ASSEMBLING MATHLIFE CHRONOTOPES
'STREET MATHEMATICS' AS HYBRID OF EPISTEMIC/ONTIC KNOWLEDGE DISCOURSES URBAN CIRCULATION IN TEACHER EDUCATION

Anna Chronaki
University of Thessaly

Could mathematics teacher education courses be part of assemblages that grasp and circulate affective, sensorial, mnemonic and political temporalities going beyond a mechanistic reincarnation of thinking that deprives mathematics from the drama of life? By means of the project 'street mathematics', a hybrid of assembling mathlife chronotopes, the present paper attempts to explore the above question and its political significance for student-teachers in a teacher education program at times of crisis. It is argued, that through specific urban interventions in the cityscape student-teachers can experience such assemblages as events of epistemic/ontic knowledge discourses circulation through the public space of teacher education institutions and/or the streets in the city.

MATHLIFE CHRONOTOPES IN TEACHER EDUCATION

Bergson (1896/2004) at the turn of the 20th century critiqued time as a strict rationalist view of geometric space that reduces life into an ordered 'clock time' experience and fails to encompass the duration of inner life, irregularity, acceleration or deceleration. In mathematics teacher education such a limited sense of life is, currently, exemplified through institutional, national and global demands to conform with certain requirements for the production of efficient, flexible and competent neoliberal subjects through curricular and assessment practices. However, discourses of the ideal mathematical subject as a rational reasoned problem solver obeying the ruling stratum of 'proper mathematical activity' as quick methods of deep understanding, is being constantly subverted by subcultures such as our youth including student teachers, adolescents and children in the early years, or unschooled, marginalised and diverse groups, or disabled, racial and gendered bodies that tend to think, talk and behave otherwise in asymmetrical, paradox or unorthodox tropes.

In contrast to a rationalist time-space of conceiving time and life, Bakhtin (1981) suggests the notion of 'chronotope' to express the inseparable intersections of space and time -taking time as the fourth dimension of a space conceived as a material whole. Based on examples

from literature and the arts, Bakhtin insisted that time takes on flesh in becoming aesthetically visible and, equally, space becomes alert to time movement as plot and history. Narrative genres involve chronotopes (e.g. encounter, road, castle, parlours and salon, threshold and crisis) that relate characters with classes of identities, value systems and morals, make linkages with social, cultural and historical contexts and play a key role in the production of meaning and sense. In similar terms, the time-space through which a mathematical activity or practice is being narrated and reconfigured provides the habitus or the life-world where mathematical experience is connected to its sociopolitical field –creating, thus, mathlife chronotopes. Such cultural housing of maths is not neutral and can vary from word problems, to thematic contexts, project work, playful outdoor activity, indigenous mathematics, dramatizations or even fragments from cinema, poetry, literature, choreography, painting or photography. All these consist mathlife chronotopes where children, adults, materials, maths, life are assembled together in stories that reveal the affordances, pleasures and desires, but also, the symptoms and disorders of mathematics education hegemonic hierarchies.

Deleuze (1984/2006) employs the notion of chronotope to analyse thinking as a tacit temporal/spatial order where the subject encounters the means and obstacles to thought into a 'geographic' boundary that works as the milieu of situated meaning-making. Resorting on Bakhtin's question of '*what is a novel'* and answer that *'novel is never given*' but always forms, transforms and grows within specific chronotopes, Deleuze, in turn, contemplating on '*what is thinking for the philosopher'* locates its chronotope to a 'scream'. For Deleuze, the philosopher needs to attend primarily the biopower of 'scream' that forces the posing of a problem and not to any particular 'method' of resolving a problem or creating a concept. Whilst, the 'scream' cannot determine the outcome or provide the solution, it is this very embodied social act that makes the terrain of struggle visible and supports a determined desire, not a joy, to act on affections experienced by body or mind, superstition or reason. For Deleuze, such basic chronotopes to thought can extent into cartographies of; a) integrated spatio-temporal frameworks including order and mapping (i.e. temporal order inscribed in a map and a map evolving in temporal process), b) generic activities (actual and potential), generic roles and characters located into spatiotemporalities and c) boundaries and crossings. MathLife chronotopes as vignettes of mathematical practice can voice the possibility for thought in mathematics education. Such chronotopes are not always in harmony of the senses, but may come in discord as they 'scream' out the symptoms of the practice such as specific cases of repression, epistemic violence or disobedience, racial or gendered exclusions, language use limits, or body work boundaries

that orient us to search the disorders in the field (Straehler-Pohl et al, 2016). Could the 'scream', or at other times the 'laugh', the 'smile' and 'cry', enforce the researcher's will to encounter a cartography around a complex trap amongst hegemonic discourses of mathematics as disciplinary knowledge, mathematics as school subject, mathematics as everyday resource, historical and cultural product, or a formatting power for social orders?

The above question is particularly pertinent in the context of mathematics teacher education where the 'what' of mathematics needs to be, on the one hand, connected with the whom, why, where and when of children, activists, teachers, practitioners and people in the community, and, on the other hand, disconnected from a threatening rhetoric that assumes mathematics as key for ensuring national or world security, progress and development. Guttierez (2013), along with others, claims for political knowledge in mathematics teacher education programs as a urgent need in a neoliberal society where education becomes part of a consuming market of qualifications, competences and skills. How could mathematics teacher education support student-teachers and teachers not only for critical citizenship, but also for agency to navigate, resist, disrupt, trouble or subvert such essentialist discourses? How could our teacher education courses invest more into not only representing but also performing creative critical and aesthetically challenging mathematical interventions in ways that address the invisible or voiceless in our diverse worlds and destabilise the 'myths' around mathematics? In other words, how could we encourage our student-teachers and us to discern the 'scream' and the 'smile' in mathlife chronotopes?

Along these lines, the project of 'street mathematics' focuses on the centrality of questions of significance in sociopolitical life and mathematical creation, exploring the ways in which language-use and body-work in discursive practices of diverse mathematical experiences register the conflicts amongst social groups as they seek to meet and connect in public at the urban space.

STREET MATHEMATICS AS HYBRID

Although the term 'hybrid' steams from biology, the last three decades has been extensively used, and critiqued, in postcolonial, cultural and feminist studies, as well as, in sociology, history and anthropology of science. In postcolonial studies, Bhabha (1994) made an influential argument that the border or boundary region between two spatial domains is a new region of overlap that produces hybridity. This region, often called 'the third space', contains an unpredictable and changing combination of attributes of each of the spaces that contribute towards producing something new but, yet, related to the old –called the hybrid. His area of

concern was colonization politics, in which some native people find themselves caught in between their own culture(s) and the newly imposed culture(s) of the colonizers. This hybrid lives in-between, and despite/because its contradictions, conflicts and power politics, the hybrid is, always, where the polyphony of languages, cultures, discourses and identities exists.

The notion of hybrid in science studies has been discussed by Bruno Latour and Donna Haraway who argue how science is, ultimately, a factory of hybrids and maintain that a hybrid is the result of any process of association amongst species, methods or ideas. Haraway (1991) extends the notion of hybrid to cyborg, a metaphor borrowed from science fiction, in order to break binary distinctions amongst nature, science and technology or humans and non-humans, clearing, thus, the way for acknowledging diversity and difference. In human computer interface design studies, Lucy Suchman (2002) argues in favour for hybridity as a crucial aspect for both users and software professionals so that to maintain and foster the presence of multiple voices in constructing new knowledge and technology products. 'Hybrid' spaces where knowledge becomes re-circulated seem essential for facilitating co-construction, re-negotiation and re-configuration of concepts, ideas, meanings and alliances. The boundary-crossing or the becoming-hybrid as mutual learning in-between different standpoints, epistemologies and ontologies gain ground and appeal to theorists, designers and researchers who work in complex fields.

Bakhtin (1929/1981) also discusses hybridity as a way to capture the complexity of language(s) and discourse(s) and views hybridisation as fundamentally inherent in every discursive practice or language-act as heteroglosia, polyphony and dialogicality. Reading Bakhtin, Sholat and Stam (1994) describe hybridity as '*an unending, unfinalisable process*' which is '*...dynamic, mobile, less an achieved synthesis or prescribed formula than an unstable constellation of discourses*' and argue how hybridity becomes the unmarked case of social life foregrounding life's dynamism, contingency and uncertainty. Experiencing uncertainty in (mathematics) education is related to people positioning themselves in different global landscapes, networks or social worlds (e.g. ideological, cultural, technological) having to deal with contradictions, ambiguities and contrasting interests (see Skovsmose, 2005 about a discussion of uncertainty in mathematics education). Bakhtin, in a series of texts, negates language or discourse as essentialist or abstract systems but turns to emphasize their intersubjective consciousness and social nature. Any social interaction, including mathematical activity, carries within it diverse social biographies involving give-and-take of multiple utterances, languages, discourses, identities as

situated interactive multi-voiced hybrids of knowledge as both epistemological and ontological experiences (Chronaki, 2009). The concept of hybrid might well remain open for critique, but it is relevant for this study as it encourages to consider the epistemic/ontic dimensions of knowledge discourses circulation with people in the urban scape.

As explained elsewhere, the project 'street mathematics', rooted in the spatial metaphors of 'street', 'body' and 'move', evolves as a hybrid where vignettes of mathlife chronotopes can be re/presented, re/located and re/assembled. Such vignettes are depicted through audio-visual or text media and derive from long term ethnographic research (e.g. in situ observing and interviewing), and selections from artworks (e.g. paintings, literature, poetry) or pop culture (e.g. movies, graffiti, literary texts) in partial and impure connections to the cultural life of the city of Volos (Chronaki, 2015). Based on this hybrid space tapestry specific urban interventions have been curated, stories concerning our ways of valuing and relating with knowledge, knowing, and so-called knowers or 'specialists' (vs non-specialists) have been revisited allowing mathematical subjectivities to be reconfigured. As such, particular taken for granted discursive constructions of 'truth', values and valorisations concerning mathematical knowledge sharing, identifying and learning have been re/circulated, re/presented and, even, disrupted. The present paper, based on previous work, aims to discuss the conceptual frame of this work and its potential for teacher education.

KNOWLEDGE DISCOURSES URBAN CIRCULATION

A range of discourses exemplifying our relation(s) to/with mathematics, power, race, gender, desire, pleasure, society, identities, values, body-work, objects of creation or making through interview vignettes with local artists, craftsmen or scientists, or selected scripts in movies, literature, poetry, or work-pieces in arts, crafts, off-hand constructions, choreographies consist the material fragments of 'street mathematics'. Each of these offer opportunities for curating potential urban interventions in the form of installations and/or performances in connection with the social space of the locality. For example, specific scenarios have been organized in routes where one can walk into a virtual and/or physical route in the city (i.e. the cinemas route, the literature room, the dance-studio route etc.) that invites embodied interactions with specific clips from movies (e.g. Agora, Pi or Proof) or artwork connected with scripts form poetry, literature or vignettes

from choreographies[1,2]. These can then be experienced next to interview vignettes with local artists, craftspeople, scientists, youngsters or lay people, and along with children's activity inside and outside classrooms. As we move within the city either through the screen or the physical context we become the carriers of such knowledge fragments, and, we,

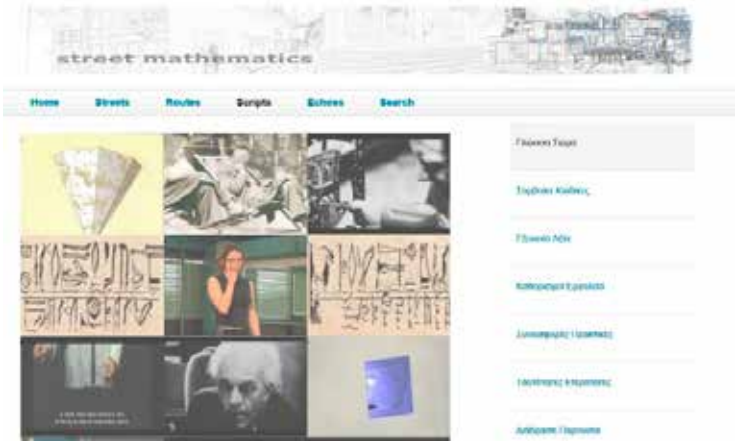

Figure 1: Aspect of the 'street mathematics' webpage

1. These fragments have been digitized and become re-assembled with certain layering technologies, such as; a) a cloud typology related directly to the dynamic data base, b) a virtual reality mapping of imaginary routes in the city of Volos, and c) locative aware media based detours, performances and narratives in the urban tapestry of the city. Users can walk into the streets of the city, through a multiplicity of embodied performances by means of their full 'body', their hands, eyes, feet, senses and their extended 'body' with the help of mice, touch screens, QR codes, locative games or the virtual reality model (Chronaki et al, 2011, 2014).

2. Specifically, the 'street mathematics' incorporates four distinct spaces, namely a) a dynamic data base where the project material as knowledge fragments are being archived, stored, retrieved, moved and relocated in other spaces such as the virtual reality model of the city, b) the physical space of the city of Volos from where much of the data originate, as they have been collected via in-situ observation and interviewing, have been reformatted into small episodes, scenarios and narratives, and now can return back to the city, c) the virtual reality model of the city Volos which becomes a canvas for artwork installations exemplifying specific spatial imageries in routes, landmarks and places, and d) the website of the project where the three previous spaces become presented, connected and accessed by the end users as they navigate the site. Moreover, the website interface provides ways for a meshwork amongst virtual and physical experiences within the city of Volos through specific sub-areas, namely; 'streets', 'routes', 'scripts' and 'echoes' (http://streetmathematics.ece.uth.gr/portal & Figure 1). It is within these sub-areas that the actual first-person experiences of end-users as navigators, players, learners, teachers, educators, simply derives, or even larkers, takes place (Chronaki, 2015).

ultimately, are not part of merely the embodied act of navigating, walking, strolling, or wandering in the streets of the city, but, in fact, we ourselves perform knowledge circulation. It is this bonding amongst the hybrid urban space of 'street mathematics' and the metaphors of 'street', 'body' and 'move' that, potentially, expand imagination, foster creativity and urge us for a revolutionary vision to 'see', 'touch' and 'experience' knowledge in other ways –as part of our life-worlds.

Some questions persist: How do we relate with our student-teachers in the locality and how do we reclaim the energy of everyday life that space and people hold for us? How do we deal with academic and everyday knowledge in the chaotic conditions of our worlds and how could we invent ways in which knowledge circulation does not work towards remaking 'colonial science', but, instead, paves subtle disruptions of colonial dispositions, binary meanings and poisonous affects? How do we relate with the presence and/or absence of mathematics and the multiple genres of narrating mathematical activity as we stroll and wander in the cityscape? Could the social space of the city enable us to open up relations with diverse mathematical practices? How does the urban environment become challenged and troubled by mathematical activity? How do such experiences affect mathematical subjectivities?

Contemporary life in the urban scape of the city of Volos is strongly affected by the economic debt crisis with serious implications on the closing down and fast desertion of a number of spaces in the public domain such as shops, bookstores, cultural centers, galleries and cinemas. An example is the Lido cinema located in one of central commercial streets (see Figure 2). Effects of the debt crisis are also discerned with our graduate and undergraduate students who, despite coping they can be in despair. On the one hand, unemployment rates have reached the highest level making their potential of finding a job at Volos, or even their possibilities of hoping for a better future, extremely slim –exemplifying the low exchange value of qualifications. On the other hand, lecturing methods assuming a direct knowledge transfer, especially now, at times of crisis, cannot be tolerated. Under conditions of wide social uncertainty, monopolies of academic imperialism cannot work with young people. Knowledge not as a 'matter of fact' but as a matter of concern and as a matter of care is of urgent significance today (Latour, 2005). Taking this into account, how knowledge as a mathematical practice of every day or scholar activity can be experienced in embodied performances that trigger them, and us, to question, resist and disrupt taken for granted 'truths'.

The 'street mathematics' project-in-progress provides ways towards addressing some of these questions as it becomes more and more utilized by student-teachers, children, adolescents, educationists, designers, urban

planners, performers, artists and architects. However, the aim is not really to provide answers, but, in a more modest way, to try address these questions in ontic terms, focusing more on mathlife chronotopes. Specifically, the collected scripts –as fragile life-world knowledge fragments in the form of inscribed accounts, visual images or text- concern human action in direct relation to a multiplicity of concepts, practices and activities that, conventionally, is named 'mathematics'. Reassembling them into the spatiality of streets and routes but also into the discursive configurations of scripts and echoes (see Figure 1) can, perhaps, work towards, not so much answering a question, but into reformulating its significance and scope by means of a bodymind urban materialisation and in ways that 'a question' is further stated as a matter of concern and care for the people involved.

Figure 2: The Lido Cinema at Kartali Street in the city of Volos. /
Figure 3: A hybrid of Lido Cinema

Interaction with mathematics concerns multiple narratives on how mathematics is being creatively or/and violently employed in varied practices (e.g. art, choreographies, constructions, crafts, games, gambling, economy, commerce, history, personal storytelling etc.), but also the relations people form with mathematics or through mathematics as part of specific economic, social, cultural or aesthetic practices. These narratives consist parts of stories with people who aren't necessarily mathematicians or formally educated. They consist scripts from varied sources such as films, literary texts, poems, art, constructions, or events having to do with everyday life, work, and leisure. Questions that enforce the scenario creation along with our student-teachers are; *'what might mathematics be for us or for others?', 'how mathematics appears or disappears in people's life?', 'in what chronotopes?'*

One such scenario has evolved around the experience of working with the simultaneous 'presence' and 'absence' of artist Giorgio de Chirico and his artworks form the, named after him, cultural gallery in Volos –the town of his birth (see Chronaki et al, this volume). The gallery is located just next to the University Library building at the parade of Metamorphosis Street. De Chirico's internationally renown artwork remains allegorical in how geometry is being employed to reveal 'emptiness' in engineer's passion for geometrizing the urban space. What might be the significance of Giorgio de Chirico's artwork today for us? How could we relate to his/our allegories of geometry use, but also how do we identify with the artist's 'scream' in his/our urge to discord with rationalist geometric space? How could we explore these by moving into critical urban (mathematical) interventions with our student-teachers and the locals in the street where de Chirico gallery is placed?

Another scenario of urban (mathematical) intervention, which is underway at the moment, focuses on reconfiguring the turbulent life of Hypatia, the Alexandrian mathematician through making relations with contemporary women scientists who live and work in the city of Volos. Scripts related to Hypatia's life, selected from the cinematic and literary sources, become present and accessible just outside the Lido Cinema (Figures 2 and 3) awaiting to make virtual and physical contact with local passers (Chronaki et al, 2011, 2014). What might be the thoughts, affects and affective experience created by such an associology, in Bruno Latour's words, for mathematics and science, gender and mobility? And, what else can this association may signify when it takes place outside of the closed Lido cinema?

The birth and growth of scientific facts as knowledge discourses circulation has been explored not only in the context of laboratory studies (Knorr-Cetina, 1999. Latour & Woolgar, 1979/1986) but also in remote

communities where science becomes either 'discovered' by western gaze or imported with western interests (see research studies in ethnomathematics, indigenous and first nation people, specifically D'Ambrosio, 1985). Particular issues have grasped research attention including the effects, processes and ethics of re/distributing cognitive activity, knowledge within social networks, between people and via inscriptions for much of the work of science. Of most importance is the critique of the vision of science as travelling from the 'metropolis' to the 'periphery' as 'colonial science'. Certain knowledge mobility practices that have been organised towards crossing cultural borders were opposed as colonializing acts. In addition, the idea of modern science moving towards a racial or cultural mingling has been also problematized by post-colonial theorists who wanted to emphasize that knowledge circulation is not just an issue of 'translating', 'interpreting' or 'moving' from the west to the east or to the south. Rather, scientific knowledge remains in a constant shaping and reshaping of ideas and, according to Winterbottom (2011), '*a continual dialectic exchange of information and techniques between Europeans and Asians throughout the colonial period*', but as she explains '[...] *unequal power relations often meant that this shared knowledge benefited the colonizer more than the colonized*' (p.268). However, this discussion has mostly left mathematical knowledge practices untouched, as if mathematics, in sharp contrast to science, remains a neutral domain of practice.

Scientific knowledge has been addressed by Bruno Latour as 'immutable mobile' in his work *Science in Action*. With mobility he refers to the transportation of knowledge in networks of interest whilst with immutability to its capacity of retaining key features whilst moving. Immutable mobiles are effects of costly technoscientific infrastructures (material, discursive, technological) and their study reveals power-control hierarchies in society. Whilst Latour (2005) stresses knowledge as immutable mobile, others have pointed to the fact that knowledge/objects transform as they become transported to other cultural contexts or networks of interest. Referring to previous analysis of the usage, development and transformation by locals of a bush pump in Zimbabwe in this mode, Law and Mol (2001) argued about the hybrid topology of technoscientific knowledge/objects. Although, such knowledge discourses circulation discussion refers mainly to science and not to mathematics, I would argue here that it is important to explore further its significance for mathematical activity and artefacts exchange and mobility. The 'street mathematics' project develops into such a direction of a hybrid space topology by deliberatively reassembling mathlife chronotopes. Hybridity becomes possible through the liminal re/constructions of virtual and

physical border-regions where distinct spatial experiences of knowledge exchange co-exist and blur. In this, enacting with the metaphors of 'street', body' and 'move' an epistemic/ontic knowledge circulation is being orchestrated amongst spaces, locals and ideas creating new imaginaries for our student-teachers, our students and ourselves.

KNOWLEDGE AS EPISTEMIC/ONTIC

As has been outlined in a number of related ethnographies, 'street mathematics' was inbred and ingenerated within the minds of children, adolescent and adult street sellers, in Brazilian cityscapes where a great number of people from the nearby rural areas had emigrated for a better life. The survival of those people was depended on their unskilled manual labour, their competences to establish small businesses, their tolerance and ability to deal with a periodical and unsure income and their solidarity in self-organised communities. The debt crisis of the 80s in Latin America made them face complex problems of unstable currency increases due to huge inflation rates that affected commercial transactions in both high and low commerce. Quoting Geoffrey Saxe (1989) '*Brazilian children address mathematical problems when they use currency in their everyday lives in such activities as purchasing a grocery item at a store. Because of the inflated currency, these activities give rise to the need to represent large numerical values and –to a limited extent- arithmetical calculations involving large values. Eventually, some urban children take up 'street professions' such as candy selling, and in the context of this practice, mathematical problems of everyday life increase in complexity. Candy sellers must produce frequent computations involving multiple bills as well as compute and compare pricing ratios*' (p.1424). Children along with adults, despite being unschooled, were encountered into these complex socio political contexts as competent problem solvers without the resource of schooling, without using pencil and paper, with no resorting on algorithms and formal tools but through collective, mental, haptic, and oral strategies (Nunes et al, 1986). In retrospect, one might note how their desire to live a better life or simply to survive embodied them with courage for taking risks, staying together and overcoming obstacles. It must be emphasized that in doing so, children, involved their minds by, primarily, involved their bodies in specific places.

Helen Verran (2004) through her ethnographic work with bilingual Yoruba children in mathematics classrooms in Nigeria discusses 'ontic' as a way to move beyond a Kantian notion of knowledge as being mainly epistemic. Following A.N. Whitehead, her perspective on 'ontic' denotes how agents, always, contribute with embodied participation in collective action. She explains that the ways Yoruba children participate in problem solving is not through quantifying concrete items into abstract number entities as in 'western' logic, but through quantifying matter in relation to their bodies.

Their generalizing attempts proceed with bodily gestures and acts of speaking referring to bodily qualities like thingness or volume. Ontics can be seen as a bodymind coupling that does not aspire completeness, certainty or singularity, but, instead, seeks connectivity and accepts vagueness. As such, ontics is a major part of knowing and becomes a politics of rendering our life commitments visible through embodied performance.

Diverting from a pure epistemological standpoint brings forward also the question of 'who, when, why is constructing knowledge' and urge us to explore knowledge in direct relation to questions of geo-body-political significance (Mignolo, 2009). The body metaphor is already utilized by information technology designers in web interfaces for configuring the screen in relation to how representations and spectators connect to each-other as they navigate the chaotic space of the internet (White, 2006) or locative based media in relation to embodied performances, body presence, sensual and sensing experiences or self/other interactions. For the purposes of our research in the 'street mathematics' project, the notion of body, as the ontic axis, becomes an important issue in coming to terms with knowledge. Primarily, a resort to the body metaphor signifies the urge to move beyond body-mind dichotomies where knowledge is solely located in the individual mind and the body is conceived as a closed container. Secondly, the body signifies the ontic substance of knowledge promoting the importance of encountering embodied performativity. Lastly, the bodymind bond signifies how we best respond to chaos, as well as to inconsistency, uncertainty, complexity and vagueness of life itself and life-worlds. At the same time, it unveils how times of crisis affect our relation, access and abilities to deal with knowledge discourses circulation amongst poor and affluent, haves and have-nots, subalterns and bourgeoisie in urban cityscapes. In all, the resort to body encourages us to think embodied interaction in relation to our flesh, senses and sensibilities but also to how and why our body can or cannot relate with the social space outside the body, but still connected with it, as a matter that matters to our lives and our living environments.

Today, 30 years later, Greece (and Europe) is under an equally severe economic debt crisis, faced by Latin America in the 80s, that affects seriously urban life and challenge modern ways of dealing with knowledge, knowing, knowers and formal learning. The current debt crisis is deeply immersed into a contemporary culture and social life described in cultural flows or networked society terms. Cultural diversity along with ongoing access to open technologies tend to blur and/or reinforce variously borders and boundaries amongst illiterate and literate, poor and affluent, subalterns and bourgeois, south and west, primitive and privileged. Today, we witness the increased complex presence and impact of social media and, in consequence, a rapid medicalization of knowledge, as well as, the growing potentials for hybridizing cityscapes due to locative aware technologies.

Charitos et al (2013) observe how such systems have paved new revolutionary encounters such as the Arab Spring, the Occupy movement, or the anti-austerity demonstrations in southern Europe which, albeit being ephemeral, are '*...both embodied and mediated, and influence community dynamics, giving rise to networks around common interests and collectives of affect*' (p.xv). It is important to delve more into their virtual potentialities and to explore how they might be set to work towards mobilising mathematics education discourses and subjectivities into more sociopolitical routes.

AS A WAY OF CONCLUSION

Lefebvre (1991) invites us to open up the container of any fixed images of a city, a house, or a street and urges us to consider them as '*a complex of mobilities, a nexus of in and out conduits*' (p.92). The urban landscape possesses the elements of a potentially fluid geography that is being reproduced by ongoing movements or '*streams of energy which run in and out of it by every imaginable route*' (p. 93). Our research, as part of a contemporary 'street mathematics' hybrid is geared towards reconfiguring the synergy amongst content, people, space and technologies production -thus opening up the mathematical activity container. Saying this, urban (mathematical) interventions with our student teachers and others aim not only to unravel the mathematical activity but also to re-think our relationship with knowledge and to re-designate its social value and power. In this way, it urges our imagination to experiment with knowledge as epistemic/ontic. Such urban interventions can potentially mobilize multiple cultural presentations of mathematical ideas and make them move, drift and wander with/in the streets of the city.

However, the act of wandering in a city is not neutral. It is a cartography of spatial embodied relations with/in the metropolis where both the 'power of the city' and the 'city of power' need to be encountered as manifolds of social, racial and gendered inequalities. The urban interventions that the hybrid of 'street mathematics' can generate have the potential for exposing diversities and making subtle disruptions of dominant mathematical subjectivities. As such, assembling mathlife chronotopes becomes a place-based laboratory of temporary and deliberate heterogeneous arrangements of sensorial material and immaterial elements. Such assemblage can work, under certain conditions, to further key features of sociopolitical thought in mathematics teacher education. It can hold together an experimental mingling of life-worlds and mathematical creations of affective intensity, especially important for reaching student-teachers. As such, it can serve to unfold bio-political thinking through denoting where is the 'scream', the 'cry', the 'laugh' or the 'smile'.

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