed in the research are highlighted. Chapter 5 details the methodological choices made to conduct the research, including planning, reflections, and decisions made, which are intrinsically related to the political and social context in which the

researcher and the research participants find themselves. In this research, the object of study is the social scenario for which the data opens windows and understand the potential for mathematics education and for the theoretical discussions. Chapter 6 emphasises some excerpts from the interview with immigrants and mathematics teachers, with elements that contributed to the construction of ideas and concepts discussed in this work.

Section C, written in the format of scientific papers, defined key research concepts discussed and produced as a result of data analysis, and described imagined projects that could be incorporated into mathematics classes. Such papers have distinct specific objectives and, together, bring significant elements to answer the research question. Chapter 7 discussed racial stigmatisation, stereotypes, and intersectionality to shed light on how stereotypes can affect students' experiences in life, as well as their perceptions of mathematics. Racial stereotypes may perpetuate the notion that certain racial groups are inherently less capable in mathematics and immigrant students might face prejudices that interfere with their ability to learn.

Chapter 8 proposed conceptual investigations on mathematics education for global citizenship, focusing on the reality of immigrant students with an understanding of the global community and with reference to structural racism. It elaborated on what it could mean for mathematics education to be for global citizenship. Using the notions of landscapes of investigation, lived democracy, and classrooms as learning communities, the landscape of investigation *Global Mobility* was imagined, which goes towards the inclusion of immigrant students and construction of tolerance as an expression of shared concerns and coexistence.

Chapter 9 focused on unwrapping the processes of exclusion and violence against the immigrant population, reflecting on what inclusion and inclusive mathematics education with immigrant students could mean, which goes toward glimpsing the roots of what can obstruct such a process. Reflections from research participants illustrate situations where subtle microexclusions may arise. The obstructions to including immigrant students have to do with various levels of oppressive social structures. Four types of microexclusion were identified: exoticisation, misleading identification, second-class citizen treatment, assimilation, and misprise.

Chapter 10 focused discussion on globalisation as a dubious and contested concept, since it unites while separating and operates in duality with inclusion and exclusion on a global scale. Furthermore, on the understanding that ghettoisation has to do with isolation, exclusion, and discrimination, I addressed the hypothetical project *Ghettoisation—Is Racism a Factor?* as a possibility to help us consider the reality of immigrant students and consolidate meeting

spaces in mathematics classes to overcome the distances created by ghettoisation. This includes addressing inequitable resource allocation and discriminatory tracking practices.

Overall, the discussions brought in the analysis papers point out that immigrant students may bring different mathematical practices and perspectives from their cultures of origin, enriching the learning environment. By providing opportunities for all students to engage in meaningful mathematical discussions and collaborative activities, their place in the world perception can be expanded. It underscores the approach to recognising and valuing students' diversity to make mathematics education more inclusive and accessible. This involves fostering students' sense of human coexistence, by a particular interpretation of living with those who are different rather than those who are inferior.

11.3 About impact

As I said, I see this research as a snippet within a collaborative broad process of thinking about mathematics education for inclusion and social and racial justice. Thus, the results of this research must be understood as part of the efforts that are intended to join the efforts of a community of scholars (from different fields) that together can contribute to a cumulative social impact. When I say cumulative impact, I mean the combined effects of one or several actions plus those of the past, present, and even from the future so that together they impact a given context. That is, this research is one among other contributions and does not intend to make any impact individually.

The main findings of the research indicate that the discussion about migration and education, as well as the specificities of teaching for these populations, is still scarce in Brazil, although the country is on the route of international migratory movements. Thus, one of the original aspects of this doctoral dissertation lies in addressing the ongoing conversation within the field about immigrant students and processes of racialisation within mathematics education, in a field that has mostly, according to Civil (2012) been dominated by Eurocentric and North American views of racial relations.

This research contributes to uncovering ideological mechanisms as located in a social context and reflects on school mathematical practices and discourses that reinforce and reproduce racial privilege within the context of structural racism. It contributes to unveiling and understanding racism within mathematics education from a global perspective, and to challenging the myth of receptivity and racial democracy in Brazil.

The results of this research allowed for important reflections about ways we might challenge ourselves to cross borders in inclusive and anti-racist mathematics education.

Although this study has tried to offer some perspectives and approaches to challenging and expanding such borders, it is important to note that this study is not about suggesting a new and different mathematics education directed to immigrant students, as those who need to be rescued and intervened to become future citizens - by incremental changes dependent on the benevolence of non-immigrant people. These intentions would be focused on excluding paradigms that masquerade as customs of inclusion. This dissertation is neither meant to provide any conclusive answers nor come up with ready-made recipes for mathematics classes.

Rather, this study brings indications that serve to provoke questions and inspire the community and mathematics education researchers to further understand existing borders and their role in the field. The objective was to reflect and discuss how to promote the appreciation of diversity, and cultivate empathy and understanding among students. This included consideration of developing critical awareness about racism, equality and social justice, and how to challenge stereotypes and prejudices through mathematics. The participants' reports join the news and personal researcher experiences to point out that the experiences pointed out are not isolated cases, but that they illustrate a broader and more complex context.

However, reports of immigrant students nor their school contexts were not explored. Thus, one of the contributions of this research indicates the need to investigate and expand the discussions about concepts like the identity of immigrant groups and also investigate the imagined projects proposed for the real context of the classroom. Further discussions for the future may take place on how to incorporate it into the mathematics school curriculum and mathematics teachers' formation.

I am not aware of any of these projects, with such formulations, having been previously developed in a mathematics class. I am aware that there are challenges posed by such imagined projects that can be ambiguous and uncertain. For the proposed environments to work, attention must be paid to creating a safe and inclusive environment for students to express their opinions and experiences, while being encouraged to cultivate empathy and understanding. It is necessary to consider the adjustments needed to address complex social issues and consider the age of students, as well as the complexity of mathematical content that can be addressed in a given school grade. Furthermore, care must be taken not to create a hierarchical environment in which immigrant students are the ones in need.

The outcomes of this research confirm that mathematics education, through contemplating context with immigrant students, can expand its discussions towards inclusion in a broader and more critical outline. Thus, the results of this research affect future perspectives of the researcher and of the research itself. In this sense, by bringing to light racial

discrimination within mathematics education in racialised social systems, this study contributes to unveiling and understanding racism within mathematics education.

11.4 About community and hope

Bell Hooks (2013) advocates for a "teaching community" as a way of teaching and living with hope. "Forging a learning community that values wholeness over division, disassociation, splitting, the democratic educator works to create closeness" (p.49). Seeking community-building, one considers the world as a classroom and works to sustain hope and create community with justice as the core foundation.

As discussed in this dissertation, inclusion does not just mean coming together and sharing the same space. The outcomes of this research confirm that inclusion is about community and acting for the common good. Thus, education for inclusion aims to prepare citizens to live in a diverse community, engaged in anti-racist and peace-seeking actions, which leads to breaking a culture of domination, and confronting structures that cause us to behave in ways that perpetuate domination. This means that it is not a matter of welcoming diversity in the sense of doing favours or confirming a position of superiority in relation to "the needy who so much lack the kindness of the fortunate and privileged". But it is about confronting paradigms of domination, privilege, and normalisation. This refers to strengthening and nurturing the existence of diversity. It has to do with engagement, relationship, involvement, and commitment to a larger world, exploring different perspectives.

Delgado and Stefancic (2017) suggest a question about a supposed magic pill that could eradicate racism from the world. Or about an imagined very educational seminar which is successful in fully eliminating cruel thoughts, stereotypes, and misperceptions from its participants. Would those possibilities make a significant difference in the lives of persons who are victims of racial prejudice and discrimination? Would education be one of the components of that miracle pill or a pillar of that seminar? I question: Would mathematics education be part of the formula for a medicine that would help to cure the world of racism?

Certainly, racism cannot be cured with a pill, because it is not about eliminating racism in its individual manifestations. It is vital to comprehend the entire structural organisation where racism is only one of its arms. Just pointing out unacceptable actions from the students, for example, is not enough to abolish racism through mathematics education. "The structural view on race relations leads us to conclude that legal accountability is not enough for society to stop being a machine that produces racial inequality" (Almeida, 2019, p. 36). And acting only in one

area, in isolation, is not enough to make the chasm left by years of racial inequality in Brazil be remedied.

In this sense, I do not see mathematics education as a way to "cure" racism by shifting students' beliefs. Racism is not a matter of individual behaviour and irrational thoughts. Thus, going beyond pointing out that racism is wrong, mathematics education must be aware that the alternative is to consider the systemic roots of racism being aware of complex social scenarios influenced by the diversity of people. This scenario demands many layers of change in order to avoid the system simply absorbing any minor gains achieved, with everything returning to its previous state: people being blind about the importance of relating to one another, not being against each other.

However, the steps for struggling against racism, even if they are small steps, must be persistent and considered by mathematics education and also take into account the immigrant population. Thus, the discussions in the dissertation stemmed from looking at a structurally racialised society and challenging racism, white supremacy, and thinking about inclusion.

According to Freire (2015), “the fight for hope means the frank denunciation, without mincing words, of excesses, frauds, omissions. By denouncing them, we awaken in others and in ourselves the need, but also the taste, for hope.” (p.114). This study is about denunciation and also about hope. It is about how we can use mathematical knowledge to strengthen the learning process for hope and recover our collective awareness of diverse community spirit to build bridges to overcome borders.

I hope this dissertation provides a space for much-needed reflection and motivates other research on the role that social borders play in mathematics with immigrant students. By including other intersectional elements, calls for continual reflexivity about how our positionality can be embedded in power structures and relationships of which we had been unaware. I also hope this research contributes to the work of scholars across the globe committed to unveiling, understanding, and fighting against racism within and through mathematics education, confronting modes of traditional mathematics education that feed oppressive systems.

I hope this doctoral dissertation inspires readers to examine borders in which they find themselves and to step outside those borders for the purpose of improving mathematics education with immigrant students. By advocating for systemic changes, educators can work towards creating a more inclusive and equitable mathematics education system with diverse representation in both curriculum and teaching materials.

In times of uncertainty, setbacks, and war, international immigration brings us closer to people from the most diverse backgrounds and foregrounds, putting us in contact with different modes of existence. The classrooms that are configured in a space of belonging, mutual knowledge, and appreciation of differences also allow the connection of education with a territory that goes beyond academic training, towards developing humanisation, to make the classroom a place that is life-sustaining and mind-expanding, a place of liberating mutuality where everyone works together in partnership. Restoring our sense of connection and closeness to the world has to do with the quality of the relationships established in the classroom, making mathematics education a practice of freedom to cross borders built on racism to build community.

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12 APPENDIX

Questionnaire:
https://docs.google.com/forms/d/1La6KoopUPOcuIFJp4wFiQIKmIEmcom6G0gBgmxpv-PQ/edit?usp=drive_web

Interview script with immigrants

QUESTÕES

Parte 1: Relativas ao Background

1. Por que e como sua família se mudou para o Brasil?
2. Você percebe a presença da matemática nesse processo de mudança?
3. Como você caracteriza o processo de acolhida a pessoas imigrantes no Brasil?
4. Você sofre ou já sofreu algum tipo de preconceito ou injustiça? Como foi?
5. Você frequentava a escola no seu país? E seus filhos?

Parte 2: Relativas ao momento presente

6. Como é sua relação com a cultura e tradições do seu país?
7. Cite três palavras que descrevem o sentimento de ser um imigrante no Brasil. Por que essas palavras?
8. Você gosta da escola onde seu filho estuda? Por quê?
9. Você acha que o fato de ser estudante imigrante deve ser considerado nas aulas de matemática?
10. Onde a matemática te ajuda na vida hoje?
11. Você acha que saber matemática é importante? Por quê?
12. Você acha que a avaliação de matemática leva em consideração o fato do seu filho ser um estudante imigrante? Como?
13. Quando você pensa em pandemia, que palavra melhor descreve o modo como se sente? Por quê?

Parte 3: Relativas ao Foreground

14. Como você se imagina daqui a 10 anos?
15. Você acha que a matemática pode te ajudar com esses planos de futuro? Como?
16. Você pensa que o fato de você ser um imigrante influencia em como será seu futuro no Brasil? Como?
17. O que você acha que poderia mudar em uma aula de matemática dos seus filhos?
18. Como a matemática pode contribuir para a qualidade de vida do imigrante?
19. Você vê relação entre matemática, racismo e xenofobia?

Source: Produced by the author

Interview script with teachers who teach mathematics.

QUESTÕES

1. Quais as especificidades de se ter estudante imigrantes nas aulas de matemática?
2. Como você percebe o processo de interação entre estudantes imigrantes e nativos?
3. Como você leva em consideração os estudantes imigrantes no planejamento das aulas de matemática?
4. Como deve ser uma prática que considere as diferenças em sala de aula e busque a inclusão de estudantes imigrantes?
5. Como você realiza a avaliação da aprendizagem de estudantes imigrantes?
6. Como compreende o impacto da avaliação da aprendizagem em matemática em estudantes imigrantes?
7. Como você relaciona a matemática com situações de discriminação com estudantes imigrantes?
8. Como percebe o modo como o contexto de pandemia e isolamento social tem impactado as aulas de matemática?

Source: Produced by the author

13 ANNEX

Annex: visual resources for the interview

São Paulo, terça-feira, 28 de setembro de 2010 FOLHA DE S.PAULO **cotidiano**

Texto Anterior | Próximo Texto | Índice | Comunicar Erros

Bolivianos pagam para não apanhar em escola estadual

Alunos estrangeiros de colégio no Brás têm que dar dinheiro e lanche a colegas brasileiros que os ameaçam

Direção afirma que casos de violência são combatidos; Secretaria da Educação diz que vai investigar situação

RAPHAEL MARCHIORI
COLABORAÇÃO PARA A **FOLHA**

ANEXX: TEACHER DOCUMENT

TERMO DE CONSENTIMENTO LIVRE E ESCLARECIDO - (TCLE)
(RESOLUÇÃO CNS Nº466/2012)

Prezado (a) Senhor (a),

Você está sendo convidado(a) a participar como voluntário(a) de minha pesquisa de Doutorado intitulada **"Justiça social e racial no contexto de imigrantes: possibilidades e desafios na educação matemática inclusiva"** que será desenvolvida por mim, **Manuella Heloisa de Souza Carrijo**, RG 4535682, pertencente ao programa de Pós Graduação em Educação Matemática da Universidade Estadual Paulista "Júlio de Mesquita Filho" - Instituto de Geociência e Ciências Exatas – Unesp – Rio Claro, sob a orientação do **Prof. Dr. Ole Skovsmose**.

O objetivo da referida pesquisa é elucidar possibilidades, pautadas em justiça social e racial, para aulas de matemática com estudantes imigrantes. Para tanto, procura compreender o contexto de famílias de imigrantes residentes no Estado de São Paulo.

A pesquisa acontecerá por meio de entrevistas realizadas pela pesquisadora, em que os participantes serão convidados a relatarem seus contextos de vida e fazerem reflexões relacionadas à temática da pesquisa. As entrevistas acontecerão de modo, individual e remoto (via google Meet), com roteiro de perguntas previamente elaborado. Algumas reportagens e charges sobre questões relacionadas à situação de imigração no Brasil e no mundo podem ser utilizadas como disparadoras de discussão. Essas ferramentas podem ajudar na reflexão sobre algumas das perguntas que serão realizadas. Os encontros ocorrerão em dia e horário a ser combinados com o participante da pesquisa e terá duração em torno de uma hora e meia. Caso haja algum problema técnico, como interrupção de conexão à internet, podemos retomar a entrevista em outro momento. Todas as informações obtidas a partir das conversas serão registradas em gravação de vídeo. Essa gravação é para registro das informações que irão constituir o material escrito de pesquisa. Nenhuma imagem sua será utilizada ou divulgada. Também, nenhuma informação será dada a outras pessoas que não façam parte da equipe de pesquisadores. Por ocasião da publicação dos resultados, o seu nome e de seus familiares serão mantidos em sigilo absoluto.

Ao aceitar esse convite sua participação será responder a um questionário prévio (será enviado antes da entrevista) para organização do momento da entrevista e conversar com a pesquisadora sobre: questões relacionadas a imigração no Brasil; situações em aulas de matemática com estudantes imigrantes; o que você pensa das interações entre estudantes imigrantes e estudantes nacionais; situações de racismo e xenofobia; o papel da matemática nesse contexto e outras questões relacionadas que podem surgir no decorrer da conversa.

Os benefícios da pesquisa são: 1) contribuir com o campo de pesquisa em educação matemática e educação inclusiva. Auxiliar na ampliação da compreensão do entendimento da relação entre inclusão

e educação matemática em contextos com pessoas imigrantes, objeto de pesquisa ainda pouco pesquisado. 2) contribuir com debates sobre o ensino e a aprendizagem de matemática no contexto de justiça social e racial com vistas a subsidiar debates de combate à desigualdade e injustiça social; 3) contribuir com a reflexão crítica dos participantes envolvidos.

Em relação a possíveis riscos ocasionados por sua participação na pesquisa, ressalto que todo cuidado será tomado para que sejam minimizados. Neste sentido, observo o seguinte:

1. Em caso de constrangimento e desconforto com a gravação em áudio e vídeo você poderá solicitar a interrupção da gravação e os registros poderão ser feitos por escrito, pela pesquisadora, em um diário de campo. Você também poderá optar por manter a câmera desligada durante a conversa e usar o chat para enviar comentários para a pesquisadora.
2. Em caso de constrangimento ou emoção ao abordar alguma questão da entrevista é importante que saiba que você não precisará dialogar e responder sobre todos os assuntos e questões feitas. A pesquisadora poderá reformular as perguntas ou pausar até que você se sinta em condições de retomar a entrevista. Você não será coagido a responder nenhuma pergunta caso não se sinta à vontade. A qualquer momento você poderá solicitar que a entrevista seja encerrada ou retomada em outra ocasião.
3. Em caso de timidez ou estranhamento ao encontrar a pesquisadora você poderá solicitar que a entrevista só inicie quando você se sentir à vontade para participar. A pesquisadora se coloca à disposição para esclarecimentos sobre eventuais dúvidas que possam surgir. Caso, após esclarecer suas possíveis dúvidas você ainda não se sentir à vontade, você poderá recusar sua participação.
4. Em caso de alguma interferência na sua rotina habitual você poderá ficar à vontade para interromper a entrevista a qualquer momento. Será tomado cuidado para que os encontros não sejam prolongados. A qualquer momento também, você poderá solicitar que a entrevista seja retomada em outra ocasião.

A participação é voluntária e sua recusa em participar não lhe provocará nenhum dano ou punição. Você poderá ter acesso ao roteiro de perguntas antes da realização. Você também poderá se recusar a participar ou retirar seu consentimento, em qualquer fase da pesquisa, sem penalização alguma. Para participar não terá nenhuma despesa, bem como nenhum tipo de remuneração. Você também terá acesso a transcrição da entrevista antes do início da análise pelo pesquisador

Se você se sente esclarecido(a) sobre a sua participação na pesquisa, sobre os objetivos e eventuais riscos e benefícios, convido-o(a) a assinar este Termo, elaborado em duas vias, sendo que uma ficará com você e a outra com a pesquisadora. Desse modo, você concorda que declara o seu consentimento em participar da pesquisa, como também concorda que os dados obtidos na investigação sejam utilizados para fins científicos (divulgação em eventos e publicações).

_____, _____ de _____ de 2021.

_____ _____
_____

Assinatura da Pesquisadora Responsável

Assinatura do Participante

Dados sobre a Pesquisa:

Título do Projeto: "Justiça social e racial no contexto de imigrantes: possibilidades e desafios na educação matemática inclusiva"

Pesquisador Responsável: Manuella Heloisa de Souza Carrijo

Instituição: Universidade Estadual Paulista "Júlio de Mesquita Filho" - Instituto de Geociência e Ciências Exatas/Unesp/Rio Claro

Endereço: Av. 24A, nº 1515 – Bela Vista – 13506-900 – Rio Claro/SP

Dados para Contato: Fone (62)98585-8674, (19) 3526-9391/ e-mail: manuellaheloisa@gmail.com

Dados do orientador:

Nome: Ole Skovsmose
Cargo/Função: Professor

Instituição: Universidade Estadual Paulista "Júlio de Mesquita Filho" - Instituto de Geociência e Ciências Exatas/Unesp/Rio Claro, Departamento de Educação Matemática.

Endereço: Av. 24A, nº 1515 – Bela Vista – 13506-900 – Rio Claro/SP

Dados para Contato: Fone (19) 3526-9391 / e-mail: osk@hum.aau.dk

Dados sobre o Participante da Pesquisa:

Nome:_____
_____

Documento de Identidade ou
CPF:_____

Sexo:_____Data de Nascimento:____/____/_____

Endereço:_____
_____

Telefone para
contato:_____

CEP-IB/UNESP-CRC

Av. 24A, nº 1515 – Bela Vista – 13506-900 – Rio Claro/SP

Telefone: (19) 35269678

Número do parecer: 42345220.5.0000.5465

Rubrica do pesquisador:_____ Rubrica do participante:_____

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Ao aceitar esse convite sua participação será responder a um questionário prévio para organização do momento da entrevista e conversar com a pesquisadora sobre: questões relacionadas a imigração no Brasil; o contexto da sua família; algumas situações em aulas de matemática; o que você pensa sobre as interações entre imigrantes e nativos; situações de racismo e xenofobia; o papel da matemática nesse contexto e outras questões relacionadas que podem surgir no decorrer da conversa.

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8. Em caso de alguma interferência na sua rotina habitual você poderá ficar à vontade para interromper a entrevista a qualquer momento. Será tomado cuidado para que os encontros não sejam prolongados. A qualquer momento também, você poderá solicitar que a entrevista seja retomada em outra ocasião.

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