THE SPECIFICITY OF MATHEMATICS LEARNING
AND THE DISAVOWAL OF THE POLITICAL IN RESEARCH

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Abstract

Mathematics education as a field of academic research has been historically concerned with the improvement of the process of teaching and learning mathematics in schools. Despite the diversity of theories used and developed within the field (from cognitivism and constructivism to more recent sociocultural approaches), a focus on ‘learning’ and ‘mathematics’ permeates the way researchers apply and develop different theorizations in mathematics education. In recent years, however, a discontentment with the way research disavows the social and political dimension of ‘learning’ has led the community to search for theories that provide a different conceptualization for the problems of the field. In this article we take advantage of contemporary philosophy to develop an analysis of mathematics education as a field of research. We shall argue that many of the problems related with school mathematics cannot be fully conceptualized without some kind of ‘political mapping’ that situates them not at the level of ‘learning’ but at the political and economical one. Our suggestion is that positing schools as crucial modern institutions for the reproduction of capitalist economy and ideology can bring us closer to the complex situations teachers and students experience in schools.

Key words: Political economy of mathematics education, specificity of learning mathematics, mathematics education research, capitalism.

1. Introduction

The will to provide a quality mathematics education to all people plays a central role in the formation of mathematics education as a scientific field of research. At the beginning of the 1900s, when the Comission International de l’Enseignement Mathematique (CIEM or ICMI) was established, it was clear how the importance of teaching mathematics was conceived of as a social problem. In his review of the extensive work published to commemorate the one hundred years of L’Enseignement Mathématique (Coray, Furinghetti, Gispert, Hodgson, Schubring, 2003), Radford (2004) points that mathematics could no longer be seen as a luxury for elites who managed to climb the highest peaks of education. In pace with the emerging concept of Humanity—men as a coherent rational subject, his own source of meaning, knowledge and action, where civilization was equated
to scientific and technological process—mathematics became a social need, in which the success of the civilized world depended on the inclusion of informed and participative masses. School mathematics in modern, massive educational systems started providing an important element in constituting the rational, cosmopolitan minds of 20th century citizens (Popkewitz, 2009).

In order to satisfy such societal demand, fields of expertise such as mathematics education are called to investigate new ways of assuring mathematical success to all students. In the last three decades, mathematics education research has been growing exponentially, with an array of different highly specialized research topics covering mathematical learning processes, initiatives for change, detailed and in depth studies, comprehensive and interactive studies and data, new teaching strategies, broad studies on the use of technology, and, recently, growing numbers of studies addressing the social and cultural aspects of school mathematics. In spite of all these research efforts, achieving the desirable equitable and quality mathematics education is far from becoming a reality (e.g., Atweh, Graven, Secada & Valero, 2011). Baldino and Cabral (2006) raise the question: “Why do so many people insist in asking for more that which cannot be said to have produced results for change so far?” (p. 21).

We observe that the great majority of mathematics education research, by being primarily focused on pragmatic approaches to the improvement of classroom practice, lacks a theoretical comprehension of how the problems of the field are related with broader social and political structures. Without such strong social and political theorisation, researchers risk moving blindly because we do not “take certain distance and develop consistent research theoretical frameworks to appreciate our practices” (Baldino & Cabral, 2006, p. 31). This concern resonates with calls for developing a more reflexive research: “[i]t appears to be one of the weaknesses of our profession that many of us, myself included, tend to write and speak too much and read and contemplate too little” (Niss, 2007, p. 1311). Despite these appeals, mathematics education researchers seem not to be appreciative of research that is not immediately concerned with action in the sense of providing solutions or strategies for improving the teaching and learning of mathematics. We argue that without a theoretical conceptualization of the role that mathematics education plays within the Political, we run the risk of leaving unaddressed crucial problems standing in the way of an equitable and quality mathematics education. For such openness to happen, discourses defending the specificity of ‘mathematics’ and ‘learning’ as defining characteristics of the field need to be questioned.
In this paper we start by making evident how mathematics education research has been primarily focused on developing optimal learning scenarios for school mathematics, being the focus on learning and the specificity of mathematics invoked as the characteristics which distinguishes it from other fields of research. Such a way of structuring the field will be analysed referring to what the philosopher of education Gert Biesta calls *learnification*, and through Foucault’s concept of *biopolitics*. Afterwards, we take advantage of the recent revival of Marxist theory carried out in contemporary theory by authors such as Slavoj Žižek and Frederic Jameson, in order to read schools as institutions responsible for the reproduction of capitalist ideology and economics. We then explore, from this theoretical perspective, a recent socio-cultural theory for the learning of mathematics. We conclude with a call for opening up the view of which types of theories and of which views on the mathematical specificity can be fruitful for mathematics education research if we would like to grasp the constitution of mathematics education practices in the Political.

2. The specificity of mathematics and learning as disavowal mechanisms

The political dimension of mathematics education has been a growing concern of teachers as well as of researchers. Different trends such as critical mathematics education (e.g., Skovsmose, 1994), ethnomathematics (e.g. Powell & Frankenstein, 1997), discursive approach (e.g., Morgan, 2009), multicultural education (e.g., Planas & Civil, 2002), and post-structuralist studies (e.g., de Freitas, 2004) have presented both inspiration for teaching practices, and an analysis of the way power is implicated in the constitution of the mathematics curriculum and all its associated practices.

In our own work we have built on the literature available in these different trends in order to study the discourses of mathematics education research concerning ‘power’ and the ‘political’ (e.g., Valero, 2008; Pais & Valero, 2011). Our fascination with research has to do with the fact that we conceive of research as an activity that, by examining mathematics education practices in classrooms and schools, generates particular systems of reason (Foucault, 2004) that format what is possible to think about practice. In this sense, mathematics education research is not an innocent activity producing a diagnosis of the state of mathematics education practices or proposing evidence-based solutions to the problems of practice; rather, it is an active participant in shaping, discursively, the possibilities of seeing and inventing practice. Research produces a language, which words and structures format what we as researchers end up saying about the very same world of mathematics education. As Brown (2008b, p. 249) argues, the theoretical and analytic lenses we deploy in our research “comprise particular choices in terms of the analytic filters that we apply,
governed by underlying ideological motivations and trends of which we are not always aware”. For us, a study of the political dimensions of mathematics education, or said in better words, the study of the political constitution of mathematics education has to necessarily cover research and its discourses, and the way in which such discourses contribute to the formation of particular subjectivities in and through mathematics education.

Despite the awareness that school mathematics performs a strong political role, there is a lack of studies that seek to understand school mathematics as part of dominant political and economic systems such as capitalism: “little has been written in mathematics education that addresses how mathematics might play a role in broader politics” (Gutierrez, 2007, p. 38). Neglecting the political dimension, we argue, is connected with two main features of the way mathematics education research as a field of study has been constituted during the 20th century. One has to do with the interpretation of the word ‘education’ in terms of ‘learning’. The other has to do with the specificity of mathematics as defining the borders of what counts as legitimate research in the field.

2.1. Theory as ‘learning’

What is theory and what are its roles in mathematics education research is currently on the agenda of the research community. In recent years a number of groups have worked on this issue and have produced a considerable number of papers¹. An examination of this production has led us to argue elsewhere (Pais, Stentoft & Valero, 2010, forthcoming) that ‘theory’ is taken to refer to ‘learning theory’. Whether adopting sociological or anthropological perspectives, socio-constructivist or radical constructivist perspectives, cognitive science perspectives, all these theories are deployed to study people’s thinking and engagement with mathematical topics and ways of reasoning. The theories help constituting the field as a ‘domain of learning’ (Valero, 2010). The role of theory is understood as providing ‘tools for action’, where action is normally the practice of school mathematics. This approach to theory lacks a deeper theoretical understanding of the concepts involved, by reducing research to a matter of providing the solutions for the problems of practice.

This tendency towards the learnification of education (Biesta, 2005), that is, the reduction of the study of educational phenomena to the study of administrable, engineerable learning processes

¹ See, for example, Cobb (2007) and Silver and Herbst (2007) in the Second handbook on mathematics teaching and learning (Lester, 2007); a survey team at ICME 11; the working group “Different theoretical perspectives and approaches in research in mathematics education” at CERME and their special number in ZDM in 2008; and even the theme of the 33rd PME.
contribute to erase political considerations from educational research. This is part of a larger societal trend where fundamental social problems are addressed as if they were the object of expert management and administration (Foucault, 1991, 1997; Agamben, 1998). Foucault (1991, 1997) shows us that the government of life is achieved through two fundamental technologies that act upon the individual and the population. On the one hand, the technologies of the self refer to the processes of subjectification that force individuals to bind themselves to their own identity, defined by the degree of adherence to social norms. On the other hand, the political techniques or bio-power refer to the way the State assumes and integrates the care of natural life of individuals into its very centre.

As an example of the first, we can think about the mathematical curriculum as a technology of the self. Popkewitz (2004) evidences the mechanisms through which the alchemy of school mathematics constructs a set of learning standards that are closely related to the administration of children rather than with an agenda of mathematical knowledge. This alchemy is carried out by pedagogy. Based on psychology and social psychology, pedagogy generates knowledge about children and how they can effectively appropriate the mathematical content to acquire competences, behaviours and attitudes (e.g., being participative, competent, having self-esteem). In this perspective, school mathematics serves as an alibi to the appropriation of behaviours and modes of thinking and acting that make each child governable. Mathematics education research provides the precise labels and techniques to effectuate the governmentalization of children through school mathematics. The concern of researchers for improving mathematical learning is the fuel for the effective instalment of technologies of the self.

As an example of bio-power, we can mention all the recent emphasis on measuring and evidence based research that reduce fully human beings to numbers representing mathematical performances. The mass scale comparative studies as the Trends in International Mathematics and Science Study (TIMSS) and the OECD Program for International Student Assessment (PISA) represent the most prominent manifestation of this phenomenon. These international, comparative, measurement studies are to an increasing extent brought into the political sphere placing pressure on national governments to regulate their educational systems according to the standards stipulated by those tests (Biesta, 2009; Wilson, 2007). This is what has been happening in the last eight years in very many developed countries where education tends to be transformed, by the pressure of politicians’ demands for accountability, into an evidence-based profession. Consequently, political measures
contribute to formatting teaching and learning of mathematics in a clear and crude way. Teachers tend to tailor their instructional practices to the format of the test, out of the concern that if they design their teaching differently their students will fail. Although they might know all the didactical novelties and methods to promote learning in a meaningful way to the students, they will ‘educate’ their students in the ways the system considers to be legitimate (Wilson, 2007; Lerman, 1998). Research supporting the construction of these systems and their implementation by teachers in classrooms are highly implicated in setting these mechanisms in operation.

The interplay between the two mechanisms of subjectification—techniques of subjective individualization and procedures of objective totalization—creates a twofold political strategy which Foucault (1997) calls bio-politics: the growing inclusion of humans’ natural life (as opposed to their political life) within the mechanisms and calculations of power. In this way politics is made operational. Its purpose is no longer to be a place where alternative emancipatory ways of living together can be thinkable, but to engage in the global regulation for the sake of the species’ biological reproduction. For Agamben (1998), who amplified the work of Foucault, the only real question to be decided is which form of organization would be the most suitable for the task of securing the care, control and use of bare life: human life stripped from its entire political dimension, and reduced to its biological entity. Human bare life is that type of existence that can be measured, calculated and predicted. In other words, it is the object and result of technical expertise. Recognizing this condition, Žižek (2006) argues that today we live in a post-political society: politics have surrendered to specialized social administration, targeting the bare life of the individual by controlling its fluctuations according to global standards of normality.

Just as politics is being replaced by administration, education has given up its place in favour of learning and specialized pedagogy and didactics. In the case of mathematics education research, the discursive construction of students as cognitive subjects and “schizomathematicslearners” (Valero, 2004) is a good example of the way mathematics education research reduces full political and historical human beings to ‘bare learners’, whose cognition can be scrutinized with the interest of devising appropriate and effective techniques for learning mathematics. All the complexity of the social and political life of the student is wiped out from the research focus. The student is reduced to a biological entity, likely to be investigated in a clinical way. With this move, research effectuates bio-power. For example, some researchers find it useful to draw an analogy between mathematics education research and medicine. Mathematics education research is formulated as a
science of treatment that, by understanding the symptoms that characterize students’ learning difficulties in mathematics, aims at designing and applying proper treatments, with the hope of curing what is a defect in students’ learning: “The evolving understanding of the logic of errors has helped support the design of better instructional treatments, in much the same way that the evolving understanding of the logic of diseases has helped the design of better medical treatments” (Silver & Herbst, 2007, p. 63).

To some extent, philosophy offers an alternative to this tendency to ‘technicize’ educational problems. By taking a step back, by resisting the temptation to engage immediately in some form of action, we suggest that sometimes the best way to act is to stop acting, in the sense of doing more of the same research which proved not to have the solutions for the core problems the community faces.

2.2. The mathematical specificity

The adoption of learning theories is also connected with the emphasis on the mathematical specificity of the field. Mathematics education research is defined as the discipline studying “the practice of mathematics teaching and learning at all levels in (and outside) the educational system in which it is embedded” (Sierpinska & Kilpatrick, 1998, p. 29). In this field, “[…] mathematics and its specificities are inherent in the research questions from the outset. One is looking at mathematics learning and one cannot ask these questions outside of mathematics.” (p. 26). Mathematics is usually posited as the “thing” that differentiates mathematics education research from other academic fields. Questions, problems, theories and methods not allowing for mathematical specificity tend to be considered irrelevant, and out of the scope of mathematics education research.

There are two important aspects of this issue. Firstly, mathematics education, as an educational practice is not and can never be specific because it is immersed in the political arena of schooling. Although it seems clear that learning mathematics is different from, for instance, learning music, there are important common educational problems that outweigh the specific problems of any school subject. If the community recognizes that, when dealing with the process of teaching and learning mathematics in schools, there are social and political aspects that influence it, how to address such dimensions? How to develop research which seriously takes them into consideration (instead of a brief mention usually at the beginning or end of articles)? It is difficult to sustain that we can analyse them with the theoretical tools that have been used in mathematics education
research to address the teaching and learning of mathematics. When problems appear that cannot be explained within the theoretical straitjacket of learning—such as, for instance, the institutional framing of schooling which hampers many of the insights for action coming from research, or the exclusionary role of school mathematics within the school credit system—they are, as noted by Gates & Zevenbergen (2009, p. 162), discarded since it is not the responsibility of mathematics education to address such “political” issues. For example, Abreu, Bishop and Presmeg (2002, p. 4), state that changing school mathematics practices “much depends of course on changing the formal educational structures that determine and shape the particular mathematics education practice experienced by the students in their schools”. However, they promptly add that such a task “is beyond the scope of this book”. So the situation is this: although we acknowledge that the problem has an economical and political nature, going way beyond the classroom, the specificity of mathematics is not compromised: we end up investigating as if it could be solved through better mathematics education.

Secondly, the mathematical specificity of the field does not reside in the particular mathematical content, notions or competencies being directly addressed in a research. Rather, its specificity is associated to the privileged role that school mathematics has played in the constitution of particular subjectivities during the 20th century, in a dominant cultural, social and political order. Without an understanding of order, classification, universalism, and objectivism incarnated in the organization of the mathematical rationality in the school mathematics curriculum, the cosmopolitan ‘homeless mind’ necessary for the advancement of the Modern project would not have been possible (Popkewitz, 2009). That we study mathematics-related practices and their relation to the meaning of mathematics education has therefore a social and political significance, even if there is no apparent mathematical content involved (Valero, 2010).

In this way, we suggest that the ‘specificity of mathematics’ has been functioning as the “fantasy-scenario” (Žižek, 2006) that allows keeping a safe distance from confronting the socio-economical roots of the worldwide problem of failure in mathematics. That is, that which allows us to disavow the role school mathematics plays in the Political. It is our contention that the internalism of the field around the learning and the specificity of mathematics make the research produced virtually innocuous if the purpose is to change the current state of affairs of school mathematics.

3. Positing mathematics education within the Political
Important contemporary philosophers, of which Slavoj Žižek is the most boisterous example, have in recent years been developing theory which articulates insights from Lacanian psychoanalysis with a Marxist critique of political economy. In this article we take the standpoint that capitalism, both as ideology and as economy, has become the “concrete universal” (Žižek, 2004) of our historical époque, that is, “while it remains a particular formation, it overdetermines all alternative formations, as well as all noneconomic strata of social life” (p. 3). Thus, every position in education is also at the same time an implicitly or explicitly political stance on the nature of what Jameson (1991) calls “late capitalism”. However, the strength of capitalism, as Žižek (2006) has been exploring through a revitalization of the notion of ideology, resides precisely in the way it presents itself as a non-ideological economical system:

Although it [capitalism] is global, encompassing all worlds, it sustains strict sensu “worldless” ideological constellation, depriving the great majority of people of any meaningful “cognitive mapping”. The universality of capitalism resides in the fact that capitalism is not a name for a “civilization”, for a specific cultural-symbolic world, but the name for a neutral economic-symbolic machine which operates with Asian values as well as with others. (p. 318)

In today’s society capitalism has become the disavowed all-inclusive economical system that ends up subsuming the cultural, social and political spaces of our lives. It has become common sense to argue against the increasing capitalization of the academy, technology, education, media, leisure and, of course, politics, where the logic of the market dictates the, many times invisible, rules to act and be acted in these social spaces. Although we live in a world of multiple social, cultural and political realities, we must ask what, in all these different sets, remains unchangeable? In cultural and social terms, there is no doubt that the world is diverse. European culture and sociability, despite all the similitude, is different from North American culture, as we can easily notice in literature, cinema or philosophy. Not to mention the perhaps even deeper differences between these and Asian and African cultures. Also in political terms, we have around the world all sorts of political organizations: neo-liberal American ideologies, European social-democracy, China’s (capitalized) communism, Arabic religious states, etc. However, when talking about economy, we get stuck. Can we say that we have a plurality of different economical systems around the world? No, the global economical system present in all this multiplicity of cultural and social formations is capitalism. Even communism, whether we are talking about state communism as in China or the

2 Frederic Jameson, Chantal Mouffe, Ernesto Laclau and Alan Badiou are also, each one in his or her own way, good examples.
communist parties that subsist within capitalist democracies, follows the rules of capital. Capitalism dresses in diverse clothes in order to keep reproducing, and no matter how different the “philosophies” of political organization could be around the world (monarchy, socialism, religious fundamentalism, dictatorship, neo-liberalism, etc.) what is common in all of them is that, despite the apparently different “clothes”, the human relations are based on capital. By explicitly mentioning capitalism we want to point to the very core of the problem—this (so often) unaddressed reality that permeates all social relations and for which we seem to have no alternatives.

It is our contention that, if capitalism is the ‘concrete universal’ of our times, colouring our ‘acting in the world’, mathematics education cannot continue without questioning itself, as a field of research, what role it is playing in the reproduction of capitalist economy and ideology. How then shall we address such capitalist overdetermination within mathematics education?

The usual way to understand the relation between schools and capitalism is to conceive education as an increasingly commoditized social space. It is a common place in critical educational studies to assert how education has become merchandise and schools some kind of corporation. For instance, D’Ambrosio (2003) explicitly compares schools with factories, where people are components of big machinery that aims uniformity. In this view, education is conceived as something originally pure that has been progressively contaminated by the capitalistic structure of society. Educational industries, from publishing houses producing text books to computer firms developing technology, see schools as a profitable market; administrators and politicians use the metaphor of schools as companies to envision ways of managing education; governments attribute primordial importance to results in high stake tests as a means to do school evaluation and make grades and scores a matter of profit; demands of the labour market and industries for the production of highly qualified people needed; all these are few examples of such views. In this perspective, education has become capitalized, and the ‘solution’ would be a de-capitalization of education, to return to its original purity, based on humanistic ideas of schools being the place to learn the cultural heritage of humanity, to educating the free man, to help learners’ advancement through formative assessment instead of summative assessment, etc. The purpose is to keep the capitalist logic of production/consumption outside the educational enterprise.

Despite being true, this characterization does not exhaust the relationship between capitalism and education, nor is it the crucial aspect. The problem is that school itself, more than just being contaminated by some capitalistic ideas has in its kernel the capitalist logic. It is against this
background that we should conceive education not as being contaminated by capitalism, or a part of capitalism, but as sustaining the capitalist system itself, by assuring its reproduction. Education is not just a product (education as a piece of profitable market) but a means of (ideological and material) reproduction (Althusser, 1994).

However, this role of school as an ideological apparatus is concealed by means of a ‘naturalization’ of schooling. Capitalist ideology represents school as a neutral environment purged of ideology (Althusser, 1994). Žižek (1994) calls this the ideological function of “self-disguising”: in order to become efficient, ideology must conceal its own ideological assumptions, so that we can be able to act as if our actions were deprived of all ideological content: “the very logic of legitimizing the relation of domination must remain concealed if it is to be effective” (p. 8). We must not perceive ourselves as being interpellated by some big Other but as individual subjects who freely choose to believe and act according to utilitarian and/or hedonistic motivations. For instance, when the NCTM (2000) argues for the importance to educating students to become active participants in society, they disregard any pathetic ideological phrases in sustaining their argument. The argument is either a pragmatic one—we need competent people in mathematics to become the future workers of our high-tech society—or a hedonistic one—people get empowered through mathematics. What we cannot miss here is that this attitude remains an ideological one: it involves a series of ideological presuppositions (e. g. about what it means to be an active citizen in a more and more commoditized society) that are necessary for the reproduction of existing social relations.

One of the few exceptions within mathematics education research to acknowledge the importance of mathematics not as knowledge or competence but as value is the work of Roberto Baldino and Tânia Cabral. They have analysed schools and mathematics education as part of capitalist economy (Baldino, 1998a, 1998b; Baldino & Cabral, 1998, 1999, 2006). Their suggestion is that we should look at school not so much as a place of knowledge but as a place of production, and students’ failure as a necessity. It is because some of us fail, that others can achieve higher social hierarchies. The value of the ones who flunk is appropriated by the ones who pass as surplus value. At school the student learns, above all, to participate in and accept the conditions of production and seizure of surplus value. Failure is posited as a necessary condition for schooling: “in order to perpetuate the process of production/seizure of surplus value, a certain amount of failure is necessary” (Baldino,

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3 In this context, the Lacanian notion of big Other stands for all the State, Justice and Law that give symbolic meaning to our social life.
1998a, p. 5); therefore, “failure of students means success of the institution” (Baldino & Cabral, 2006, p. 34).

However, in order for school to be the most important ideological apparatus, to function as a credit system, as Vinner (1997) noticed more than ten years ago, it is not productive to be presented as an exclusionary institution. This will cause criticism from the whole of society, and will be unbearable from an educational or political point of view. In order to perform well in the role of credit systems, schools need to be presented as inclusionary and emancipatory places. Places where phenomena such as exclusion and failure are seen not as necessary parts of the same system which tries to abolish them, but as contingent problems, malfunctions of an otherwise good system.

Thus, by positing schools in the Political, we are not suggesting a capitalistic metaphor either to better understand education or to help school functioning. We are suggesting that teachers are teaching a basic capitalist practice in their classrooms even if they refuse to recognize it; and students are having the opportunity to learn, besides the specific knowledge the student is supposed to learn (in our case mathematics), the necessary capabilities of a capitalist and a worker (Baldino and Cabral in this issue). Indeed, this should not be surprising since it is precisely what people as Foucault and Bourdieu had been showing in the past: Knowledge in school functions as an alibi to the appropriation of symbolic norms for structuring our lives. And if capitalism is today the neutral matrix organizing our social relations, the conclusion to be drawn is that students in school learn, above all, to participate in and accept the conditions of production and seizure of surplus value.

4. Moving the field towards the Political

In this section we would like to put in operation our analytical tools in doing a political reading of recent socio-cultural theorizations of mathematical learning. The cultural theory of objectification (Radford, 2006a, 2006b, 2008a, 2008b) is arguably one of the most solid and well-documented theorizations about teaching and learning mathematics within a socio-cultural framework. Taking advantage of Vygotsky’s and Leontev’s theories, and also Husserl’s and Pierce’s phenomenological epistemologies, Radford presents learning as the reaching of a culturally-objective piece of knowledge that students acquire through a social process of objectification mediated by signs, language, artefacts, the body, and social interaction as the students engage in cultural forms of reflecting and acting. He deals with the dichotomy of the individual and the object of knowledge by introducing the notion of learning as being, as a dialectical process where learning is both a process of objectification (knowing) and subjectification (being or becoming). Learning is seen as more
than constructing logico-mathematical, mental structures or picking up ready-made knowledge. It is also viewed as an ethical and political activity where the subject is constantly renewed and constructed in the meeting with culture. Learning thus is not just about knowledge but also entangles an ethical and political dimension: “The meanings circulating in the classroom cannot be confined to the interactive dimension that takes place in the class itself; rather they have to be conceptualized according to the context of the historical-cultural dimension” (Radford, 2006b, p. 21, 22).

By doing so, the theory opens the space to address the historical and cultural context, within which the meanings of being a student and a teacher (that is, the social identifications they are subjected to) are constituted. However, when reading analyses of empirical material from classrooms using the theory, the details in the micro-situations under the research gaze seem to leave aside their ‘historical-cultural context’. The historical-cultural dimension seems to get concentrated in the (mathematical) history of the mathematical object being objectified, and in the teacher’s awareness of such constitution to guide the student’s explorations. From the analyses we get the impression that the subject (and his/her historical, cultural, political and social constitution) is thrown out of the equation: what remains is a mathematical learner with the desire to learn mathematics. The usefulness of the theory for presenting a strong interpretation of the ‘learning of mathematics’ seems to force the researcher to ignore all the ‘non-mathematical’ complexities of classrooms which so often stand in the way of a meaningful learning. The result is that learning is portrayed as an encounter between a piece of historic content and a subject who desires to learn it.

But is this the only possible analysis that can be performed with this theory? Our suggestion is that what Radford calls the “meaning circulating in the classroom” should be conceptualized not just as the meaning related with the specific mathematical object, but as involving also an ideological dimension for which neither students nor teachers (and apparently not even researchers) are always aware. As mentioned by Brown (2008b), the point is “not to get at the intention of what the teachers were saying, but rather to understand how the policy was operating through the teachers” (p. 250). That is to say, how ideologies are present and conveyed through students and teachers’ discourse. This is exactly what Baldino and Cabral do in the article they submitted to this special issue. By positing schools in the Political, they open the possibility of conceiving schools not so much as places of learning but places of production, completely entangled by capitalist economics. Doing so, they offer us a different interpretation for many of the learning difficulties they encounter in their
daily work (they both teach mathematics at university), by positing them not at the cognitive or socio-cultural level—that is, at a level where it can be analysed through “theories for learning”—but at the Political. Their suggestion, as we already noticed, is that considering school as a place of economic production may shed light on students’ learning difficulties.

The theory and the analyses called our attention because the theory takes support in Marxism (Presmeg & Radford, 2008), as clearly expressed in Radford and Presmeg’s response to Brown (2008b) in a vivid discussion carried out recently in this journal around the issue of subjectivity. In our view, the construction of a Marxist inspired theory of learning without the full recognition of the political economy that Marx put forward ends up amputated. This disavowing of the economic, as mentioned by Ozselçuk and Madra (2010, p. 333), is in pace with “tendencies within political economy that read Marx in ways that contain and even annul the constitutive negativity of class antagonism”. The cultural theory of objectification, therefore, can be taken to be a historical and cultural framework of mathematical objectification in mathematical learning. But it could be interesting to explore whether it offers possibilities for a broader analysis of the dialectics of objectification and subjectification in the full Political constitution of schooling and the school mathematics curriculum.

In the way we read Marx, there is no emancipation without economic emancipation and, in this sense, as Jameson (1991) argues, the conquest by human beings of the otherwise seemingly blind and natural ‘laws’ of socioeconomic fatality remains the irreplaceable will of Marx’s heritage. Both Žižek and Jameson interpret Marxism not as a political philosophy (although it entangles a practice of politics), but as being primarily concerned with the economic organisation of society and how people cooperate to organize production. Marxism is primarily concerned not with the end of a certain political thought, but with the end of an economical system. This way, by disavowing the fundamental economic dimension of Marxism, a theory such as that of the one discussed above produces a case of what Žižek (1995, p. 9) calls “progressive amnesia”: Marxism is recovered but deprived of its most fundamental core. It is, so to speak, a sanitized Marx. By disavowing the centrality of political economy in Marx’s work—and emphasizing instead the historical and the cultural—, a theory of mathematical learning falls short to bring an understanding of schools as credit systems, and of learning being more than just the acquisition by the student of a piece of cultural-historical mathematical content.

5. Final remarks
If during the venture of opening mathematics education research to theories not primarily concerned with learning for the purpose of designing optimal instructional situations, the specificity of mathematics gets redefined into more blurry issues of mathematical rationality in society, culture, politics and economy—and the same argument could be made for any other school subject—, then for sure we are dealing with a problem that is consubstantial with the constitution of school mathematics in the arena of schooling itself. The teaching and learning of mathematics in classrooms around the world does not occur in an ideal heaven of equal opportunities, where students desire to learn mathematics and teachers to teach it. It happens in schools with all the political charge such institutions have in our current societies. To detach mathematics from the political terrain where it is taught and learned is to produce innocuous research if the researcher’s intention is to envision new educational possibilities.

Such is, in our view, the potential of the research carried out in this article. This kind of research should be read not as research on the teaching and learning of mathematics, but “research on research”. That is, research that, by teasing out other theories—that is, theories which are not primarily concerned with the teaching and learning of mathematics—allow us to ‘estrange’ us from the self-evidence of mathematics education as an established field of research. It is our contention that such an approach, although not directly aimed at providing some kind of insight for action, can help us in redefining the coordinates we use to map and make sense of the problems of the field.

We want to make clear that we are in no ways disavowing the importance of the insights gained by the research in mathematics learning; rather we are insisting that all the research done on better ways to teach and learn mathematics runs the risk of being harmless if schools as credit systems remain unaddressed. It is the fact that schools need to produce failure that colours many of the students’ difficulties usually identified by the community as cognitive or sociocultural impediments. In short, we want to emphasize that a reading of mathematics education practices within the Political economy has an important contribution to make to the field of research.

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7. References


