

Two political facets of Mathematics Education in the production of social exclusion ¹

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This paper discusses some of the cultural, social and political dimensions of the field of Mathematics Education. The theme is analyzed based on two facets, which, although maintaining their specificities, are articulated. The first one refers to social processes connected to Education, which end by excluding large population groups from access to mathematical knowledge, in an operation that contributes to social exclusion. The second facet of analysis refers to the politics of knowledge. Here are discussed processes which render “naturalized” and invisible the power relations which make specific subjects be considered legitimate as part of the school Mathematics curriculum. The effects of these processes are also analyzed.

Introduction

Paulo Freire, in the language of his time, stated, in his book “Pedagogy of the Oppressed”, that Education had a political dimension. Later, he himself reformulated that first statement he had made, saying that Education is political. Freirian thinking, in particular its emphasis on the politicity of Education and the centrality of cultural and social aspects in the educational act, in its time had a major impact on the peripheral countries and also on the central ones, an impact that, possibly, gradually also reached the area of Mathematics Education. Today, decades after the initial ideas presented by Freire, we are examining the politicity of Mathematics Education with other theoretical perspectives. This is also because the world now has different economic, social and political designs that shape these times of globalization, marked by large numbers of poor crossing borders, producing culturally plural and socially even more unequal scenarios. There are many questions that we, in these Neoliberal times, have to ask ourselves as Mathematics educators, committed to building a world with greater social justice.

The theme of this article: “Two political facets of Mathematics Education in the production of social exclusion” is aimed at analyzing some of these issues. The analysis has two facets which, maintaining their specificities, are articulated. The first facet concerns the social processes connected to Education, which end up by excluding large portions of the population from access to Mathematics knowledge, contributing to social exclusion. In a country like Brazil, where, according to data disseminated recently by the United Nations Program for Development (FSP, 05072001, p. A8), the 10% wealthiest own almost half the national income and the poorest 10% have only 1% of this income, the educational dimension is only one of the many that make up this

¹ This paper is a modified version of Knijnik (forthcoming).

serious picture of social exclusion. The second facet of the analysis refers to the politics of knowledge, in which are discussed the processes that render naturalized and invisible the power relations that make some contents be considered legitimate to integrate the school Mathematics curriculum.

Mathematics Education and social exclusion

This section is dedicated to the discussion of the first analytic facet, mentioned above, which deals with the social processes that end up by excluding from access to knowledge large portions of the population, those that are, often inappropriately, called minorities. In order to develop my arguments, I sought inspiration in the book that was recently published in the USA, written by Bob Moses, together with Charles Cobb (Moses & Cobb, 2001): “Radical Equations: Math Literacy and Civil Rights”. Bob Moses, together with Martin Luther King, Edla Baker and others, in the 1960s, led the struggle for the black population’s right to vote, in the south of the United States. Many of us recall, from the films we saw, from the books we read, the heavy racial segregation present during that period of the United States’ history, a segregation that, in current times, gained other forms, which are certainly less severe but are still maintained, not only in the north, but also in the south of the American continent.² Forty years later, Bob Moses writes this book, a passionate testimony regarding the difficulties and challenges of those times of organizing the poor and black United States communities, he relates this part of U.S. history to the movement that he now leads in the United States – the Algebra Project – a network of Mathematics Education programs in 25 cities, involving over forty thousand students in the urban and rural areas. The central argument presented by Bob Moses is that that the struggle for the political access of black communities in the south of the United States, during the 1960s, today takes on another dimension, concentrating on what he calls the economic access of these socially marginalized populations.³ In a time marked by rapid, profound technological innovations, Bob Moses uses data from the Department of Labor of his country in order to show that, currently, in the USA, 70% of all the jobs require

² The book “Etnomatemática: uma experiência educacional”(Halmenschlager,2001) discusses some issues of racial discrimination in its relationship with Mathematics Education.

³ Without disagreeing about the importance of mathematics literacy as one of the instruments for access to the more highly qualified jobs, i.e., for the economic access that Bob Moses speaks about, I find it essential, for this discussion, to present an argument advocated by Marilyn Frankenstein and Arthur Powell (personal communication), when, on analyzing issues of discrimination in the USA, they state that the Afro-American populations are discriminated against in the world of labor, not because they do not have the necessary competencies to take up more qualified, and consequently, better paid jobs. It is precisely the opposite: these populations do not have access to such jobs due to the racial discrimination processes that exist in the United States society. This is the reverse of the argument presented by Bob Moses.

technological literacy; around the year 2010, all jobs will require technical skills, and further, that, as yet, we do not even know what these 80% of future jobs will be (Moses, 2001:9). Faced with these data, he asks:

Who's going to gain access to the new technology? Who's going to control it? What do we have to demand of the educational system to prepare for the new technological era? What opportunities will be available for our children? These are questions that ultimately challenge power as the civil rights movement did, for that earlier movement was about more than lunch counters and ballots (Moses, 2001:22)

According to Bob Moses (2001: 11), “new technology demands a new literacy – higher math skills for everyone”. He acknowledges that:

Math illiteracy is not unique to Blacks the way the denial of the right to vote in Mississippi was. But it affects Blacks and other minorities much, much more intensely, making them the designated serfs of the information age just as the people that we worked with in the 1060s on the plantations were Mississippi's serfs then.

Supported by this argument, Moses presents mathematical literacy and economic access as the foci of interest of the Algebra Project, defined by him (Moses, 2001:17) as a cultural struggle.⁴

I would add to the thinking of Bob Moses, another dimension on this theme of new technologies and changes in the work world, which I consider equally important for the field of education. This is a matter of problematizing and critically examining these technologies, asking ourselves how they are being used, what interests have guided the research that gives them support, what portions of the population have benefited from such technologies, in terms of quality of life. I argue about the importance of looking critically at what has been named “technological advances”, not with a position of looking back with regret, to return to a past marked by manual labor, but that we avoid the glorification of such advances, not taking a naïve position in relation to the vast web of interests that guide their production and dissemination.

The history of the Algebra Project is already closely connected with the history of democratic struggles in the United States, and it is in tune with the struggles for a more egalitarian society, which currently are developed in many and different scenarios of this planet, taking on many and different forms. What we must ask is what is the contribution we, Mathematics educators, in the daily work of our classrooms, in our research and to university activities with social movements and school systems, can give these processes, so that this contribution will be consistent with other dimensions of our participation in the

⁴ On the topic of new technologies in their relationship with Mathematics Education in Brazil, it is important to mention the studies developed by Janet Frant, based on her PhD thesis (Frant, 1993), and the investigations developed by the “Research Group in Computer Science, other Medias and Mathematics Education” of UNESP/Rio Claro, coordinated by Marcelo Borba (Borba, 1999; Borba & Penteadó, 2001).

broader social world as citizens. One of these contributions was indicated by Bob Moses, when he speaks of access to mathematical literacy; another contribution, I mentioned above, when I referred to the need to be suspicious of this discourse which is usually not problematized, regarding the new technologies and advances fostered by them. A third contribution would be to think more carefully about the evaluation processes that we have used in our school activities, and also in the evaluation processes present in the national elementary, secondary and university-level exams currently held, for instance, in countries like Brazil.

As Fernando Alvarez-Uria (1996:39) writes:

The exam, taking as a justification the evaluation of knowledge, actually establishes a hierarchy of individuals, contributes to shape personalities, ranks the students; in brief, it destroys the very possibility of collective work in a cooperative regime, since it was created as an instrument to distinguish, separate and, exclude. The exam introduces the logic of “paddle your own canoe”, but, with the particularity that when one is dealing with a closed, strongly coded world, there is no possible escape. Each individual will be classified perfectly on a scale ranging from “the place of honor” to the “group of the incapable”.

It is, therefore, a challenge to all of us to create other possibilities to follow up the work that we develop with the students, a follow-up organized in order to be able to help in the continued process of acquisition of knowledge and which constitutes a mechanism of education that, instead of separating, dividing, classifying, hierarchizing people, will favor attitudes of cooperation.⁵

Mathematics Education and the politics of knowledge

Bob Moses’ book, mentioned above, begins and ends with a quotation from Ella Baker. This leader of the Black movement in the United States says:

In order for us as poor and oppressed to become a part or a society that is meaningful, the system under which we now exist has to be radically changed. This means that we are going to have to learn to think in radical terms. I use the term radical in its original meaning – getting down to and understanding the root cause. It means facing a system that does not lend itself to our needs and devising means by which you change that system. That is easier said than done. But one of the things that has to be faced is, in the process of wanting to change that system, how much have we got to do to find out who we are, where we have come from and where we are going... I am saying as you must say, too, that in order to see where we are going, we not only must *remember* where we have been, but we must *understand* where we have been.

From this quotation, that certainly gives rise to different anchorages, I choose the final part to anchor my analysis on the second analytic axis of this article, that is centered on the politics of knowledge, as related to Mathematics

⁵ The studies by Robert Baldino (BALDINO, 1998a, 1998b) on the evaluative processes that counter the prevailing dominant models have been a relevant contribution to the discussion on this theme.

Education. When Ella Baker said to her fellow anti-racist fighters of southern Mississippi that in order to know what paths to take, they had to not only remember their past, but to *understand* it, she showed the importance, for the struggle that was being waged then, of the recovery of traditions, culture, ways of living and signifying the world of those social groups. Since that time, the 1960s, as Paulo Freire stressed, and some time later Ubiratan D' Ambrosio, Education began to pay attention to such recoveries, understanding their relevance in the pedagogical processes that would be beyond the mere transmission of hegemonic knowledges, those that have usually been called "knowledges accumulated by humankind".

The recovery of the past history and the present history of the non-hegemonic groups is one of the central ideas of the discussion that has taken place, contemporarily, around the politics of knowledge. It is necessary to problematize the politics of dominant knowledge, through what Ali Behdad (1993:43) calls "wild" practices that, for him, "have been in general counter-systemic, contestatory and antidisciplinary". To Behdad (1993:43), one of the authors who have been involved in the Post-Colonialist curriculum theories, "the problematic and politics of postcolonial conditions demand a counter-disciplinary mode of knowledge that undermines the social, political and economic reasons behind the principle of compartmentalization". I would add to this compartmentalization, which transforms Mathematics, History, Geography, Science and Language classes into incommunicable compartments, another dimension of these "wild" practices. I argue about the importance that such practices undermine also the social and political reasons that, in the school curriculum, underlie the invisibility of the cultures on the non-hegemonic groups that include their own ways of dealing mathematically with the world.

An issue that should be stressed here is the relevance of the problematization of these questions for the school curriculum. Its justification is founded on the argument presented by authors such as Tomaz Tadeu da Silva (1999:15), who shows that when we ask ourselves which curriculum should be implemented, why this and not that other set of activities, knowledges, practices, we are saying what we wish our students to become as persons, and this is directly connected to the idea of what type of society we wish to build. Therefore, it is a question of making choices that are eminently ethical and political. This is precisely why the curriculum studies, also in the field of Mathematics Education, involve the discussion of connections between culture, science and knowledge.

How have we been thinking about such connections? One of the ideas that we have certainly rejected is that knowledge, culture and curriculum are neutral, aseptic, finished products that exist without any connection to the injunctions of the social world. On the contrary of this essentialist view, we think that culture, knowledge, science and curriculum are historical and social constructions, and thus a field of conflict and struggle, a struggle marked by power relations. As

educators, we are directly involved in the dispute to define what knowledges, what values, what principles we consider legitimate to be part of the school curriculum. However, in order to think about the choices that we make today – yes, indeed, they are choices – we must seek to understand how, historically, a set of knowledges, values and principles became hegemonic, how we became what we are, to recall Ella Baker once again. And it is also necessary to understand how so many other knowledges, values and principles were gradually excluded from the school curriculum. These processes of inclusion and exclusion were produced and did produce power relations, as today including or excluding knowledges is a product and producer of power relations.

In the times we live in, where, as I indicated above, people, objects and cultures migrate, the curriculum theories are closely connected to issues of multiculturalism and difference. Not to an essentialist idea of difference, nor a celebration of diversity, a word that may be a trap, because it may naturalize what is, in fact, socially constructed. Nor is it a question of “solving” the issues of multiculturalism, and difference in the curriculum, seeking to present these “others” – for instance the African peoples, peasants and indigenous peoples – in a distant and superficial form, as “exotic”, as though making a concession to culture, science and hegemonic knowledges that would then be permitting this “meddling”, as long as the meddlers would stay on the border, on the sidelines. That is not what it is about. As Silva (2000:101) writes:

In a sense, “pedagogy” means precisely “difference”: educating means to introduce the wedge of difference into a world that, without it, would be limited to reproducing the same and the identical things, a world that stands still, a dead world. It is about this possibility of opening to another world that we can think of in pedagogy as difference.

These are the challenges that have inspired the research activities that I have been developing for 10 years, taking as an empirical field the Education developed by the Brazilian Landless Movement, in particular its Mathematics Education. The theoretical perspective that I have sought to problematize is in accordance with the issues contemporarily faced by Ethnomathematics (D’Ambrosio, 2001; Frankenstein & Powell, 1997). It can be summarized as:

the investigation of the traditions, practices and mathematical concepts of a subordinated social group and the pedagogical work which was developed in order for the group to be able to interpret and decode its knowledge; to acquire the knowledge produced by academic Mathematics; and to establish comparisons between its knowledge and academic knowledge, thus being able to analyse the power relations involved in the use of both these kinds of knowledge (Knijnik, 2000).

In assuming this ethnomathematics approach, I argue about the importance of providing visibility to those knowledges that are usually not discussed in the school curriculum - what I have called Popular Mathematics – placing them in interlocution with the knowledges legitimated in our society as the scientific knowledges - those so-called Mathematics. I stress that we must be very careful

not to glorify either the popular knowledges or the academic ones, which means to problematize them, analyzing the power relations involved in the use of these different knowledges (Knijnik, 1996). To guide the school curriculum in this direction would be, to use the words of Behdad, an attempt to produce “wild” practices, which could produce less perverse effects for the excluded, for the so-called minorities, for those who do not have their culture, their life, represented in the school program, which includes their ways of dealing mathematically with the world. *Who* is represented in the curriculum, and even more, *how* they are represented can make a difference in the social inclusion processes. It is in this dimension that the problematization of the politics of knowledge and the issues of social exclusion – the two analytic axes that guided this paper – are articulated. Differently from the perspective adopted by Bob Moses in the Algebra Project that does not incorporate in the pedagogical work nor question the theme of politics of knowledge I argue for the relevance of this articulation. For us, mathematics educators, to take this into account constitutes one among many perspectives that could enable our educational work to contribute to a more solidary and just world.

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