# Chapter 5
# Once Upon a Time… The Gypsy Boy Turned 15 While Still in the First Grade

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*I understand access and participation as Social Justice.*
—D'Ambrosio (2012)

**Abstract** The need to develop a bottom up curriculum for Roma students (preschool education) in order to support their learning at school—language and mathematics—and with a view to contribute to their social inclusion through an ethnomathematical perspective led us to conduct fieldwork on the Roma students' community of origin. The ethnomathematical perspective supported the combination of a critical ethnographical fieldwork using critical communicative methodology (CCM) for exploring students' funds of knowledge as well as the parameters that affect Roma children's education. Poststructural ideas such as power/power relations contributed to understanding how inequalities are constructed through discursive practices, making the inclusion of Roma (and other marginalized groups) merely rhetorical. The pragmatological material, discourse, discursive practices, practices, representations etc.; derived from the community informed both our practices/our interventions in the kindergarten, and our future actions in the community aiming to respond in social justice issues, important for both Roma and non Roma communities.

**Keywords** Ethnomathematics · Roma children education · Critical ethnography · Sociopolitical turn · Poststructural

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## 5.1 Introduction

Five years ago, because of my ethnomathematician's background, I was invited to contribute to a longitudinal project on Roma children's education during the period of 2011–15, addressing all educational levels. Together with a linguistic colleague, the project concerned preschool education, meeting the design and implementation of educational practices that would allow for students' involvement in classroom communication, and for the broadening of their communicative repertoire through the use of Greek language and mathematical literacy practices.

(Mathematics) education and particularly mathematics learning in classroom contexts, is not a simple task for such populations, depending on cultural, social and political aspects that are strongly involved. Aware of this, our decisions were supported theoretically by research on the sociocultural and mostly sociopolitical field, including in these ethnomathematics that recognize the complexity of (mathematics) education. We began with a critique of approaches that ignore crucial dimensions of learners and educators, and of real-life situations that involve or/and affect, explicitly or implicitly, the procedures of Mathematics education (Gutiérrez 2013; Pais and Valero 2012; Mesquita et al. 2014).

Despite the long-term recognition in mathematics education of the need to develop models of mathematics education that address the diversity of populations that they serve (Brown 2010), there persists a need to go beyond mere depiction of the cultural conflicts and their impacts toward explicit responses. We sought potential transformation of situations involving inequality and exclusion through processes of data collection and our critical ethnography on the Roma community through the theoretical lens of Critical Communicative Methodology (Gómez et al. 2011).

This chapter is organized as follows: first, we present: (a) briefly, the situation of Roma education in Greece together with the role of preschool education; this is followed by, (b) our theoretical and methodological perspectives; (c) our findings from the fieldwork in the community; (d) some interventions in Kindergarten classes with Roma students; and (e) a closing discussion.

## 5.2 Roma Children's Education: Preschool Education

Despite the rhetoric of the formal curriculum about equality and inclusion, Roma children face serious conflicts when they are required to participate in a formal school setting. For example they have to deal with boundary identities, bilingualism (Gana et al. 2016), and the lack of efforts to exploit their informal knowledge. What we find is a setting characterized by serious cultural and cognitive conflicts that makes their schooling process an acculturation process.[1]

[1]See Bishop (1988, 2002).

The *top-down* curriculum adopted by common teaching practices, together with the ignorance of the mathematics knowledge children acquire through their involvement in their family professional activities (Stathopoulou 2005), seem to further marginalize these children and their families, constructing them as occupying inferior positions in terms of both learning and cultural identities.

My main contribution to this project was my extensive prior experience working with Roman communities, an ethnomathematical study I previously conducted in order to explore how the cultural context of Roma children is related to mathematics teaching/learning (Stathopoulou 2005). I brought the findings from this previous research, along with my understanding of the Roma community and my personal relationships with several individuals in the community with whom I had worked in that previous study, to the specific focus on Roma children's preschool education, and to my official responsibility for the mathematics education components of the curriculum.

The research *on the spot* was conducted both in a first grade class of Roma students[2] and in the community of origin of these students. This particular community, it should be noted, more or less reflects the greater Roma community, and anyway is similar with the community of reference in this paper[3] as it is documented by the fact that people of the two communities were relatives. The fieldwork pointed out how their schooling process and particularly mathematics learning is affected directly or indirectly by the cultural peculiarities of the community.

The main characteristics related to Roma children's education in general, and particularly mathematics learning, were (Stathopoulou and Kalabasis 2007):

- *Semi-nomadic way of life*. There are obvious consequences of this characteristic for formal schooling; for example, it often results in a delayed start to schooling, and creates an inconsistent attendance.
- *Socio-economic organization.* Businesses are usually organized within the framework of the family group. As a result, children are involved in their families' activities.
- *Language orality.* Roma have only oral language; the orality of language has as a consequence students to memorize lot of information, like a list of shopping or easiness to make mental calculations, while the negative aspect of this cultural element is the fact that Roma children have no previous experience of written texts.
- *A different perception of education.* Formal education is not an activity, yet, integrated into Roma culture in the way it is in the broaden society. However, despite it is appeared that Roma people dispute the need for formal education the reality is more complicated and many questions are emerged. Is this

[2]Despite, the official rhetoric at the school where I conducted the research there were two classes purely of Roma children, constituted by children from 7 to 12 years old.

[3]Our project included all Thessaly area, a big part of all Greece. The communities we were working with are characterizing by diversity about the broaden society, among them and inside them.

education designed to include them? Is it adaptable to their needs? Have they the information of what is education really? Could help them in a direct way to respond to their problems' problems of surviving? If they need to travel all around the country how could they leave their children at home alone? So what it is attributed to the luck of interest why it is not luck of the state to be adaptable to their needs; needs for surviving?

An important conclusion through my research at this time has to do with the relative strength of the knowledge students acquire through their involvement in family activity. I therefore argue that it would be far more effective to bridge this informal knowledge with the formal school knowledge, instead of ignoring or disputing this knowledge, as often transpires in their school experience. The choice to bridge such knowledge in the case of my research, which, in this project, also involved teaching, resulted in a class with students' voices present –a classroom of participation (Stathopoulou 2005). Such instructional practice is not a common in a typical mathematics classroom where teachers follow textbooks and curriculum designed for the mainstream student.

My own experience in the Roma project is consistent with findings from other recent research. Papachristou (2014) focused on teachers' conceptions about Roma students' formal education. This study found that teachers: (a) do not recognize background knowledge of Roma students; (b) do not exploit Roma students' language orality during teaching processes; and (c) maintain stereotypical perceptions on the school process of Roma students and their potential. Additionally, recent reports from UNESCO (2014) highlight the fact of Roma students' inadequate attendance and high dropout rates in comparison with other sub-populations in their schools; despite recent improvements from the past, they are still high.

Among the other conclusions from my fieldwork at this time emerged the crucial role of Preschool education: the two children that had attended kindergarten programs were familiarized with the norms and practices of formal education, facilitating their adaptation to classroom culture and school learning processes. In addition, through several researches the role of preschool education is underlined, since preschool experiences contribute to building necessary knowledge and skills for the successful transition to, and subsequent attendance in, elementary school. Preschool education as an educational stage, appears to be especially crucial for students with minority cultural or even language origin, for whom it provides supports in overcoming numerous learning obstacles related to their sociocultural background; preschool education thus contributes conditions that ensure equal educational opportunities for all (Becker and Tremel 2011; Gana et al. 2016).

Although discussion about the role of preschool education in ensuring equal educational opportunities for children from immigrant families, ethnic minorities, and socially marginalized groups is not new, it has recently increased more rapidly due to interest in PISA findings and their potential correlations with possible school failure that children from the above-mentioned groups face. Research has emphasized the importance of the timing for addressing knowledge deficits, specifically deficits in the language of instruction (Fuchs-Rechlin and Bergmann 2014), and

connections to the creation of conditions that ensure equal educational opportunities for all (Gogolin 2009; Becker and Tremel 2011): the duration of school attendance and the quality of educational practices are included as main parameters that improve learning outcomes (Hasselhorn and Kuger 2014).

Despite the fact that the literature highlights the positive role of preschool education, and the gradual accrual of insights regarding qualitative characteristics of pedagogies that ensure benefits of school attendance for students with multicultural and lingual diversity, Roma students do not yet appear to benefit from such research findings. A recent comparative study (UNESCO 2014) on the educational situation of Roma children in European countries states that the number of students attending compulsory education in European countries is still too low. Further research maintains that Roma children arrive at school without adequate preparation, and with little understanding in the majority language.

Top-down educational policies addressed to the mainstream students, combined with the ways that teachers interpret and materialize those policies in contexts including Roma students, appear to significantly account for diminished school attendance of Roma children. Relevant considerations have been described with regard to the Greek educational reality, as well. The Greek educational system, like most educational systems in European countries (Govaris 2005), is not yet in a position to effectively respond to a school reality characterized by linguistic and cultural diversity. The applied pedagogies formulate a field of unequal distribution of opportunities for recognizing and exploiting the learning resources included in the linguistic and cultural capital of a diverse student body.

In fact, Greek school practices tend to be guided by an assimilationist ideology that seem to ignore or understate fundamental characteristics of children's cultural identities. "Their" culture is usually assessed as insubstantial and worthless, and most teachers presume that non-Greek home languages do not contribute, or even stand as an obstacle, to their school performance; teachers are furthermore unlikely to use the home language as a resource. In such an educational context, Roma children's erratic school attendance and their dropout rate, which is among the highest in the country, could be strongly linked to the silence, marginalization and underestimation of their world that Roma children experience in classrooms (Noula et al. 2015).

## 5.3 Conceptual/Theoretical Perspectives

For a long time, research in mathematics education was based on psychological approaches that appear insufficient, since they could not respond effectively in mathematics learning mostly for students out of the main stream. In recent decades, the realization of the inadequacy of psychological perspectives, the failure of applying programs of modern mathematics all around the world and the consequences of globalization such as displacement of people (migrants, refugees, etc.), and the formation of multicultural societies with diverse educational needs moved

international research to broaden its view, including approaches that explore social, cultural, and political dimensions as important for interpreting and responding to the above situation in mathematics education.

### 5.3.1 Sociocultural and Sociopolitical Turn in Mathematics Education

In 2000, Lerman inserted the term 'sociocultural turn' to describe this trend in research. In his work he includes a corpus of studies that challenge previous perceptions about mathematics knowledge and mathematics learning, and which document the term he inserted. He included Jean Lave's work (Cognition in Practice 1988) as an example of challenging cognitivism and transfer theory in mathematics learning. The research of Carraher (1988) on School and Street mathematics is another example that challenged the role of the context in problem solving. The book of Bishop (1988) entitled *Mathematics Enculturation: A Cultural Perspective of Mathematics Education* was mentioned by Lerman for its cross-cultural view of mathematical practices, and the critical exploration of the assumed universality of mathematical activities, showing how these depend on cultural context.

Two other contributions of this time that are of great interest for us is this of Valerie Walkerdine and of Ubiratan D'Ambrosio. Walkerdine, in The Mastery of Reason (1988) located through a Foucauldian analysis meanings in practice, and wrote about the construction of identities as discursive practices, bringing to the scene issues of power/power relations. And, finally, the ethnomathematical approach, a term introduced by D'Ambrosio at the 5th ICME in Adelaide, (D'Ambrosio 1985), was included by Lerman (2000) as a new direction of research "that played a large part in creating an environment that was receptive to the social turn" (p. 9). Also, Lerman, in this work, makes two additional important observations: He furthermore speaks about the influence of Vygotsky' work explicitly or implicitly in the research at this time; and he discusses the influence of other scientific fields: Anthropology, sociology, and cultural phycology.

Although the political dimension is detected in the research reviewed by Lerman, a few years later, Gutiérrez (2013) used the term *sociopolitical turn* in mathematics education to mark the movement beyond a sociocultural view toward the exploration of sociopolitical concepts and theories, highlighting identity and power, by researchers that focus on anti-racism and social justice issues (Gutiérrez 2013). She questioned about the late development of the research fields that led to this turn (sociopolitical turn):

> Ethnomathematics, which seeks to decenter Western mathematics and highlight the mathematical practices of people throughout the world, was created in the 1980s; critical and social justice mathematics has flourished just in the last 2 decades; critical race theory, LatCrit theory, and science and technology studies only gained momentum in the mid-1990s, and post-structuralism and postmodernism have been embraced in mathematics education only recently (Gutiérrez 2013, p. 43).

Gutiérrez supports acknowledging the contribution of sociocultural perspectives to challenging notions of *learning* and *participation*, and makes clear that adopting sociopolitical perspectives is a challenge to rethink terms such as *mathematics, who is good in mathematics*, *the role of resistance in relation to dominant circles*, and *quality teachers*. The process of deconstruction is particularly useful to expose current practices/knowledge/categories as socially constructed in a particular point in history. This approach opens up new possibilities, new views on learners and educators, and new arrangements within/beyond school upon which we can act. Highlighting gains from a sociopolitical posture, she includes as very important: moving *Beyond Essentialization and Victimization, Challenges of Common Notions, of Teacher Quality of Racial Hierarchy and of (School) Mathematics*.

Gutiérrez (2013) emphasizes in her work the important contribution of post-structuralism to the sociopolitical turn, noticing that post-structuralism offers additional theoretical tools for those who have adopted a sociopolitical stance. In this framework mathematics education, learners, teachers, and researchers are considered both results and producers of discourses. Discourse is not considered as individual, static, or referring only to language but involves other symbolic expressions, objects, and communities (Moschkovich 2007). Because discourses are inherently social, political, historical, and connected with the construction of meaning, these approaches share much with those ways of thinking about mathematics education that are connected to a concern with culture, considering culture not a stabile entity.

Meaning, reasoning, knowledge, action, learning, and so on, are products of discourses and discursive practices, constantly renegotiated in social and cultural contexts, finding their meaning in the outcomes of actions and interactions moment by moment (Appelbaum 2008; Walshaw 2007). In other words, meanings that people make of themselves and their world are constantly being created in and through interactions with others, in larger social and political contexts, with discourses that are themselves renewed and modified through these experiences and events (Appelbaum and Stathopoulou 2016). In the Foucauldian approach, knowledge is an effect of a primarily linguistic discursive formation, that is, a set of fundamental rules that define the discursive space in which the subject exists (Freitas and Walshaw 2016). Very often discourses do not represent the reality but construct it.

Gutiérrez (2013) uses as an example of reality's construction the achievement gap in U.S. mathematics education that it is presented and been conceived as an absolute truth. The importance of understanding discourses in this way is that they produce *truths*. In her framework, she also questions the notion of *success* that is largely driven by discourses of achievement and proficiency on standardized exams and tangible outcomes that can be measured in some way. In this context, a poststructuralist view is against singular meanings and challenges truths such that concepts like *success*, *proficiency*, *achievement gap*, and even *mathematics*. The way these notions are constructed are in line with what we think of as habits of successful learners or practitioners (a form of internal surveillance) (Foucault 1977).

Our definitions of success rarely include self-actualization, that is, the idea that we should be allowed to become better people by our own definitions, not just those prescribed by schooling. That is partly why discussions of identity and power are so important because the goals we have for students may be disconnected from the ways in which they see themselves now or in the future. And, yet, even in constructing and privileging certain truths over other possible ones, discourses are malleable, subject to outright rejection or (re)inscription (Butler 1999).

That is, teachers who have adopted a sociopolitical stance may decide not to judge their success only on whether they close the achievement gap (Gutiérrez 2009), but also look for ways in which students are being creative and imaginative when doing mathematics or for when students see a more positive relationship between themselves, mathematics, and their futures. One difference in the way discourse is interpreted by Foucault is that unlike other theories that imply an overarching metanarrative, where people are oppressed by the narrative, post-structuralism ascribes more agencies to individuals in recreating or shifting meanings of the discourse.

In a recent paper Stinson and Bullock (2015) discuss the complexity of mathematics education and the need of including multiple conceptual and methodological approaches in order to face this complexity. They suggest a critical postmodern methodology by exploring, hypothetically, the different and somewhat discomforting possibilities for data collection, analysis, and representation when research is framed with/in critical postmodern theory. As they claim, mathematics education community should encourage expanding the frontiers of science by supporting not only those who look toward science to answer concrete questions but also to those who look toward science to generate different questions that might produce different knowledge and produce knowledge differently: "In the end, we believe that the mathematics education research community should embrace chaos as opportunity and as evidence of a vibrant of a vibrant and vital field" (Stinson and Bullock 2015, p. 17).

### 5.3.2 *Ethnomathematics in a Broaden Conceptual Landscape*

The community of ethnomathematicians is both heavily responsible for promoting the social turn, and why not sociopolitical, and has remained as keepers of the flame, so-to-speak, maintaining a vanguard and marginal status that continues to search for its purposes and for forms of community building consonant with its aims (Stathopoulou and Appelbaum 2016). D'Ambrosio (1985) introduces ethnomathematics as the "Way different cultural groups mathematize (count, measure, associate, classify and draw conclusions). This is done using practices; knowledge, dialects and codes vary from culture to culture" (p. 45). In the 90s, Appelbaum (1995) called for a creolized interculture characterized by the poetry of Aimé

Césaire and the emerging discourses of Anthropology as cultural critique (Marcus and Fischer 1986).

Although the ethnomathematical approach originally emerged as a response to issues of mathematics/mathematics education and inequalities in particular contexts (i.e. non-Western countries), we consider it as a dynamic field of knowledge and action built around the notion of culture. Ethnomathematics considers other aspects of life and their connections to mathematics/mathematics education; therefore, as an approach, it can inform mathematics education in Western areas and respond to issues of social justice. In this perspective, in order to better understand parameters that are connected to our understanding of how inequalities are constructed and prevent the mathematics education of group like Roma, we can borrow tools from post-structuralism/postmodernity. In this section, ethnomathematics is also discussed together with ideas of multiculturalism and diversity education.

Since the notion of culture is crucial in an ethnomathematical framework, it is needed to be clarified that, here, it is conceived as a complicated analytical category: "*an historically transmitted pattern of meanings embodied in symbols, a system of inherited conceptions expressed in symbolic forms by means of which men communicate, perpetuate, and develop their knowledge about and their attitudes toward life*" (Geertz 1973a, p. 89) and those "*webs of significance people themselves spin*" (Geertz 1973b, p. 5). Although culture is considered as a way of understanding the others and as recourse, at the same time, it can be an obstacle since it is a way to homogenize people who may belong to the same community in order to cover the problems and inequalities by pretending that they are cultural differences. This is done mostly in regards to marginalized groups.

Considering the problems that confront in (mathematics) education these kinds of groups, identified as just cultural different, we ignore other dimensions: culture neither is produced in a social vacuum nor is independent of policies, both in macro and/or micro level, and power/power relations are crucial for their identity construction. So, in order to deal with these complicated frameworks we adopt moreover the idea that "*power relations forms a dense network or tissue that crosses the mechanisms and institutions not located precisely on them we exploit poststructural ideas*" (Foucault 1978, p. 120).

In the past several decades, researchers have approached ethnomathematics through a variety of points of view: as a research activity (Gerdes 1994); as a subject of study (D'Ambrosio 1985); as a way of behavior (Zaslavsky 1994); as a form of expression (Borba 1990); as a language of communication (Borba 1990) with the notion of culture that permeate all of them. Unfortunately, this early phrasing of ethnomathematics, consistent with the anthropological understanding of culture as defining difference, was not yet influenced by the discourses of cultural critique, nor by the post-colonial concepts of creolized intercultures, and instead re-established indigenous mathematical and pedagogical traditions (those not included in the standardized, normative, Colonialist curriculum) as inferior and less sophisticated than those set by developed nations as universal.

Critics of ethnomathematics sometimes misidentify the program as merely a field of research and dismiss ethnomathematics as political correctness gone too far. It is certainly challenging for many scholars to confront the realities of mathematics, as well as educational institutions, as the arms of a political and ideological posture. Nevertheless, ethnomathematics requires this (Stathopoulou and Appelbaum 2016). As D'Ambrosio (2007) asked, "If proposing a pedagogical practice which aims at eliminating truculence, arrogance, intolerance, discrimination, inequity, bigotry and hatred, is labeled as going too far, what to say?" (p. 32).

Lots of critique inside and outside the field of ethnomathematics provoked reaction and gave the opportunity for furthermore development mostly regarding theoretical/epistemological perspectives of the field. In their 1997 paper entitled *The end of Innocence: a critique of 'ethnomathematics'*, Ole Skovsmose and Renuk Vithal discuss broadly the issue of ethnomathematics definition highlighting the problems that prefix *ethno*, as a word incriminated in the context of South Africa causes, despite it is clarified that this prefix is note referred to races. Also, they notice that ethnomathematical practices that take place in a particular cultural group are not only framed by the natural and social environment but they are related to interactions with the power relations both among and within cultural groups, as well. In other words, ethnomathematics has been critiqued that, at its origins, its political dimension was not obvious, even though D'Ambrosio connects ethnomathematics with social justice very early on. In later texts, he definitely makes this link more explicit.

In his doctoral thesis, Barton (1996) explores the philosophical dimension of ethnomathematics. Exploring the connections and compatibilities between ethnomathematical perspective and several philosophical aspects concludes that Wittgenstein theory gives a philosophical framework for ethnomathematics; despite Wittgenstein has not focused on culturally relevant mathematics, the way he approached philosophy laid the foundations for the study of cultural diversity. This connection of ethnomathematics with Wittgenstein opened the door to perceive ethnomathematics under the postmodern/poststructural[4] perspective.

Bello (2010) makes also a poststructural *reading* of ethnomathematics with references to Wittgenstein and Foucault. By using the Wittgenstein's notions of language games, and Foucault's notions of discursive practice, power-knowledge, and truth games, the author discusses Ethnomathematics theory as a discursive practice whose rules establish not only ways of seeing and saying about mathematics practices of identifiable cultural groups but also as multicultural device of government when defining and reorganizing identities and differences.

Knijnik (1998) develops her argumentation about the inclusion of ethnomathematics in the postmodern scene in her attempt to respond mostly to the critique of

[4]The analysis of the two terms exceeds the objectives of this work, but it is necessary a basic reference. Many authors use alternative or complementary the terms. In short, we could say that "being postmodern indicates a historical, sociological point of view. Being poststructural indicates a strategy of analysis" (Yeaman et al., p. 26).

Taylor (1993) and Dowling (1993). Dowling supports that ethnomathematics is a project of Modernity, basing on his interpretation about monoglossism: he supports that the monoglossism of a person is transferred to the monoglossism of a cultural group in ethnomathematics framework. Taylor focusing, for his critique on the work of Walkerdine who considers as "pre-eminent theorist of *ethnomathematics* (Knijnik 1998, p. 2) stresses the strong connection between ethnomathematics and *modernity*, when speaking about a "profound ambiguity in the ethnomathematics discourse" (Knijnik 1998, p. 2).

Knijnik (1998), finally, takes into consideration the above aspects together with ideas that came from Walkerdine work and Skovsmose and Vithal (above mentioned paper) in order to justify why ethnomathematics could be seen as included between Modernity and Post-Modernity. She speaks about her own experience developing empirical projects with the *Landless People*, in Brazil, in an ethnomathematical perspective. Exploiting her experience she highlights the role of the power relations produced within that social movement, which led her to define what kinds of knowledge among those practiced by their members are instituted as regimes of truth, in the words of Foucault.

My personal experience in my previous involvement with Roma communities led me to the realization that the enrichment of ethnomathematics with perspective of postmodern/poststructural could provide us more tools for understanding and interpret complicated situations that are connected with Roma children schooling and particular their mathematics learning; learning of school mathematics. Here I feel the need to speak personally, since it is appeared for me a contradiction: on the one hand, I totally respect the culture, the cultural differences, and the mathematics knowledge of each group, and at the same time I am strongly interested in promoting formal mathematics education for Roma children.

It is difficult to separate cultural differences and cultural choices from the social and political situations that are related to them. This has generated a number of questions to me: To what extent, what appears as cultural feature is really cultural? Why not connected with the fact that this group is been located out of the boundaries (in both geographical and symbolic level) of the broaden community? Why is the claim that Roma parents are not interested in their children school attendance because of their culture (and how this perceptions are constructed) so strong? Why is the fact, for example, that in some cases there are not available buses for their children to move from the community to school largely ignored? Why is the fact that many non Roma families are reluctant in having their children attending common classes with Roma children, which, therefore, makes the latter consider school as a hostile space, not considered?

Just recently, Christos, a 12-year old Roma child who had moved for a few months to another place, told me that for long time he did not attend school in his new area because he was the only Roma there and other children made fun of him, calling him names like *gyftaki*, which while it literally means *gypsy boy*, it also has a negative connotation. Some researchers suggest cultural relevant pedagogy as a response to the realization that some learners need more attention due to obstacles to social change (Appelbaum 2002).

Culturally relevant pedagogy is an approach that validates students' cultural backgrounds, as ethnomathematics also does, and ethnic history, providing ways for educators to support cultural connections between the school and the community, while simultaneously challenging social injustices by identifying obvious and subtle individual, institutional, and cultural actions that perpetuate social structures (Rosa and Orey 2011). Therefore, ethnomathematics and culturally relevant pedagogy together create opportunities for mathematics curriculum relevant and meaningful for students, while the same time maintaining interest in issues of equality in and out of the classroom.

Compatible also with an ethnomathematical perspective is the diversity in mathematics education, which recognizes that "intercultural relationships are (maybe always) asymmetrical, and that intercultural education should aim to repair the damages caused by attention to what once might have been called egregious cultural differences" (Appelbaum and Stathopoulou 2016, p. 348). Instead of removing the differences, or criticizing current practices as harmful to social justice, diversity educators work with the recognition of differences and promote direct attention to how the use of cultural difference by a language of multiculturalism might be coopted for social justice. Diversity educators search for those times and places where the function of something designated as *cultural difference* serves to support a new version of racism or marginalization, as for example, in the expression, *culturally incompatible*, in order to respond together with their students (Mishra 2012).

## 5.4 The Project

A linguistic colleague and I had undertaken to support Roma preschool children mathematics and language learning with ultimate aim Roma social inclusion. Despite of this focus on Roma children education, being aware of the complexity of education and much more in the cases of students coming from out of main stream backgrounds, marginalized groups, we were led to broaden our fieldwork including their community of origin.

Our methodological choices as well as the fieldwork in details are presented in the next section while here the planning, the processing, and the implementation of the program (project's logistics) in both school and community are outlined. On the one hand, the teachers and we (the academics) conducted research on the spot. Following a *Collaborative Inquiry* framework, together with teachers we explored the possibilities for incorporating the knowledge and experience that Roma students bring to schools (funds of knowledge). On the other hand, through a community of practice we had the opportunity of continuous interaction: teachers had every week to present a report, addressing to the whole community, regarding the design of their teaching and its implementation in the classroom while all members (teachers and academics) of the community had access to it, providing feedback. Furthermore, regular face-to-face meetings were including in the community's

actions. The communication and the interaction in the framework of this community of practice, informed our next pedagogical activities.

For our project's purposes, ethnographic research in their community of origin was of great interest in order to improve our understanding and our interface, through real contact and relationships, aiming to their education and social inclusion. Searching for funds of meaning in the students' everyday life, we drove down the streets; we observed the neighborhood, the surrounding area, and the external markers of what identifies this as a neighborhood. We visited student's homes and we engaged in conversations with their parents and other family members regarding their habits, what they do, where they go every day, how they are involved with their children education; creating for them the opportunities to express their expectations regarding education, their problems connected directly or not with education. For data collection we used three techniques of CCM: communicative life story, communicative focus group, and communicative observations. Besides, participation in festive activities (for example celebration of cycle live) helped challenge the (symbolic) boundaries of the two communities.

### *5.4.1 In the Community*

In the community we selected a critical ethnography together with CCM (Gómez et al. 2011), since it has proven successful for analyzing educational inequalities in ways that generate real transformation towards social justice. This methodology derives from Habermas' communicative action theory in which he speaks about the universality of capacity for language and action: "All human beings can communicate and interact with others, regardless of their cultural, ethnic, or academic background" (Gomez et al. 2011, p. 237).

In a framework of a CCM, researchers co-participate with the members of the community creating situations of equal ability and responsibility to evaluate and criticize research. Both a researcher and a participant work on the same level and go beyond the dichotomy of a researcher and an informant; researchers and participants are engaged in common practical projects aimed at social transformation (Caterino 2013).

The research cannot exclude those who play ordinary roles in society aiming to understand and transform social reality; in the same way, communicative research techniques aim to generate reflection among people who want to better understand the topic they are investigating as a first step to promote change. Indeed, communicative research with cultural minorities, and people who have low incomes and no academic background, has proven that when their voices are included in research, they help advance the state of the art, and the research moves from an ethics of interest to an ethics of responsibility (Gomez et al. 2011).

The above theoretical and methodological perspective and the realities we faced in the field guided some of our next initiatives. Although originally the project had an orientation from top to bottom, we turned it to bottom-up actions. These choices

were detected by our fieldwork in the students' community of origin where we participated in several activities, e.g. professional, live cycle events etc. Thus, we had the opportunity to explore on the one hand, their collective and subjective perceptions and representations about education, and on the other hand, the funds of knowledge, practices, and discursive practices related to mathematics learning, exploitable for our educational interventions.

At the same time we were organizing meetings with other institutions, involved in Roma issues, where Roma people's *voice* was asked and dialogue developed in these meetings led to our next steps. Despite our focus on child education a lot of other needs, explicitly or implicitly connected with education, emerged. For example, the factor of poverty affected directly school attendance: there were families without the capacity to give a snack to their children for the time they were at school or pocket money to buy something from school cantina. After the head of the Church in Volos undertook this expenditure school attendance was increased.[5]

For data collection, we used three techniques of CCM: communicative life story, communicative focus group, and communicative observations. Part of our data is presented through the five episodes/situations that follow, highlighting how complicated education/mathematics education is for unprivileged groups such as Roma in Greece. A main issue that emerged through our communicative observations and participation in Roma community of Aliveri[6] was the fact that Roma people experience long-term social processes of discrimination and separation from the broader (non-Roma) community. This is even represented literally, as a marginalized district at the outer border of the city of Volos (Greece), with distinctly real, railway lines, and symbolic boundaries from the rest of society. The differentiation of the two communities' settlements symbolizes the lasting, maybe less visible, production and reproduction practices of cultural distance on behalf of the non-Roma community members. The fact that the two communities appear as two parallel universes has consequences on Roma children's education.

The first of the situations presented here, concerns the occasional strong resistance from the part of the non-Roma parents against the efforts made towards a smooth operation of classes with students from both communities. Using as a pretext for their pro-discrimination arguments, the cultural difference and the insufficient knowledge of the Greek language on the part of the Roma students, the parents of the dominant community seem to shape and perpetuate. Among other things, hegemonic perceptions and positions of distancing vis-à-vis the value of the

[5]In some other cases we took into consideration the needs that were emerged through our communication in the next project's application (Inclusion and education of Roma children in the region of Thessaly-code 5001369 and IIS integration Judgment A.P.17556/10.14.2016) that has started in November, 2016). For example, among other initiatives we established a school for the parents of Roma students for familiarizing them with the school structure and whatever constitutes the school in order to be able to support their children.

[6]The main pragmatological material used here it is coming from this particular community of Aliveri.

*other culture* in a public space such as the school and hence, seriously undermine Roma children access to formal education.

The communicative procedures helped us to identify issues of discrimination and exclusion. Through dialogue with parents (from both parts) and formal structures (school, administrative services etc.), a subversive discourse was developed challenging the ones of the dominant society resulting in the transformation of the exclusionary situation. However, our attempts were not effective at all times for both communities: this school year some of non-Roma students were moved to other areas of the city because of the increasing number of Roma students. A new challenge now for both teachers and researchers is to keep non-Roma students in school, since the aim is the coexistence, and not to make the school a school for Roma, a ghetto. This recent reality makes obvious the complexity of the support of Roma students' education, it looks like a Lernaean Hydra; killing one hand two are appeared.

The second episode concerns the material derived through a communicative focus group; members of a family and their friends constituted the group. Issues like insurers topics, permits (for street vendors), housing conditions (houses without electricity), unemployment, poverty, etc. emerged, that more or less, obviously are strongly connected with education, since it cannot be considered as neutral; attitudes and at the same time life conditions are strongly involved. The voice of a Roma father brings this dimension to the fore. Antonis, a (35-year-old) father of one of the school students:

> School for us is a kind of luxury. For us, the one who has the money can attend school and the one who has no money can't attend (….). The children need food, clothes and hundreds of other things, and all of them affect the school (he means the attendance of the school) (…) we have understood that only school (education) will change us but some help by (…) who are in charge, is needed. (…) The fact that breakfast, since last year has been provided (by Metropolis and other Municipality's structures) is very important to me (…). I'm doing sacrifices (…) if children go to school; but they could have a better life".[7]

A friend of his also highlighted the problems they face regarding getting permission for open markets and lower taxes: "In order for Roma have their children at school they need better life conditions (…) because of poverty children do not go to school but are on the streets begging.

The third episode emerged by using the technique 'communicative daily life store'. Although the part of the narration presented here concerns not a real life story but a tale narrated by an old Roma, it reveals their collective representations about their education shedding thus light on their perception about Roma education in the past, in the present and in future expectations.

[7]The above communicative incidence took place the last school year. At this time, his family was living in a house and his children attended school. This school year, because the retailer license is on the name of his wife, they have to move together all around the country, making children's school attendance problematic. The response to this situation was to send the boy to his grandparents and to stop girl's attendance.

*Once upon a time, there was a King. The Queen that used to give birth to girls. The King disappointed by this situation threatened the crones midwives who helped the Queen to give birth that if the next child was a girl again he will kill them.*

(…)

*The day of the next birth came and, for one more time, the Queen gave birth to a girl. Beside the palace at the same time, a Roma woman gave birth to a boy. In order to save their lives the crones midwives changed the girl born by the Queen with the young Roma boy.*

(…)

*Both children reached the age of 15 years and the young Queen did very well in school. She was excellent while the young Roma boy although he was 15 years old he continued to attend a first grade class; he became 15 years old but he continued to attend first grade.*

*One day the girl followed her mother who was going to sell baskets. During their trip they met a group of soldiers that were inviting people to discover an encrypted message that was hidden on a coin and to become the winner. Several educated people tried but nobody managed to give the right answer.*

*The girl asked to try and soon she decoded the message: if in January, February, March, April there is no snow we will not have a good summer (implying difficulties in crops). After that the girl became the winner, the King who was next to the group of the soldiers invited the girl to visit the palace. The King was impressed very much by her and wondered: how could a Roma girl be so smart and so educated and to be in a so high level.*

*Among other questions, he asked her about her birthday and realized that she was born on the same date with his son. Then he started to wonder how that has happened that his boy continued for so many years to attend the same class and the girl to be so perfect. The girl t he suspected that was so well educated was not possible to be a Roma girl. Finally, he forced the crones midwives to admit what had happened.*

*The Gypsy boy turned 15, while still in the first grade*, was the selected epilogue by the old Roma for this story telling.

The fourth communicative episode comes from my communication with two high school Roma students, Christos and Stelios who among other things were asked to talk about possible difficulties they mainly confronted in the first years at school and how those affected their school trajectory. Part of this is here:

Charoula: *Which were the main problems that you faced the first time at school?*

Christos: *We confronted a lot of problems coming for first time at school.*

Charoula: *Like what? Do you remember?*

Christos: *The language, lady, because we have learned from the time, we were little children to speak another language … and then (…) lady it is like the Greek people learn English: we confront the same difficulties to learn Greek. It is as a second language but at the same time it is a necessary language (…) the first time lady, I came here at school I could not talk at all!*

Charoula: *But, why? Do you not speak Greek at home?*

Christos: *No, we used to talk, but I was embarrassed to talk to the other children* (he means not Roma children); *I was scared that I would make mistakes … after a couple of years had passed, after it (…) it was ok (…). I know now* (to speak Greek).

Charoula: *Now, do you face any kind of difficulties with language?*

Christos: *No.*

Charoula: *You mean while you talk; but when you write.*

Christos: *When I have to write, yes, but just to speak with the children I have no problem.*

Charoula: *What about you Stelios, growing up what kind of difficulties did you face*;

Stelios: *Growing up I had no problems, on the contrary; growing up lady the situation was better (…). I learned better the language; I had no problem. I started mainly to behave like the others (not Roma students), having not forgotten my language, but (…).*

Charoula: *You do not need to forget your language!*

Stelios: *But I was learning the language better and better; just in the beginning (…).*

Charoula: *Did you face difficulties adapting to the classroom?*

Stelios: *(…) at the beginning, yes!*

Charoula: *Only because of the language or because of other things, too.*

Stelios: *The behaviors lady because we were taught other modes of behaving.*

Charoula: *What things, regarding behavior, did stress you; what was hard for you to do the first time; what was difficult for you in the classroom?*

Stelios: *(….) in general lady, (I did not know) how someone should address the other people (…) what means "hello", what means "how are you", while at the same time the other children (non Roma) knew from the time they were born what 'hello', 'how are you' mean. How is this thing, how is the other, they were able to speak comfortably.*

Charoula: *You mean in the classroom; which was your behavior in the classroom? Had you attended preschool education?*

Stelios: *No, I had not attended. I was ashamed because I thought the other children were something else, something different, something elusive, because lady my father, since I was a little boy, used to say to me: you must be like the Greek people, not to be like the other Roma children that are used to getting married very young, you must be different, to have your own work to go out in the society* (he means to be a member of a broader society). *So, lady, when I went to school I thought that the non-Roma people were so different, so important, something that I could never reach.*

Fifth episode is the narration of Panagiotis, a young Roma boy who studies at the University in Volos; the only person of the community that has reached University level. Since he represents a positive facet of the community, his experience from school that resulted in a successful trajectory is important.

Charoula: *To what extent did the language cause difficulties in school performance for you?*

Panagiotis: *And now is difficult, someone who is bilingual always faces problems, regardless of speaking good Greek.*

Charoula: *But, you speak well.*

Panagiotis: *My writing is much more poor.*

Charoula: *How did this difficulty in language affected your performance in mathematics.*

Panagiotis: *In a word problem I could not understand what the problem was asking.*

Charoula: *And (…).*

Panagiotis: *I needed the teacher to read 2-3 times and explain it.*

Charoula: *What do you think we need to know in order to help effectively the younger Roma children that attend now school?*

Panagiotis: *I believe that, since the young Roma are used to speaking during the majority of the day Romani, teachers should speak basic Romani, not fluently, but just as a bridge to come closer to the child. Last year when I visited the kindergarten, the teacher spoke to me about her experience of a Roma child that was crying for a long time saying 'pani'. This word in our language means water, so the child was crying for water. After this, the teacher started to learn our language. This is very important for the children. When children listen to you speaking in their language they not only feel happy but also welcomed and accepted. In this way, you come closer to the child. I think this is an important tool; teachers to have the basic knowledge of our language.*

(…)

Charoula: *How do you experience the boundaries of the two communities?*

Panagiotis: *Speaking about the boundary of the two communities (…). For two years, I lived in a students residence. An uncle of mine, an old man, asked me: what has happened to you? Have you forgotten us? Have you become Balamos (non-Roma)? I explained to him that although I communicate a lot with non-Roma during day, I have not became Balamos and I'm not going to became, I'm Rom. (…) the boundaries and the lines, yes I have experienced them. But I think you decide where you would like to belong to. Me, as Panagiotis I have transcended the boundaries.*

Charoula: *How the people in your community perceive what you are doing?*

Panagiotis: *Some of them are thinking positively about the fact I am in the University, some others can't understand what I'm doing in the University.*

Charoula: *How was your experience the first time you attended the kindergarten? Were you the second child of your family at school?*

Panagiotis: *I was the third but the first one at the kindergarten. It was so unprecedented for me, completely different from my community. I could understand Greek because my father had Greek friends, but not everything. I did a clever thing: I followed what the other children did. At that time (1996), I was the only Roma child at school.*

*(…) In the community, I did not have many friends. Because of my disability I was mocked by children in the mahala (community).*

Charoula: *What kind of difficulties did you face regarding mathematics when you were a school student?*

Panagiotis: *The exercises on the blackboard that teacher used to write. He wrote down an exercise and then he moved and seat in his desk. I copied what was on the blackboard and left it unsolved. He never came to me to see what I was doing, he never asked me: did you solve it? Teachers are usually interested in the students that are good, they do not devote time to all children. Every child is different with different needs. The first two years at primary school, it was difficult for me to understand. But, in the 3rd grade I was attending a special class (a class for integration of students with learning difficulties)[8] and a teacher, Vasilis K. helped me very much.*

Charoula: *How did he help you?*

[8]It happens very often to be included in this classes students that have no learning difficulties; students that have just a different cultural background, illegally.

Panagiotis: *First of all, he gave me a test in order to see which my level was. (…) for example, I had a problem to learn the multiplication tables. He did not ask from me to memorize it; he gave me some materials, some blocks and explained to me how to use them for understanding and not for memorizing.*

The main common characteristic that is depicted in the above situations, more or less evident, is the notion of power relations that permeate all aspects of life for this marginalized group. The effect of power relations is so strong that it manages to dictate even their collective representations, which are internalized and adopted as their own. The structures and the people of the dominant culture have the power and *possess the truth*. As Foucault has written (1979), power and truth are intimately intertwined. Truth is perspectival: it is the mere creation of the strong. Roma people marginalization even in formal education depicts a situation of inequalities.

Through the communication with the young Roma the complexity of education and particularly their school mathematics learning is obvious. They do not only confront problems because of the language, a written language while their own is only oral, but also problems to understand the cultural codes in communication and the norms of a classroom. It is difficult for them to understand the norms and to adapt accordingly. They come to school context conceiving themselves as inferiors and expect through the school to become something (socially) *better*.

Working in an ethnomathematical and CCM framework, we faced the challenge to pursue ways of improving social situations aiming at social justice and people's dignity, a common aim of both approaches. Our response addresses both: the community and the classroom. In order to support the individual and social emancipation of the Roma community of Aliveri, we incorporated intracultural and intercultural comprehension processes and actions/initiatives that counteract the existing border-making practices, thereby creating and offering opportunities for public participation to all inhabitants of the area.

As part of this process, we organized events together with other organizations and structures and the members of the community, in order to challenge the boundaries of the two, separated, communities. The interaction of all contributors, academics, teachers, students, members of the Roma community, other local institutions or structures that act within the community, emerged as a necessity for responding to the complicated issue of (Mathematics) Education for Roma students; research data were exploited in the classroom, concerning both understanding cultural conflicts and learning mathematics.

### *5.4.2 Our Action in the Classroom*

Preschool teachers, supported by us, in mathematics and language teaching, used to teach in several and different structures in both the Roma community and in typical schools. Aiming to develop a continuous and egalitarian dialogue and interaction, we developed a community of practice, as it has already been mentioned earlier, comprised of the academics involved in the project and the preschool educators.

Our educational interventions were informed by a comprehensive and interdisciplinary range of socio-cultural approaches that support educational practice: culturally responsive and intercultural pedagogical orientation (Gay 2010; Govaris 2013); approaches that consider the school as a place to create relationships and identities for students with cultural and linguistic diversity (Moje et al. 2004; Gutiérrez 2013), ethnomathematics (Stathopoulou 2005). Therefore, we implemented a *bottom-up* curriculum, encouraging teachers to exploit students' knowledge for mathematics and language teaching.

#### 5.4.2.1 Examples of Our Bottom up Curriculum

According to an ethnomathematical perspective, we explored students' funds of knowledge, identified through our fieldwork on the community of Roma, and incorporated relative ideas in our bottom up curriculum. We tried, on the one hand, to challenge the dichotomy of informal-formal knowledge and on the other hand, to create a *space* in the classroom encouraging Roma students' participation and their voice strength in the classroom. The two activities that follow are based on the pragmatological material selected on the spot.

On the one hand, because traditionally they had no permanent residence and on the other hand, because of the poverty many houses are still shanty houses that do not respond to the people's needs, part of their activities take place outdoors. So we had the opportunity to observe Roma people's activities, either household or entertainment, happening outside home. Playing games with cards was an activity of this kind. Groups of adults, groups of young Roma (even younger than five years old), mixed groups of young Roma and adults were very often playing together. It should be mentioned here, that playing cards, often aiming to win money, is considered a negative activity by the broader community. By incorporating games with cards in our *bottom up* curriculum, we transformed an everyday activity, familiarizing Roma students to a mediation tool that facilitated the teaching of mathematical concepts and number sense.

Regarding the second activity, while the 'pretext' was the narration of a fairy tail about a trip of a lion, identifying it with the experience of Roma students that are used to travelling very often, was the aim to be investigated here. Since Roma traditionally are travellers for professional purposes, and the whole family is used to participating in these journeys Roma children have strong travelling experience. In this activity, we tried to integrate their experience to the development of space notions and other mathematical ideas as the distance, the direction, the comparison of magnitudes (length) like the strait line, and generally the line. These ideas as well as the experientially understanding of the role of the note, and consequently the symbolic representations as well as the intuitive approach of the notion of *scale* would re-inform their out of school experience.

The first activity, as it has already been mentioned above, concerned the card game. The learning objectives of the activity were to recite, read and write numbers up to 10, recognize numerical amounts using direct identification strategies, count

objects up to 10, find the previous and the next of a number up to 10, and compare quantities and numbers to approach the operation of addition and subtraction.

Roma students, due to their familiarity were willingly involved, gained *voice* in classroom, could count up to 10, and with the help of their teammates they could recognize the symbolic representation of the numbers appearing on the cards. Some quotes from the unfolding activity. From the teacher's question: "Which is bigger? 2 or 8; and why?" the student answered: "8", "It's much more!" (Showing symbols on paper, one by one and counting mentally) and to the question: "Which is bigger? Five or seven?", the student answered: "7". Lipizune 2" (Lipizune: sounds like the appropriate Greek word (leipoun) meaning: missed two), and the teacher said: "Yes, missing 2" (accepting the developing interlanguage). During the negotiation of this activity, Roma students presented a significant difference in both, the involvement in the learning process and in the classroom interaction (with teacher and peers).

The other indicative activity, presented here, is part of a cycle dealing with the development of spatial thinking of our young students. In this cycle of activities, the questions were: (a) which is the understanding of our students of fundamental mathematical concepts associated with navigation in the space (compare sizes, perception of the scale, location and description of routes and spaces); (b) how the teaching would promote the expansion of the symbolic repertoire and transformation of space's representations? (Valai et al. 2015).

In order to plan the activities the logic of Multiliteracies was used: it refers to various channels and forms of representational embodiments (multimodality) and aims at different ways (cognitive processes) in which students can take ownership of knowledge. The methodological framework allows the incorporation of culturally acquired knowledge of students (Gutiérrez and Dixon-Román 2011). In terms of implementation, initially, students were introduced to the theme of navigation in space through reading a tale, which was about a lion wandering in an area. The map (see, Fig. 5.1) of the area in which the hero wandered constituted an organic component of the text, it was available to students and its usability as a practice of representation was exploited during interactive exchanges that accompanied the story telling.

**Fig. 5.1** Students working on the map. *Source* Personal file

Students were actively involved in a meaningful for them activity: the map was an attractive multimodal text incorporated into the story telling and simultaneously it was understandable as it was based on their experiences in visiting different geographic locations. Although they were not familiar with the use of a map, their travel experience, following their parents in their professional work, contributed to the understanding of the map functionality as a spatial representation tool. Some parts of the dialogues in the classroom:

Teacher: *How do you think we could design your homes?*

Student: *So (...)* (make a circle).

(…)

Disciple: *Here, over the mountain* (a remote cycle).

Teacher: *How?*

Pupil: *Circle!*

Teacher: *Which house is close to our school, the Paraskevoulas's or Chrisovalanto's?*

Student: *Uh!*

Teacher: *Which could you reach faster?*

Pupil: *Of Paraskevoula's.*

(…)

Teacher: *And then, which way the lion will get if he likes to go for swing?*

Student: *He will go strait and then to this way here (showing on the map) and he will go on the swings.*

Teacher: *So, turn right and then straight.*

Student: *Yes, right, straight.*

Throughout the above dialogue, students realized both the potential to represent the various natural objects by using symbols, buildings here, as well as to navigate through their imagination on the routes that are marked on the map. They could understand that the places and routes depicted on the map reflected potential ways of transition from one place to another. Furthermore, other concepts associated with the determination of space such as the distance, the direction and the comparison of magnitudes (length) were used successfully in this context, while the students could experientially understand the role of the note, and consequently the symbolic representations and could approach intuitively the sense of scale.

It seemed that the association of extracurricular activities, compatible with an ethnomathematical perspective, in conjunction with the strategic support of every communicative resource their hold (e.g. mixture of languages and other types of semiotic resources like the design, music etc.) created a hybrid learning space that supports student's involvement in the learning process. Accepting and validating what students considered as their 'own' improved their self-image and supported the renegotiation of their identity as equal participants in classroom interaction. The overall practice constituted a small step to the development of a framework where cultural backgrounds are a tool for change.

## 5.5 As an Epilogue

Being involved in young Roma (mathematics) education if you stay in the classroom observation you could only perceive the 'small picture'. An ethnomathematics perspective, being a holistic approach, gives the tools for studying the broader picture. According to my reading ethnomathematics, among others:

- Challenges the dichotomy of formal and informal mathematics knowledge/education;
- Supports all children's mathematics learning;
- Responds to the acculturation process that students (mostly those outside of mainstream) experience during schooling;
- Values any kind of mathematics knowledge working in its context.
- Challenges eurocentrism of knowledge and any kind of central or local authority/power (and the same time); and
- Fights indignity and injustice (it is a force for social justice).

Taking into account the original purpose of this project, which was, to support Roma (preschool) students' mathematics and language teaching, we conducted research in their community of origin. Our methodological approach based on ethnomathematical perspective gives us information about issues that explicitly or implicitly are connected with Roma students (mathematics) education, while post structural ideas regarding power help to attempt to offer some interpretations.

The episodes from the research on the spot come to the same scene with different roles. The first one constitutes an example of the problems that Roma community face because part of the broader community is negative towards the Roma children's inclusion in school. Basing on the *power of whom has the knowledge* very often people of the dominant society exploit the deficits of egalitarianism despite the rhetoric for the contrary, and they use various pretexts for exclusion. The second, the narration of a Roma father, expresses the difficulties, they confront to facilitate their children's schooling; difficulties that very often are real obstacles for them, preventing the implementing a policy of egalitarianism. The third episode, the story telling of the old Roma man, depicts the collective representations they have developed regarding their school performance; representation detected by the rest of society and adopted by them as realities. Since the others *have the power, they possess the truth*.

Similar collective representations emerged through the two next episodes with the Roma highs school students and the Roma University student. Education and the culture of the others are considered by them as something alien, unfamiliar. The students of the mainstream appear like the ideal they potentially are called to reach. Roma students come to school, an acculturation process, with these kinds of representations and so low expectations that are followed by low performances resulting in a vicious cycle of failure.

Despite the fact that this framework dictates behaviors all the time there is a place for subjectivities to select a different way of life, paying of course the cost.

Panagiotis, for example, seems to challenge the boundaries, in geographical and symbolic level, selecting to study and to live out of the community, but, trying at the same time to keep balance between the two strong identities.

Concluding, our attempt to respond to both learning and social justice issues was addressed to both community and classroom. Working with real people the situations are not linear; their complexity needs a combination of methods and methodologies to understand and to suggest changes. Ethnomathematics it is a perspective that can incorporate all of them and to respond to complicated situations keeping its main aim: to social justice and peoples dignity.

In the community, through a continuous and open dialogue with the members of the community and the co-existing with them in several situations and activities, we contributed to create situations of expressing their own 'voices' and of renegotiation of their symbolic boundaries, more strong than the geographical ones, with the broaden community contributing in overcoming inequalities. The knowledge we acquired through the fieldwork in the community contributed to the understanding of how and why inequalities are constructed through discursive practices making the inclusion of Roma and other marginalized inclusion just a rhetoric.

Also, the ethnomathematical perspective, together with the exploitation of funds of knowledge, informed our practices/our interventions in the preschool education. The design of the two activities in the classroom was based in students' culturally acquired knowledge, valuing this knowledge. As Sousa Santos (2012) notices, in *Epistemologies of the South*, the hierarchy of the knowledge, is not based on an intrinsic value of knowledge itself, but on the dominant social and economic structures. Thus, the dichotomy of formal-informal knowledge was challenging, giving to students a personal meaning. As a result, the students had access and actively participated in school mathematics knowledge, a dimension of Social Justice according D'Ambrosio (2012) and the teaching becomes more effective and the knowledge and skills more easily integrated (Ladson-Billings 1995; Stathopoulou 2005).

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