

IF SCHOOL IS LIKE THIS, THERE IS NOTHING WE CAN DO: SOME THOUGHTS[1]

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Our goal is to share some of our thoughts concerning society, school and mathematics. We try to understand how school mathematics is more related with governance instead of knowledge. The real important thing in school is not to assure the formation of citizens with knowledge, but the formation of citizens that operate in the broad society. Using the Foucault's language, people who will be simultaneously docile and useful. The knowledge, in that sense, is only an alibi to the construction of the desirable subject. Taking that point of view we make some considerations about the role of the teacher and the researcher concerned with social change, trying to highlight the gap between the critique and the struggle to change the reality, which we criticize, in order not just to affirm the capitalist system, but transform it.

SCHOOL AND MATHEMATICS IN SCHOOL: THE KNOWLEDGE AS AN ALIBI

School and Society

The expression “knowledge as an alibi” is not ours. It belongs to Roberto Baldino, a Brazilian researcher. Baldino (1998a) wishes to address to the fact that knowledge appears in school only as an excuse to education. The real important thing in school is not to assure the formation of citizens with knowledge that allow them to be participative agents in society, but the formation of citizens that contribute to the normalized society. Using the Foucault (2004) language, schools form people who will be simultaneously docile and useful. The knowledge, in that sense, is only an alibi to the construction of the desirable subject.

And how is the society in which we live in? Well, it is the capitalist society, described by Marx more than one hundred years ago, and, basically, consists on the fetishes of merchandising and the growing of capital, that originates different huge disparities of richness all around the world, because of the generation of surplus value. Although all the disparities caused by the capitalist system, the strong force of it is the total exclusion of possibility. The capitalist system, since the decline of the Soviet block, as became the only and in our days, the “natural” way of living in society. Because of that, we are losing the imagination to think alternative ways of living. In fact, it has disappeared completely from our official political life all kinds of divergent struggle and, although with some exceptions, it also disappeared the possibility of imagining another way of producing and different ways of living from the one that became hegemonic. It is very common, when we start to criticize the system, at the point where we realized that it is a system that generates poverty,

inequality and huge doses of welfare that feeds apathy, we face the criticism of the question “How could we live in another way?” or even worse, if we sunk ourselves in the critique and realise that is not possible to change the system within the system, we could ended up on imobilism. So, most of the time, like is made in our days by the leftist political wing, we continued to criticize the system, but happily living and, inevitably, perpetuating the capitalist system.

School is part of the capitalist society in which we live in, and, inevitably, although all the changing power that usually are addressed to it, will reproduce that kind of society. Inevitably? Well, we are not sure that school, only by itself, could be a force for the change of society; simply by the fact that school, like other institutions are part of that society. But, by criticizing society and school, we could at least have the honesty to say: as a professor committed to the education of people in a school, I am a hypocrite. But there are ways of going beyond hypocrisy. But those are the ways of struggle.

The role of school

In our days education has became disciplinarized, scholarized, academic-ized. Like mention by Stoer et al. (2001), scholarization has become the only legitimacy modality of thinking education. In school, education is a disciplinary device (Foucault, 2003), which fabricates the individual. Following Foucault is thought, school has became one of the bigger modern disciplinary centres of the body. Obligatory in the modern societies, in school we are introduced to the disciplinary society, via academically recognized knowledge, by the way we submit our bodies and minds to the training devices (it exists in school a huge load of corporal discipline, whether is in the space organization, or in rules as norms about what is considered to be good and bad behaviours). It is in school that the human being, no longer a person but a student, become to understand the hierarchy of behaviours and knowledge, by the means of the creation of classificatory systems that limited them, integrate and exclude them.

Roberto Baldino (1998a, 1998b) has been trying to go further on the task of showing that is in school that the individual learn how to participate in the process of capitalist production. Taking as a starting point the school evaluation system that allowed the selection by means of failure, Baldino shows how in the social practices that occur in school, students, teachers and other employees, they all participate in the transformation of the students is working force, initially poor and without qualification, in a bigger value merchandise, sold by a price that, we all expect, will be greater in the future.

In that way, school is a place where the potentiation of the work force could occur, representing the students in this process the role of the workers (as a social being actively engaged in the process of potentiation) and the role of the capitalists (as owners of a merchandise – its own work force – whose value will increase). The working force will only belong to the student in the end of the course if he or she will

get approved. If not, the work that he or she developed during years of studying will be appropriated by those who get the diploma:

Only those who finish the course and succeed *appropriate* of the work made by all. With their work, students produce a value. Those who fail or abandon the course, even in the last year of it, only get a small fraction of the work they have produced; this incomplete graduation by itself ensures the student a better work. When the student graduates, he/she will assume other structural position as effective owner of the produced value. As it is, he/she appropriates of all the work, inclusively the signification work made by him/her and his/hers colleagues, which also includes those who abandoned. (Baldino, 1998a, p. 8)

School is far from being the place of education. By the contrary, it has developed the function of reducing, dominated and suffocate education, by the ways of reinscribe it on the interior of the state apparatus. Like mentioned before, knowledge in school works as an alibi. An alibi to the formation of the subject needed to the modern society.

The purpose of mathematics in school

In official documents it is easy to understand the four normally explicit arguments that justified the teaching of mathematics in school: because it is useful to the student in his daily life; because is an important cultural heritage that must be preserved; the argument that the study of mathematics develops psychological skills; and final, the most divulgated in the recent years, because it contributes to the development of participative citizens in a socio-political perspective.

All of those arguments are a decoy. It is easy to deconstruct them and show how fragile and incoherent they are, especial the socio-political argument (Pais, 2005). Mathematics appears in school with other surreptitious functions. Let's analyse them by the eye of the foucaultian notion of power.

The first idea to retain is that power constitutes rather than constrains the subject. The relations of power, that are not just hierarchy relations but, above all, microrelations (Foucault, 2004), constitute the subjectivity of the capitalist society. On a basic level, power for Foucault is the capacity that something has to alter the other's conduct. In that sense, school mathematics exercises a power that differentiated them from other school subjects. In a study by Gomes & Queirós (1999), the authors tried to understand in which ways the options of the students are, in most of the cases, determined by the results on mathematics during the schoolarity. As mention in the study, the performance on mathematics has been a decisive criterion to select students, especially in what concerns to access to job marked by its technical or scientifically dimension: "those who have bad results on mathematics will be discourage on taking a career on engineering or a course on sciences. Implicitly, mathematics became decisive on the professional options of many students" (p. 8). Mathematics ended up exercising a power in the sense that takes the students to set on a profession, that will be part of their life, not by motives of willing or

competence, but by a presumable incapacity to have success in a particular school subject.

If, on the one hand, school mathematics influenced the professional choice of the individual, it is not just where it shows its power as a school subject. It is already well documented in studies about the emotional aspects of school mathematics, like for instance the research made by Ilda Couto Lopes (1993) about the affective aspects involve in the school mathematic activity of students, that the failure in that subject is motive of discontentment and disorientation to many students. The bad experiences with mathematics tends to be more traumatic to the student, because he or she feels the importance that mathematics has in curriculum, to his future, and also to his social image (not knowing mathematics is not know how to think rationally).

On the other hand, not to achieve success in mathematics catalogues the student as incompetent, inapt to the demands of a society more and more technological. The numbers of failure demonstrate it, as well as the scholar abandon which every year, in Portugal, sweeps to the dust-bin of social exclusion 15 000 to 17 000 students.

The power of school mathematics is immerse, in the sense that it shapes us to something, formats us, alters our conduct, changes our life aspirations, causes us emotional harassment and familiar conflicts. Mathematics education, as a part of the school system, tried to imbue children in a world that doesn't belong to them, in a world where the valued knowledge is the scientific one, and the exercise of power is a system.

Here we need a very important notion from the work of Foucault. School mathematics acts like a device that makes behaviour elements to be reinforced or punished, as they adhere to the rule or note. Or, using Foucault's terminology, like a normalization device. As said by Popkewitz (2002), who takes into account the work of Foucault on education:

[the mathematical curriculum] is an inscription devise that makes the child legible and administrable. The mathematics curriculum embodies rules and standards of reason that order how judgments are made, conclusions drawn, rectification proposed, and the fields of existence made manageable and predictable. (p. 36)

From these lines emerge another purpose for mathematics' teaching. An implicit and tolerated argument but, by that, very powerful: teaching mathematics to approximate the student to the norm, to normalize, by putting in motion mechanisms that penetrated the bodies, the gesture and the behaviour. Normalizing is associated with the governance of the people, by "controlling their multiplicities, use them at maximum, maximizing the utility of their work and activity, thanks to a system of power susceptible of control them" (Foucault, 2004, p. 105). Basically, "making grow at the same time the docility and the utility of all elements of the system" (p. 180).

AND NOW? WHAT CAN WE DO AS TEACHERS AND AS RESEARCHERS?

The example we will describe next is paradigmatic on many researchers on mathematics education. Basically, it consists on knowing and admitting that the big problem of scholar mathematics' failure lies outside the didactic of mathematics, understood as the research for theory or tools for better teaching and learning mathematics, and, paradoxically, continuing to research only the didactic or psychological aspects of school mathematics.

In the last ten years in Portugal the debate about mathematics education has been very inflamed, due to the shock between different ways of understanding education and the role of mathematics in school. In a country where the failure in mathematics is very severe, several ideas about how to surpass this crisis have been flourish in the last years, most of them impregnated on ideology, and conveying conservative measures like an increase of examination, a focus on pure mathematics contents, and a more authoritarian power to the teacher in the classroom. Those measures are not taking into account considerations about the predisposition of students to learn mathematics, or other social aspects of mathematics learning. It is just taken for granted that all students will naturally learn mathematics if the curriculum is good, and the teacher efficient.

Many mathematics educators have criticize this ideas, and, based on decades of mathematics education research, made a much more lucid and complete analyse of the problem. Taking as example João Pedro da Ponte, one of the most prominent math educators in Portugal, he developed a very exhaustive description of the problem of the failure in mathematics and its causes. In one sentence he resume what he thinks it is the reason why mathematics is a discipline condemned to failure:

The fundamental reason why we have failure on mathematics is because this discipline is socially conceived precisely to lead to failure. It is a result of the function that is attributed to mathematics in the educative system and interiorized by all the intervenient in the learning process. In truth, the big role of mathematics is to serve as a selection instrument of students. (1994, p. 5)

In another text, Ponte (2003) pointed out the «crisis» in society as the first cause for the failure. Doing that, Ponte take into consideration all the social and political dimension involved in the problem of failure in school mathematics, showing a more deep knowledge of the problem. However, when, in the same text, Ponte pointed the possible resolutions to the causes he identified for the failure none of them focus on the so call «crisis in society», neither in the fact that, like he said, failure in mathematics is a result of the mathematics' function in school.

That happens because Ponte assumes that the problems that most of the teachers feel related to the failure of the students on mathematics are not problems that can be put on the field of mathematics education research. By this way, we have teachers feeling the problems, and also researchers describing the problem as something “social” or

“political”, and simultaneously are forbidden to think or research about them. At least, in the mathematics education field.

The idea is that, although we have knowledge of the importance of the social context, that is often characterized as being on crisis, it is not taken into account in the mathematics education research, because it is not specific of that field. In that way, the analysis of the social situation that are identified as problematic is excluded from the research. Because of this, a lot of the scientific results on math education are results made to an abstract society, that convey the idea that if the crisis in the society will be solved, then those are the results that will allow us to achieve the success on mathematics. But who will solve this crisis if not us that identified society has being in crisis?[2]

The assumption that the social and political issues that influenced the mathematics' teaching should remain outside the mathematics education's research, because that is not their vocation, it is related with the process of specialization characteristic of modern science, and the will to delimitate the field of investigation, in order to be able to achieve the status of scientific area (Pais, 2005). With the specialization becomes difficult to the scientist to understand the several problems that worried people on a global and local level. Paulo Freire (1998), describes very well the way in which a scientist specialized on a given area loses his capacity of thinking in broader ways:

Distinct from specialities, to which we are not opposed, specialisms narrow the area of knowledge in such a way that the so-called “specialists” become generally incapable of thinking. Because they have lost the vision of the whole which their “specialty” is only one dimension, they cannot even think correctly in the area of their specialization. (p. 516)

Also Baldino(1998a)

Maybe they say that Mathematics Education cannot, because its lack of tools, open certain questions that are seen as being of the field of sociology. This argument is, at least, curious, because it supposes that those “certain questions” are present in the classroom, and doing so admitting that the teacher is effectively dealing with them, simultaneously, preach that he cannot think them, or refer to them. That makes us think that, maybe, the obliteration of discussion are taking care in order to allow the teacher to exercise some particular solution of that questions, with more efficacy as less he knows what to do. (p. 5)

From here it follows that is convenient to the system that the teacher continued to effectively teach their classes, investing more and more in their didactic formation and the researcher to continue to investigate problems and strategies to improve the mathematics teaching and learning. The fact that society is in crisis, or the feeling that the problems of failure in mathematics are situated in another sphere, are not part of the practice or research. That desresponsability, by one side, absolve the teacher

and the researcher and, by other side, guarantee the absence of critique inside the system.

We must understand that is favourable to our society that the teacher recognize himself as someone who is concerned with the development of the capitalist society, than, on the opposite, like someone who supports that society. It would be unbearable if the teacher understands himself as someone responsible for the state of the same society that he criticizes. So, understand himself as an element that personally criticizes the capitalist society and exercising in their daily work what he thinks will make the difference, it turns out integrating the big capitalist machinery. His work, as a teacher, has taken place already conditioned by a set of disciplinary mechanisms, which shape it in order to maintain the system moving. His work happens on an episteme (Foucault, 2002), or under the effect of a system of reason that will conduct not to the transformation of the system, but to its affirmation.

SOME WORDS

Firstly, let us researchers concern with social change, do our research on what we consider to be the core of the problem: the capitalist system. By studying mathematics and school mathematics under the light of the broad capitalist society, with its discourses and mechanisms, we could develop a critique on how scholar mathematics is so implicit in that system that any possibility of local change is rapidly and tacitly rejected or “phagocyted” by the system. Secondly, as teachers, if we want to make a difference and put an end to our hypocrisy, we have to struggle. Struggle in the classroom, struggle in the school, in the community and with the state. Just because being critical and being a teacher, in our days, is a contradictory task.

NOTES

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2. If all researchers act this way, they are an innocuous piece on social change. This is to say that our work as researchers is not changing the world, but just to identify a problem in a specific field scenario and studied it. Ubiratan D’Ambrosio and Paulo Freire said the opposite, that our work as researchers is subordinated to a higher goal.

REFERENCES

- Baldino, R. (1998a). Assimilação Solidária: escola, mais-valia e consciência cínica. *Educação em Foco*, vol. 3, n.º1 Mar/Ago, pp. 39-65. Editora da Universidade Federal e Juiz de Fora, MG.
- Baldino, R. (1998b). School and surplus-value: contribution from a Third-World country. *Proceedings of the First International Conference on Mathematics Education and Society*. Nottingham: Centre for the Study of Mathematics Education.

- Foucault, M. (2002). *Arqueologia do Saber* (6ª ed.). Editora Forense Universitária. São Paulo.
- Foucault, M. (2003). *Vigiar e punir*. (27ª ed.). Petrópolis: Editora Vozes.
- Foucault, M. (2004). *Microfísica do Poder* (20ª ed.). Rio de Janeiro: Edições Graal.
- Freire, P. (1998). Cultural Action for Freedom. *Harvard Educational Review*, 68 (4), 471-521.
- Gomes, P. & Queirós, A. (1999). Insucesso no ensino-aprendizagem da matemática: efeitos nas opções vocacionais dos alunos. *Revista do Instituto Nacional de Estatística*, Vol. 3, 3º quadrimestre, pp. 7-45.
- Lopes, I. C. (1993). *Aspectos afectivos da actividade matemática escolar dos alunos*. (tese de mestrado). Lisboa: Associação de Professores de Matemática.
- Pais, A. (2005). *Uma abordagem crítica das relações entre sociedade, ciência e matemática num contexto educacional* (tese de mestrado). Lisboa: DEFCUL.
- Ponte, J. P. (1994). Uma disciplina condenada ao insucesso? *NOESIS*, 32, 24-26.
- Ponte, J. P. (2003). O ensino da Matemática em Portugal: Uma prioridade educativa? *O ensino da Matemática: Situação e perspectivas* (pp. 21-56). Lisboa: Conselho Nacional de Educação.
- Popkewitz, T. S. (2002). Whose heaven and whose redemption? The alchemy of the mathematics curriculum to save. *Proceedings of the Third International Mathematics Education and Society Conference*. (pp.34-57). Aalborg: Centre for Research in Learning Mathematics.
- Stoer, S. et al. (2001). *Transnacionalização da Educação: Da crise da Educação à «Educação» da Crise*. Porto: Afrontamento.