COMMUNITARIAN MATHEMATICS EDUCATION:

Walking into boundaries

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Abstract

In this article, we outline some of the challenges involved in the construction of a communitarian mathematics education within the realms of the Urban Boundaries Project. The Urban Boundaries Project has been innovative in the way it congregates the critical development of basic needs of three distinct communities with an Ethnomathematics Posture (MESQUITA; RESTIVO; D'AMBROSIO, 2011), where concepts such as critical participation, ethnomathematics, violence, and urban boundaries, are discussed through political philosophy. This posture allows us to share the local history of the empowerment, autonomy, and wisdom of the three communities' situationality involved in the project, i.e., their knowledge of their political space. The local history is shared through the systematization of some content collected with critical ethnographical registration. To put it in Lacanian terms, we seek to symbolize a set of life-world experiences that have been historically neglected in mathematics education research, as well as in educational sciences more generally. As a result, this paper instigates the exploration of "disturbing" choices in the mathematical education culture.

Keywords: Mathematics Education, Communitarian Education, Urban Boundaries Ethnomathematics Posture, and Political Philosophy

EDUCAÇÃO MATEMÁTICA COMUNITÁRIA:

Caminhando nas fronteiras

Resumo

Neste artigo, descrevemos alguns dos desafios envolvidos na construção de uma Educação Matemática comunitária dentro dos domínios do Projeto Fronteiras Urbanas. Esse projeto tem sido inovador na medida em que congrega o desenvolvimento crítico das necessidades básicas de três comunidades distintas com uma Postura Etnomatemática (MESQUITA; RESTIVO; D'AMBROSIO, 2011), onde conceitos como: participação crítica, Etnomatemática, violência e fronteiras urbanas, são discutidos por meio da filosofia política. Essa postura nos permite compartilhar a história local do empoderamento, autonomia e sabedoria da situacionalidade de três comunidades participantes do projeto, ou seja, seus conhecimentos sobre seu espaço político. A história local é compartilhada por meio da sistematização de alguns conteúdos coletados com registros de uma etnografia crítica. Em termos lacanianos, nós buscamos simbolizar um conjunto de experiências do mundo da vida que têm sido historicamente negligenciadas na investigação em educação matemática, bem como nas ciências educacionais em geral. Como resultado, este artigo instiga a exploração de escolhas "perturbadoras" na cultura da Educação Matemática.

Palavras-Chave: Educação Matemática, Educação Comunitária, Fronteiras Urbanas, Postura Etnomatemática e Filosofia Política

PREAMBLE – THE URBAN BOUNDARIES PROJECT: HOW, WHY, FOR WHOM, AND FOR WHAT?

A group of researchers with different backgrounds together with two communities situated in Costa de Caparica, developed the Urban Boundaries Project (UBP) – funded by Fundação para a Ciência e a Tecnologia and hosted by the Institute of Education, University of Lisbon.

The UBP emerged as a result of a long process of socialisation between its principal researcher and two local communities of Costa de Caparica: *Bairro* (a slume established four generations ago gathering immigrants and portuguese[1]) and *Fishing* (a miscellany of fishermen, from north, south, and countryside of the country, using, among others, what is called in Portuguese *arte de xávega,* a hard and very intuitive fishing technique*).* The structure of the project had been collectively thought since 2002

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[1] We opted to write "portuguese" in minor letters in order not to make a distinction between those and gypsies, immigrants, etc.

by a movement of people (the Urban Boundaries Movement) sensible to injustice and humanity, though the project itself only started in 2012.

The daily work developed in the communities since 2002 allowed us to experience, discuss and rethink our ethnographical images and actions, and created the desire to construct a more systematic way of being together. The search for such systematisation was important since during the eight years that preceded the project we found a set of legal obstacles making it too difficult to establish an open and emancipatory collaboration. Our encounter – the encounter of these three communities –was not welcomed by the local authorities (town council, church and police). The destruction, by the local government, of a cultural centre built by the Urban Boundaries Movement as well as the constant raids that members of this group suffered by the local police are two of many examples.

Costa de Caparica is a coastal town, located in the south bank of the Tejo River, facing the capital Lisbon, and geographically limited by the ocean and the Fossil Cliffs rock face. Itis a dormitory town to the people who work in the capital and an important seaside resort, not only for worldwide tourists but for the Lisbon elite as well– who owns luxurious summerhouses and maintains its right to vote locally. Costa de Caparica is also a fishing town. Communities from across Portugal were developed by two distinct fishermen crews from Ílhavo and Olhão – located in the north and south of Portugal, respectively. The Fishing Community is besieged in the coastal zone of this town – known as *Costa*. Contrastingly, the rural zone located at the base of the Fossil Cliffs is known as *Terras da Costa*, and was developed by the agricultural community, being presently occupied, though not in its totality, by immigrant populations from other portuguese-speaking countries, gipsy communities, and portuguese migrants – they form the Bairro Community, central focus of this article.

Both the Fishing Community and the Bairro Community have been silenced by a minority of the population, which nonetheless forms a political majority. The encounter of these communities with another group – the community of academics– was depreciated both by local and municipal authorities. The establishment did not feel at ease with this union. Before the project, there had been several attempts from the ones in power to ruin any effort to develop a joint collaboration between the communities. As such, the Academic Community was seen as a strong link between the two local

communities who did not communicate before this encounter. This alliance fortified both communities, and aligned them towards a set of common goals.

At some point, we needed to develop a legal way to be together and academia was our option. This option was discussed and accepted by the members of the three communities, who saw the possibility of developing a funded project as a way to create a space of free interaction and common participation. In early 2010, we started to discuss some possibilities for being together, which involved the creation of an association, a cooperative, or even a NGO. However, since the majority of the people from the two local communities are considered non-eligible in legal terms, it would be difficult for them to be accepted as part of a broader organization. We decided that a funded project was a way out of this deadlock.

Consequently, we delineated what become the UBP, constructed from a search and a comprehension process regarding intra and intercultural dimensions. When drawing this three-handed project we realized the importance of clarifying the educational processes developed inside the local communities, the local necessities defined by their members, and the "symbolic" recognition of both communities by local society as a whole. All scientific tasks proposed in this project came from the needs of each of the communities. This is not a top-down project where a group of academics imposes its own research agenda to the community's members, but a truly bottom-up project where the voices of the three communities involved – Academic, Bairro and Fishing – encounter each other. We discussed lengthy our active role as part of the cultural diversity we represent and of the urban hegemony we are geographically included in. A process of valorization of local knowledge was set via the educational process of both local communities. This process was centered in local organization and local management of interactive and differentiated learning situations.

The development of the project is rooted in Paulo Freire's dialogical approach to critical participation (FREIRE, 1989). The *Curriculum Trivium* developed by Ubiratan D'Ambrosio (1999) was our main entrance to put in dialogical process our knowledge and place ourselves in an Ethnomathematics Posture (MESQUITA; RESTIVO; D'AMBROSIO, 2011). It gave us a way to reinforce the absolute participation during times of undeniable cultural encounters and confrontations experienced in Costa de Caparica, and to systematize (through the dialogical process) our surviving instruments

– intellectual and material artifacts. Concepts as value and ethics were determinant to such reinforcement. In the way we conceive it, this model of curriculum, based on *literacy*, *materacy*, and *technoracy*, can highlight the knowledge ongoing within local communities, and discuss eventual contradictions. Moreover, it has the potential to minimize local inequities and violations of human dignity, thus constituting a way towards social justice.

The main design of the UBP encompasses the educative strategies within the local multicultural communities. It intends to organize a set of parameters that can support an intercultural educational curriculum based in the socio-cultural and economic reality of these communities. Knowing the local educational challenges of these communities allowed us to sort out the invisibility cloak that hangs over them. First, the fishermen, prevented from participating in local public decisions. Second, the members of Bairro, living for more than 40 years without piped water. Finally, the researchers, involved in a struggle to create a space in the academia where other voices can be heard. Our "disturbing" choice in carrying out this project is aligned towards a positioning of research within the Political (PAIS; VALERO, 2012). We were inspired by Paulo Freire who rooted his work in the construction of a political conscience ableto struggle against the culture of silence (FREIRE, 1989).

In this article, we outline some of the challenges involved in the construction of a communitarian mathematics education within the realms of the project. Research in mathematics education has been criticized for leaving unaddressed crucial dimensions of what it means to be a learner and an educator, as well as its role in the political shaping of the world (GUTIÉRREZ, 2010; PAIS; VALERO, 2012). Researchers tend to neglect the *concrete world-life situations*(ŽIŽEK, 2012) of the ones involved in mathematics education, thus creating a fantasized reality where mundane problems such as hunger, legal persecutions, lack of material conditions, economic crisis, and others are not considered (VALERO, 2004; SKOVSMOSE, 2005). In this article, and through our experience with the two communities, we seek to bring these world-life situations into play, and conjecture what mathematics education will be like if it were to consider these situations. We take advantage of Slavoj Žižek's political philosophy in order to place education in the broader socio-political arena.

CREATING SPACES

A significant part of the project is dedicated to create the spaces in the academia where voices such as the ones of the people from these communities could be heard. This is different from "giving voice", usually understood as a valorisation of the Other's culture. "Giving voice" assumes that these people do not have a voice, thus being a position of domination (presented, of course, as a discourse of good intentions). Yet, these people already have a voice; the problem is that their voice is not heard.

The question then arises of how to create the spaces within mathematics education research so that these voices can be taken into consideration? This is by no means an easy task. Mathematics education as a field of research has been historically closed on the psychology of the child and mathematics. More recently, an emphasis in cultural, social and political issues has arisen, but these studies within the so-called social turn (LERMAN, 2000), although emphasising other issues besides psychology and mathematics, continue to privilege standard approaches to mathematics education (PAIS; VALERO, 2012). Even ethnomathematics, a field of study that in its beginnings was concerned with the development of a critique of mathematics itself, through a social, historical, political and economic analysis of mathematics and its education, has become predominantly focused on "local cultures" and non-scholarized forms of mathematics. This "local mathematical knowledge" is then used to improve the teaching and learning of mathematics in schools. In this perspective, ethnomathematics becomes another of the many "didactical tools" that abound in research. That is, it stops being a critical reflection on the sociopolitical roots of academic mathematics and the place it occupies in the popular imaginary and in schooling, to become a learning device. Such a development of ethnomathematics research is problematic and, in some instances, contradictory (PAIS, 2011; 2012b).

In the UBP we experienced some of these contradictions. While there is no doubt that both the Bairro and the Fishing communities, in their daily activities, use various forms of mathematical reasoning, they do so without any explicit reference to mathematics. It is the trained (in academic mathematics) gaze of the ethnomathematician that allows her or him to "see" mathematics in what people are doing. The problem with this approach is that it conveys the idea that a certain communitarian practice, like constructing a house or playing a game, becomes more

valuable if it is recognized as involving mathematics. It is mathematics that certifies the richness of what these people are doing and not the activity in itself. On the other hand, we soon noticed that during the process of critical alphabetization some members of the Bairro community showed interest in having mathematics classes so that they could succeed in formal education. They wanted to be educated in academic mathematics, because that is the one that would allow them to improve their lives. As such, a team from the Academic Community worked with them in formal mathematics, without any consideration from other mathematics that they may or not know.

Against this background, we acknowledge that the encounter between the local knowledge (aligned with diversity) and the academic (aligned with globalisation) is embedded in contradiction. We found support in the Freire's (1987) dialogical approach to education to deal with some of these contradictions. Our ethnomathematical posture allowed us to analyse the complexity and depth of our encounter and produced new instruments collectively developed. While invisible for the broader society, people from the communities became active and critical actors of their own practices. The ethnomathematics posture worked in the UBP was operationalized through the three main activities of the project: critical alphabetization, multiple cartography, and histories of life. The knowledge of the three communities came together through the development *in situ* of communicative, intellectual, and material instruments.

In the Urban Boundaries Project we avoid treating mathematics as a *sublime object of ideology* (ŽIŽEK, 1989). A sublime object is an object that seems to be missing where something is in discord[2]. Mathematics is often perceived as a powerful tool towards emancipation from an unjust world. As studied elsewhere (LUNDIN, 2012;PAIS, 2013), this ideology, although bursting with good intentions, ends up conveying the idea that more and better mathematics is the solution for problems that in their very nature are social, economic and political. As such, in the UBP research, we demystify the importance usually attributed to mathematics. Mathematics is no more than a tool that people use as part of a broader political struggle. It is the political

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[2]An important example of this object comes from mathematics. During the sixties, when Soviet Union launched the Sputnik and become the first country to put a satellite in the Space, the United States reacted by positing mathematics and its education as crucial features for surpassing such a crisis. Mathematics was perceived as what was missing in United States society to equal and surpass Soviet Union not just in the conquest of Space, but also in scientific, technological and economic terms.

struggle that needs to be highlighted, not mathematics. By bringing the voices of the two communities to the academia through the writing of articles such as this one, we aim to create spaces that both demystify the importance usually attributed to mathematics in terms of knowledge and competences, and posit its importance in terms of the value it has within capitalist schooling (BALDINO; CABRAL, 2006; PAIS, 2012a).

RURALITY IN TODAY'S EUROPE

The word "rural" is commonly used as opposed to "urban". While the latter refers to the life in the city, the former signals the countryside and more pre-modern ways of existence. In the last decades however, the increasing urbanisation of the geographical tissue has been creating spaces of rurality within the urban. That is, there is among huge urban settlements spaces where people live a relation to the land that is characteristic of the rural. The Bairro, in particular, is one of these places, where people live in a rural area, notwithstanding being in the middle of one of the most urbanised areas in Portugal.

In itself, there is nothing wrong with these rural spaces within the urban, given that people choose to be there and have all the facilities needed for a life with dignity. This is not the case with the Bairro community. Although they live in what we can call a "rural" place, they lack most of the conditions necessary to develop a rural life (water, permission to cultivate the land, to construct houses, warehouses, etc.). On the other hand, and more important, they are in-between urbanity and rurality, a kind of *hybrid rurality* where they have access to most of the superfluous goods of urbanity (cable TV, mobile phones, cars, etc.) but lack the most essential ones (water, sewage system, etc.). It is as if these communities live in a high-tech third world.

This phenomenon – the increasing amount of people living amidst Europe in third world conditions – is becoming a constant of postmodern societies. The economic crisis that has been overriding Europe for the last five years, together with an escalade of illegal immigration, has only made it worse and more visible. Europe's excluded rabble often comprises communities of illegal immigrants, slum-dwellers or refugees,

but can also be constituted by european [3] citizens living situations of chronic unemployment, addictions, homelessness or even workers of undervalued or unrecognized works. These are groups of people for whom there is no place within the organised totality of the European Union, although they formally belong to it. They are the "part of no-part" (RANCIÈRE, 1995) of the European social body.

Žižek (1994) distinguishes between human beings that are IN (included in the legally regulated welfare society and human rights), and those who are OUT (lacking basic survival instruments and a life with dignity). However, to be part, even of a non-part, is necessary to be in, topologically speaking. In that sense, it is undeniable the existence of a space where the social relations between the visible and the invisible are present; a space mainly characterized by the presence of the cultural groups materially and intellectually marginalized − a non-space (MESQUITA; RESTIVO; D'AMBROSIO, 2011). These groups of excluded people are sometimes seen by the political doxa as a contingent problem likely to be solved through the efforts of public programs of rehabilitation or private charity. More often, they are simply ignored and confined to invisibility. More dangerously, however, they tend to be seen as a threat to social order and stability, against which severe measures ought to be taken. In all cases, Europe's rabble is often perceived as being extrinsic to the European project.

In the rural area, the process of conurbation [4] occurs not only by physical movement but also by the hybridization previously described. Non-spaces are characterized by entropy (the measure of the social disorder) and the anomie (the lack of the social order) of social relations (DURKHEIM, 1897). In a non-space, the physical space is not recognized, notwithstanding the existence of social relations. This non-recognition may turn into fear by those who see without seeing. However, the fear of the invisible Other does not derives from any intrinsic malefic characteristics of this Other, but it is a result of the frightened gaze of the ones who are IN (ŽIZEK, 1994).

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[3] We opted to write "european" in minor letters for the reasons previously explained.

[4] Geographically speaking, conurbation denotes the region where different towns expand and form one single urban area. According to social geographers, this is moved by the socio-economic needs of the different populations who seek to reduce distances and promote new possibilities. In cultural or social anthropology, this concept is used to explain important aspects of human behaviour. In both cases, the word conurbation denotes both a movement and a process. For us, this term signals a process of circumcision where the merging of different populations creates topological disjunction and explicit boundaries (which, nonetheless, may remain invisible).

The field of the UBP taught us not to let the process of conurbation, and the hybridization, go unnoticed even if they were a camouflage to keep, or even spread, the non-spaces. These processes are not allocated in a specific geographical position but can be found around the world. They are intrinsic to the economic crisis and the struggle for survival. The UBP acts in non-spaces through collective discussion between the three communities. These discussions concern the different forces involved in the constitution of these non-spaces.[5]

THE KNOWLEDGE OF THE OTHER'S KNOWLEDGE

The recognition and validation of knowledge is determined by the necessity of maintaining the economic machine well-oiled and functional. Žižek talks about "the shattering impact of modernity – that is, capitalism combined with the hegemony of scientific discourse" (2008, p.90) to express the historical alliance of science with capitalism. Because of this alliance, knowledge is valorized as long as it suits the demands of the market. For instance, in South Africa, a whole knowledge industry is developing around the idea of Indigenous Knowledge Systems (IKS)[6], of which ethnomathematics is one component. Knowledge is valorised as long as it is aligned with the needs of capitalist economics[7], or as long as it does not present any really threat to it. In our current multicultural society, it is normal to recognize other knowledge, but such recognition only fortifies the myth of "participation", while at the same time guarantees that no fundamental change either in scientific research or in society occurs.

This incorporation of ethnomathematical ideas into capitalist dynamics is made possible through the deployment of an ideological injunction where we are willing to accept the Other deprived of its otherness (ŽIŽEK, 1992). That is, we are willing to accept the Other as long as it fits into our symbolic order[8] as long as it is kept at a safe

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[5] A non-space is created by all of us who watch without seeing. The habitants of Costa de Caparica, for instance, see the Bairro – it is located at the end of the highway that leads to town – but their existence is not noticed, thus repressed.

[6] A program organized by the Department of Rural Development and Land Reform of South Africa, which aims, among other things, to patent and commercialize IKS products.

[7] As proved by the recent emphasis on evidence-based research overriding academia.

[8] We are referring to what Jacques Lacan (2000) called the Symbolic: the intersubjective symbolic network that structures our sense of reality.

distance, the distance that prevents us from reaching its non-symbolic dimension. I love the Other (the poor, the indigenous) precisely because he is poor, oppressed, and utterly helpless, needing protective care. Žižek puts this way:

> It is easy to love the idealized figure of a poor, helpless neighbour, the starving African or Indian, for example; in other words, it is easy to love one's neighbour as long as he stays far enough from us, as long as there is a proper distance separating us. The problem arises at the moment when he comes too near us, when we start to feel his suffocating proximity—at this moment when the neighbour exposes himself to us too much, love can suddenly turn into hatred. (1992, p. 9).

When we claim that we must "give voice" to the oppressed (poor students, ethnic students, minorities, and so on), we always take the risk, behind the appearance of a legitimate will for valorising the voices of oppressed people, of stipulating how this voice should be, by positing the Other in our symbolic order, constructing him as innocent, in need of help, oppressed people who are seen as victims of our consumerist and racist society. They have voice as long as their voice is the voice of the oppressed, the voice asking for help, the voice we expect to hear. When the poor student admits that he just wants to be rich, or the "ethnic" student says that he only wants to learn the mathematics of the white people, we feel deceived, because we encounter the real Other. It is as if there was an underlying desire to keep someone in the status of a victim, so that we can enact in ourselves the desire for helping: "the saintly person uses the suffering of others to bring about his own narcissistic satisfaction in helping those in distress" (ŽIŽEK, 1997, p. 101). This "saintly" spirit, in all similar to the one of charity and philanthropy, completely endorses the spirit of capitalism. It allows people to ease their consciousness, while at the same time assures that no fundamental change in schools or in the economical organization of society occurs.

To know the knowledge of the invisible Other is a tool of the post-modernist to promote the corporification[9] (MESQUITA, 2008) by not being responsible for his or her acts, making unusable his or her strategies, and "accepting them" in a process of multicultural racism (ŽIŽEK, 2008). Instead of recognizing the local knowledge in itself, the increasing pressure of the market uses it as part of its machinery. As a result,

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[9] Corporification acts by means of power, mechanisms, techniques, norms, rules, and discourses that position us in order to become knowledgeable and capable of being administered.

rural populations are weakened (becoming smallholders for the outsourcing movement), and become docile (for instance by becoming privileged hosts for the ethnic-touristic industry), or even hick (increasing the invisible group).

The constitution and the development of the UBP have maintained the transcommunitarian[10] "sense of crisis" of the modernity, which, according to Žižek (2008), disintegrates the link, or even the identity, between true and sense. The truth, argued by this author, is not "objective" truth but the self-relating truth, which he affirms is directly linked with the way how our   in symbolic identifications. Our experience in the UBP has been an outline of the disruptive impact of our times, breaking the hegemonic and addicted scientific discourse.

FRAMING A COMMUNITARIAN MATHEMATICS EDUCATION

At this point, the reader may interrogate us about the mathematical specificity of this article: where is the mathematics or what has any of this to do with mathematics education? We apologise if we do not give an expected account of the particular mathematical details worked with the communities. We prefer instead to highlight the educational dimension involved in "mathematics education". This is because our struggle is not towards the improvement of the process of teaching and learning mathematics. We could not care less about such improvement when it is framed within capitalist education. Our struggle is more ambitious, and is targeted at broader structural arrangements of which mathematics is only one component. We seek for radical emancipation in the sense attributed to it by Žižek (2012). We have always in mind the bigger picture of what our struggle is, and we act through our local engagements. By communitarian education we understand the process where different communities come together and establish a set of political commons. As Freire (1989) used to say, education is politics, and it should not be reduced to a pedagogical or didactical hindrance.

Our collective exercise of establishing a set of political commons in the Urban Boundaries Movement allowed a collective consciousness of local needs. The local

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[10]An act or fact is transcommunitarian when it arises from events that are based on the existence, survival, and life— beyond social, cultural, historical, and geographical events.

needs, defined by the communities, are voice (can speak and be heard) to the Fishing Community, water to the residents of the Bairro Community, and emancipatory education to the academics. These different needs are aligned around a set of common values, which are not always easy to explain. The Fishing Community, overwhelmed (for many years) by the fishing industry and, nowadays, locally smothered by a politics of forgetfulness and prohibitions, firms its needs from years of silence and subjugation. The histories of life of fishermen and contacts with new forms of organization became their marks in the UBP. The Bairro Community[11], under its illegality, is a rural place where water is available for land planting but not for people. This community has almost 500 members and began 4 generations ago. The local and diverse cartography and the critical alphabetization became their marks in the UBP. The Academic Community, embedded on the ethnomathematics posture, found in the communitarian education developed by these both communities – Fishing and Bairro – a way to understand the possibilities of an emancipatory education. The local academics, with different backgrounds and similar objectives, worked under an intensive critical ethnography that allowed not only living with these communities but also to work and disseminate their needs – not for them but with them. The dissemination of our encounters and the dialogical process became our marks in the UBP.

The understanding of the process in which these three different communities come together made us recognize and valorize each other. We are aware that the process of valorization can be embedded in a false will for recognition, as when we are willing to accept the foreign other but deprived of its substance (as previously described). However, the process of valorization of the local knowledge in the encounter of these three communities was developed by sharing our knowledge in the construction of our understanding as group and as community (intra and inter community), and in the construction of our intentions.

By doing so, we demystify the Other both as "dangerous" and as "innocent". Indeed, in itself a non-space in neither "good" nor "bad". The UBP has taught us that non-spaces are not the idyllic spaces of diversity and possibility that something appears

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[11] The Bairro Community is an example of how some ideas are reified in the broader society, especially by the idea that human beings are recognized by the properties they have. These properties go from material things to intellectual things. The quantity of properties has a great value in our capitalist system, since they become the measure of what we are.

in multicultural research. As previously argued, people living in non-space communities are sometimes more like the ones who are IN than we can expect. They can be passive and aligned with the same system that oppresses them. For instance, the non-spaces can be important places for local and national economy. Many of the people who live in Bairro are doing low-waged jobs necessary for the health of the middle-class. They also consume all the superfluous goods that make the capitalist system thrive. Furthermore, they have been the focus of NGOs and charity institutions that uses them as a source of income; they need to be maintained where and how they are in order to produce surplus value for the local and national economy. They can also perform many activities that can be seen as non-ethical by the dominant class (illegal fishing, drug dealing, etc.). We do not want to sanitize these communities but take them as they are and work from there. It is emergent to accept the hybrid phenomena and the process of conurbation as a tool to promote a participative and critical research and, through it, participative and critical approaches. As such, the ethnomathematics posture claimed here goes against the idea of mathematics as the solution for the world's problems and against the idolatry of the difference. It is important to be with the Other, and, through a dialogical process, knowing each other (and sharing our knowledge).Only from there it is possible to act and develop strategies aligned with our common goals.

OUTSIDER INSIDER PERSPECTIVE, BY KAREN FRANÇOIS

The research within the UBP is anchored in the research field of philosophy of mathematics education, more precisely in the field of the external philosophy[12] of mathematics (education), which is concerned with the study of how mathematics (education) is embedded in a social, historical, cultural, and political environment of power.

The most critical point of this research project concerns the question of the status of mathematics itself. From the point of view of the external philosophy of mathematics, the critical question concerns the positioning of mathematics as the central motor not only for the invention and the development of modern science (most explicit with the philosophy of Descartes who is proclaiming a *Mathesis Universalis*) but also as

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[12]Instead of the internal philosophy of mathematics which consists of the study of the foundations of mathematics, the foundational crisis and the search for a robust (abstract, western) mathematics.

the machinery of the interconnected project of modern science, technology and capitalist economy.

Although this critic is not new, it opens new perspectives in the field of mathematics education. The concept of mathematics education can no longer be defined and implemented by 'his master's voice' [13]. The concept and the aim of being mathematically literate need to be negotiated in a context where all voices of the collective have to be heard. The article has made clear that all actants have their voices although some of them, or most of them, are silenced by a minority of the population, which, as Mônica and Alexandre mention, nonetheless constitute a political majority. The aim of the academics involved in the project is not 'to give voice' but rather to make noise by deconstructing 'his masters voice'. From the perspective of an external philosophy of mathematics, the UBP is a most interesting case because of the very hybrid nature of the research project itself. In a research context, the concept of 'hybrid' is connoted with the concepts of 'immature', 'imperfect', maybe 'defective', and thus negatively valued. We would like to use the concept of hybrid as an opportunity toopening and broadening the horizons in which mathematics education is discussed by the academics. To speak in terms of Bruno Latour, hybrids are unexplained and unexplainable by the modern constitution. Therefore, they are erroneously called premodern. They are the collectives that characterize our society. The notion of the 'collective' becomes central in Latour's (2005) Actor Network Theory (ANT) (François, 2013). The UBP is an example par excellence of a hybrid collective where many entities or *actants* come together in one community to satisfy their diverse aims. In the frame of this article, we focussed on the topic of mathematics education and the concept of mathematical literacy as one of the possible aims of the UBP alliance. One thing the article has made clear is the fact that the discussion on mathematical education and literacy in rural areas takes place in a complex network or collective. Therefore, it has to be studied from different points of views or from 'different speakers' corners' to refer to the concept of 'voices'. The discussion is 'situated' in a complex network, so

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[13]"His Master's voice" is used as a metaphor for the discourse of hegemony as defined by Laclau and Mouffe (1985), which can be the discourse of an individual, a spoken discourse, a written discourse or it can be the discourse of an institution, an ideal object, an ideal collective. The discourse of hegemony is characterized by a relation of power and potentially by oppression.

are the different voices who aim to speak on behalf of the different actants within the collective. The inside outside perspective takes part at the richness of the conglomerate of diverse situated knowledges. Especially the *situatedness* of the 'strangers' becomes in the UBP a condition *sine qua non* for the construction of what Haraway (1991) calls 'embodied' objectivity. The way how the concept of 'rural mathematics' (and mathematics education in general) has to be studied is not from "the standpoint of the master, the Man, the God, whose Eye produces, appropriates, and orders all differences" (HARAWAY, 1991, p.193). The way mathematics education can be studied and negotiated, as showed in this article, is from a situated point of view emphasising the way knowledge is always situated and structured by privileged positions such as inside outside, gender, nation, legal position, citizen position and class. It is this situated knowledge that is the only possible way to negotiate the aims of the collective and eventually to engage in a mathematics learning process. This is what we can call a communitarian mathematics education.

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REFERENCES

BALDINO, R.; CABRAL, T. Inclusion and diversity from Hegel-Lacan point of view: Do we desire our desire for change. **International Journal of Science and Mathematics Education**, v.4, n. 1, p. 19–43, 2006.

D'AMBROSIO, U. **Educação para uma sociedade em transição**. São Paulo: Papirus, 1999.

DURKHEIM, E. **Le Suicide**: étude et sociologie. Paris: Félix Alcan, 1897.

FRANCOIS, K. Pro-Latour. **Foundations of Science**, v. 18, n. 2, p.337-342, 2013.

FREIRE, P. **Pedagogia do Oprimido**. 28. ed. Rio de Janeiro: Paz e Terra, 1987.

FREIRE, P. Educação como prática da liberdade. 19. ed. Rio de Janeiro: Paz e Terra, 1989.

GUTIÉRREZ, R. The sociopolitical turn in mathematics education. **Journal for Research in Mathematics Education**, v. 41, p.1-32, 2010. DOI:10.1007/s10699-011-9267-2

HARAWAY, D. J. Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective. In: HARAWAY, D.J. **Simians, Cyborgs, and Women**: The Reinvention of Nature.London: Free Association, 1991, p. 183–201.

LACAN, J. **The psychoses: The seminar of Jacques Lacan: Book III**. UK: Routledge. 2000

LACLAU, E.; MOUFFE, C. **Hegemony and Socialist Strategy**: Towards a Radical Democratic Politics. London: Verso, 1985.

LATOUR, B. **Reassembling the social**: An introduction to actor-network-theory. Oxford: Oxford University, 2005.

LERMAN, S. The social turn in mathematics education research. In: BOALER, J. (Ed.).**Multiple perspectives on mathematics teaching and learning**. Westport: Ablex, 2000, p. 19-44.

LUNDIN, S. Hating school, loving mathematics: On the ideological function of critique and reform in mathematics education. **Educational Studies in Mathematics**, v.80, n. 1, p. 73-85, 2012.

MESQUITA, M. **Children, Space, and the Urban Street: An Ethnomathematics Posture**. Thesis (PhD in in Educational Sciences) Faculdade de Ciências e Tecnologia, Universidade Nova de Lisboa, Lisboa, 2008. Available at: <http://run.unl.pt/handle/10362/2301>.

MESQUITA, M.; RESTIVO, S.; D'AMBROSIO, U. **Asphalt Children and City Streets** – A Life, a City, and a Case Study of History, Culture, and Ethnomathematics in São Paulo. Rotterdam: Sense Publishers, 2011.

PAIS, A. Criticisms and contradictions of ethnomathematics. **Educational Studies in Mathematics**, v. 76, n. 2, p. 209–230, 2011.

PAIS, A. A critical approach to equity in mathematics education. In: SKOVSMOSE, O; GREER, B. (Ed.). **Opening the Cage**: Critique and Politics of Mathematics Education. Rotterdam: Sense, 2012a, p. 49-92.

PAIS, A. A investigação em etnomatemática e os limites da cultura. **Reflexão e Ação**, v. 20, n. 2, p. 32-48, 2012b.

PAIS, A. An ideology critique of the use-value of mathematics. **Educational Studies in Mathematics**, v. 84, n. 1, p. 15-34, 2013. DOI 10.1007/s10649-013-9484-4.

PAIS, A.; VALERO, P. Researching research: Mathematics education in the political. **Educational Studies in Mathematics**, v. 80, n. 1-2, p. 9-24, 2012.

RANCIÈRE, J. **Disagreement**: Politics and Philosophy. Trans. Julie Rose. Minneapolis: University of Minnesota, 1995.

SKOVSMOSE, O. Foregrounds and politics of learning obstacles. **For the Learning of Mathematics**, v. 25, n. 1, p. 4–10, 2005.

VALERO, P. Socio-political perspectives on mathematics education. In: VALERO, P.;ZEVENBERGEN, R. (Ed.). **Researching the socio-political dimensions of mathematics education**: Issues of power in theory and methodology, Boston: Kluwer, 2004, p. 5-24.

ŽIŽEK, S. **The sublime object of ideology**. London: Verso, 1989.

ŽIŽEK, S. **Enjoy your symptom!** Jacques Lacan in Hollywood and out. London: Routledge, 1992.

ŽIŽEK, S. **The Metastases of Enjoyment**: Six Essays on Women and Causality. London: Verso Press, 1994.

ŽIŽEK, S. **The plague of fantasies**. London: Verso, 1997.

ŽIŽEK, S. **Violence**: Six sideways reflections. New York: Picador, 2008.

ŽIŽEK, S. **Less than nothing**. London: Verso, 2012