# Brazilian peasant mathematics, school mathematics and adult education

**Gelsa Knijnik**

Universidade do Vale do Rio dos Sinos, Brazil
<gelsak@unisinos.br>

## Abstract

The paper analyzes adult mathematics education from a cultural perspective. Specifically, its purpose is to broaden our comprehension about this field of knowledge using as a theoretical tool-box an Ethnomathematics perspective founded on post-modern thought, post-structuralism theorizations and Wittgenstein's work developed in his book *Philosophical Investigations*. This Ethnomathematics perspective allows us to study the Eurocentric discourses that constitute academic mathematics and school mathematics; to analyze the effects of truth produced by the discourses of academic mathematics and school mathematics; to discuss issues of difference in mathematics education, considering the centrality of culture and the power relations that institute it; and to problematize the dichotomy between 'high' culture and 'low' culture in mathematics education. Taking elements of the empirical data produced in many years of fieldwork with peasants of the Brazilian Landless Movement who participate in adult education courses as students or as teachers, the paper discusses some aspects of this social movement, especially the educational work they are developing; it outlines the theoretical background that supports the idea that there are different mathematics; it presents and analyzes some elements of the mathematics produced by the Landless peasant form of life, establishing relations with school mathematics, problematizing curricular issues of adult mathematics education.

Key words: ethnomathematics; different mathematics; culture and mathematics education; peasant adult mathematics education.

## Introduction

This paper analyzes adult mathematics education from a cultural perspective. More specifically, its purpose is to enlarge our comprehension about this field of knowledge using as a theoretical tool-box an Ethnomathematics perspective founded on post-modern thought and post-structuralism theorizations, mainly Foucault's work (2002, 2003).[1] Moreover, the ideas discussed in the paper are rooted in what I have been learning with peasants of the Brazilian Landless Movement who participate in adult education courses as students or as teachers. They inspire my academic life and provide the empirical data as well as the guidelines for the ideas I

[1] In considering the Ethnomathematics' perspective as a theoretical tool-boxI am following Gilles Deleuze who argues that "a theory is exactly like a box of tools. It has nothing to do with the signifier. It must be useful. It must function. And not for itself. (...). We don't revise a theory, but construct new ones (...). A theory does not totalize; it is an instrument for multiplication and it also multiplies itself.(Bouchard, 1977, p. 208)

present here[2]. Such ideas have as their kernel the discussion about the uses of different mathematics in adult mathematics curriculum, which will be developed in the next sections of the paper. The first gives a glimpse of some aspects of Landless Movement, especially the educational work they are improving. The second section outlines the theoretical background that supports the idea that there are different mathematics and the third presents empirical data that show two different mathematics: one mathematics produced by a 'form of life' found in Landless peasant culture and another mathematics produced by a 'form of life' found in school culture.

## Setting the scene: Brazilian Landless Movement and its struggle for land and education

Hardt and Negri (2000) begin their well-known book *Empire*, saying that "it is materializing before our very eyes (...) [since] we have witnessed an irresistible and irreversible globalization of economic and cultural exchanges" (p. 11) which instituted "a global order, a new logic and structure of rule – in short, a new form of sovereignty. Empire is the political object that effectively regulates these global exchanges, the sovereign power that governs the world." (p. 11). This new imperial order is taken as a background to this paper, considering the importance of attempting to understand adult education as a field of knowledge as well as the contemporary social movements and their educational processes within this new world configuration characterized by the "absence of boundaries", in which "the rule of the Empire operates on all registers of the social order, extending down to the depths of the social world" (Hardt & Negri, 2000, p. 15).

Among the many struggles of social movements that could be analyzed in their relationship with education, especially mathematics education, we can situate the struggles for land reform carried out by the Brazilian Landless Movement. This movement is well known in the international scene mainly due to the 'new' aspects it has brought to education, as written in the official Movimento Sem Terra's (MST, 2003) website:

> Landless Movement, in Portuguese, Movimento Sem Terra (MST) is the largest social movement in Latin America with an estimated 1.5 million landless members organized in 23 out of 27 states. The Landless Movement carries out long-overdue land reform in a country where less than 3% of the population owns two-thirds of the land on which crops could be grown. Since 1985, the MST has occupied unused land where they have established cooperative farms, constructed houses, schools for children and adults and clinics, promoted indigenous cultures and a healthy and sustainable environment and gender equality. The MST has won land titles for more than 250,000 families in 1,600 settlements as a result of MST actions, and 200,000 encamped families currently await government recognition. Land occupations are rooted in the Brazilian Constitution, which says land that remains unproductive should be used for a larger social function.

The educational process that has been developed by the MST over its 22-year history must be understood beyond schooling, since each landless subject educates her/himself through her/his participation in the everyday life of their communities and through a wide range of political activities developed by the Movement. This means that the children, youth and adult peasants are educated by the multiple facets of the struggle for land, which produce very specific social identities. Nevertheless, these social identities do not form something compact, uniform, in which hundreds of family from different social strata become a unified whole, homogenized by the struggle for land.

[2] This paper is an extended version of the plenary talk given at the 13rd Adult Learning Mathematics Conference (Belfast, 2006).

To look at this social movement through such lenses implies that if there is some kind of intention of establishing a 'landless identity'. But in their educational processes there is a sort of rebellion against fixing *one* social identity. In summary, the landless educate themselves in the struggle - in the occupations, the marches, in their ways of organizing the settlements, through their cultural artefacts – learning the many possible meanings of 'being landless'. There are many axes – such as those of gender, sexuality, ethnicity –- which in their crossovers ultimately shape multiple landless identities, multiple ways of giving meaning to the struggle for land. In summary, it can be said that the peasant culture of the Brazilian Landless Movement is marked by difference.

The schooling activities developed by the Landless Movement cover child education, elementary and high school education, teacher training courses and projects of education of youths and adults. As shown in the MST website, the Landless Movement Schooling Project involves 1800 schools in camps or settlements (grade 1 to 8), with 160 thousand students and 3900 teachers; 250 educators who work with children up to 6 years; 3000 educators working with 30 thousand peasants of literacy and numeracy projects of adult education; and teacher training courses implemented in partnership with public and private universities around the country.

This schooling project, according to one of the Landless Movement official documents, sees the need for

> two articulated struggles: to extend the right to education and schooling in the rural area; and to construct a school that is in the rural area, but that also belongs to the rural area: a school that is politically and pedagogically connected to the history, culture, social and human causes of the subjects of the rural area (Kolling, Cerioli & Caldart, 2002, p. 19).

The movement has dedicated itself to conceiving the schooling of its children, youths and adults paying attention to these two struggles. Such struggles contribute to the guidelines for its adult mathematics education using the peasant culture as a key issue to the teaching and learning processes related to mathematics. However, reference to this valorisation does not deny the relevance of acquiring mathematical tools connected to academic mathematics that can improve the uses of new technologies for managing the production in rural areas and can allow the adult learners to go further in their schooling trajectory. As it will shown in the next section, these ideas are strongly connected to the field of Ethnomathematics.

## Ethnomathematics as a theoretical tool-box

In its mathematics education trajectory the Landless Movement has been inspired by Ethnomathematics ideas, which were first proposed by Ubiratan D'Ambrosio, in the 1970s (1991, 2001), at a time when issues concerning culture began to be strongly considered in Latin American People Education, as conceived by the Brazilian educator Paulo Freire. Since then Ethnomathematics has become a broad, heterogeneous field of knowledge. The work done with peasant social movements in the Brazil (Knijnik, 2002, 2005, 2006) contributes to our understanding of the landless adult mathematics education and allows us to view Ethnomathematics field through a new lens. But how can one describe this new lens? and what theoretical perspectives support them?

To answer such questions we must consider post-modern thinking, as enunciated by authors like Bauman (1997), and post-structuralist theories, specifically the work of Foucault (2001, 2003) and Wittgenstein (2004). In considering a post-modern perspective, I follow authors like Veiga-

Neto, when he says that it "rejects a totalized thinking, the illuminist meta-narratives, the universal referentials, the transcendencies and essences, that, imploding modern Reason, leave it in the shards of regional rationalities, of particular reasons" (Veiga-Neto, 1998, p. 145). It is these "shards of regional rationalities, of particular reasons", that occur in the mathematics used within the peasant cultures of Brazil, that are of concern to Ethnomathematics. Post structuralism, on the other hand, contributes to the Ethnomathematical perspective with its "aims to expose structures of dominations by diagnosing 'power/knowledge' relations and their manifestations in our classifications, examinations, practices and institutions. It aims to produce an 'incredulity towards meta-narratives', to disassemble the structures, the 'moves' and strategies of official discourse" (Peters & Burbules, 2004, p. 5). These aims were the productive inspiration for the Ethnomathematical perspective presented in my more recent studies (Knijnik, 2004, 2005, 2006), when I said that

> it allows us to study the Eurocentric discourses which constitute academic mathematics and school mathematics; to analyze the effects of truth produced by the discourses of academic mathematics and school mathematics; to discuss issues of difference in mathematics education, considering the centrality of culture and the power relations that institute it; and to problematize the dichotomy between "high" culture and "low" culture in mathematics education (Knijnik 2006, p. 121).

This Ethnomathematical perspective assigns a central role to the notion of culture. It is seen as a human production, which is neither fixed, determined nor closed in its meanings. This way of conceptualising culture implies that it is a conflictive, unstable and tense terrain, undermined by a permanent dispute to impose meanings through power relations. Culture is not considered as a body of 'traditional' knowledges or as an inert set of knowledges transmitted from generation to generation. Culture is taken as a system of meaning, through which people signify the multiple dimensions of their life. This includes their way of dealing with counting, measuring - all those issues we learn to call 'mathematics' in our schooling processes. This system of meaning is not static, but is repeatedly re-invented. From this perspective, it may possible to assume that there is a close connection between mathematics and culture: mathematics produces culture, but it is also produced by culture. However, what we usually call 'mathematics' is not a social production resulting from all our efforts; it does not incorporate mathematical contributions of all cultures, from the west and east, from the north and the south. Rather, we will see that the mathematical heritage of humankind is identified only with Western academic mathematics; the mathematics produced by the Western mathematicians. Identifying only part of the world's mathematical knowledge as 'the' mathematics masks power relations that legitimises a very specific way of producing meaning - the Western, white, male, urban and heterosexual way.

In summary, we can say that what we call 'mathematics' is a very specific way of interpreting the world, a way constituted by a very specific language, marked by a very specific grammar, closely connected to its uses, to a form of life. We, mathematics educators, are aware of this form of life, of this language, this grammar. We know how often its marks can be seen in teaching-learning school pedagogical processes, as well as in adult education.

Lately, I have attempted to go further in discussing these Ethnomathematics issues using the ideas of the German philosopher Wittgenstein especially those established in his work *Philosophical investigations* (2004). Wittgenstein's theorizations about notions such as *language-games*[3], *grammar* and *forms of life*[4] allow us to consider as mathematics other

[3] As mentioned by Glock (1996, p. 193), "the term 'language-game' is the result of Wittgenstein's extending, from 1932 onwards, the game analogy to language as a whole. (...) Like a game, language has constitutive rules, namely those of grammar. Unlike strategic rules, these do not determine what

mathematical knowledge besides the one usually identified by 'the' mathematics. His theoretical approach enables to consider different adult mathematical practices as mathematics in Wittgenstein words, different language-games, produced by different forms of life. Following Wittgenstein, we can say that the language-games associated with the Landless peasant's form of life are different to the language-games associated with the school's form of life and that such specific grammars produce different mathematics. In this I assume that there is more than 'a single' mathematics, denying the idea that the adult mathematical practices found in everyday life of diverse cultural groups are mere 'applications' of what is known as 'the' mathematics. Further, I assume there are many mathematics, all of them having *family resemblances*, as Wittgenstein highlighted.

However, it is important to stress that all these different mathematics do not have the same social value. From sociology we learn that there is one that is legitimized in our west culture: the one produced by the mathematicians at the academy. Academic mathematics, produced by the socially legitimated group that has the capability to 'produce' sciences is most valuable from the social standpoint. So, it is not a question of speaking naively about different mathematics, but of considering that these mathematics are, in terms of power, unequally different. For example, non-hegemonic groups like the Brazilian landless peasants are interested in learning the academic mathematics, because this may be a condition to access a more highly skilled, better paid job, or to achieve one's productive activities on more competitive levels. Therefore, when one refers to different mathematics, what is at stake is not simply the replacement the teaching of academic mathematics in its re-contextualized form (the school mathematics) by the other mathematics. There is not a single way of producing mathematics, even if we know that there is one which is acknowledged as a 'science', which must necessarily be taught.

Among these different mathematics we can include the mathematics produced by non-hegemonic groups like the Landless Movement, the mathematics I had called popular mathematics, even though I realised the theoretical difficulties involved in the use of the adjective 'popular' (see Knijnik, 2006) In order to avoid such difficulties, in more recent time I used the term 'peasant mathematics'. The next section of the paper is about some peculiarities of this 'peasant mathematics'.

move/utterance will bring success; but rather what is correct or makes sense, and thereby define the game/language. (...) We learn the meaning of words by learning how to use them, just as we learn how to play chess, not by associating the pieces with objects, but by learning how they can be moved".

[4] About this notion of Wittgenstein there is an interesting debate among the philosopher's interpreters concerning whether it has the same meaning when used in the plural or singular and to what extent it compasses both biological and cultural dimensions. For the purposes of this paper it is relevant to highlight that in his late work (corresponding to his work "Philosophical Investigations") Wittgenstein considered that "the meanings arise by the use of the words, mediated by rules, which emerge from our social practices, our habits, our form of life." (Condé, 2004, p. 52).

## Two different mathematics

One of the research projects implemented with the Landless peasants had as its goal to examine oral mathematics practiced by adults of that peasant culture. We were interested in knowing more about their oral mathematics that involving addition, subtraction, multiplication and division. As we have observed in the fieldwork, oral mathematics practices are present in the everyday life of the peasants who participate in this social movement. Their low levels of schooling meant that they were not aware of written algorithms but required the constant use of oral mathematics to recall specific rules. However, in the context of adult education in Brazil, there is a sort of 'forgetfulness' about this world outside school, about this mathematics with its different uses and its grammar. In curricular terms, it is useful to investigate the meanings produced by this 'forgetfulness', by the dichotomization and antagonism of the school mathematics and the peasant mathematics, specially the language-games that shape their oral practices. The investigation of such meanings may lead to a localized and partial achievement of a 'curricular justice'. Cornell (1995) defines this as curriculum organization which takes as one of its principles consideration of "the interests of those who are at a disadvantage" (Connell 1995, p. 12).

I want to make explicit three rules that shape the oral mathematics grammar produced by the Landless peasant form of life.[5] The first concerns the close ties between oral calculation strategies and the contingencies in which they are situated. For example, a peasant explained that, on estimating the total value of what he would spend to purchase inputs for production, he rounded figures 'upwards', ignoring the cents, since he did not want "to be shamed and be short of money when time comes to pay". However, if the situation involved the sale of some product, the strategy used was precisely the opposite. In this case, the rounding was done 'downwards', because "I did not want to fool myself and think that I would have more [money] than I really had." What was observed is that, differently from the school mathematics grammar that emphasizes the uses of written processes and the 'forgetfulness' of the context (as discussed by Walkerdine (1988)) the Landless oral mathematics language-games are strongly contextualized and involve complex reasoning. As part of the peasant mathematics grammar, the oral mathematics rules (like the ones presented above) are marked by immanence. On the other hand, as shown in textbooks and other instructional materials, at school it is taught that to round figures 'upwards' or 'downwards' one must only take into account whether the amount of cents is more or is less than fifty. This rule - part of the school mathematics grammar - is marked by abstraction, transcendence. It is clear that there are similarities between the oral peasant mathematics rules presented above and the written school mathematics rules. Following Wittgenstein, we can say that those language-games (shaped by their specific rules) have family resemblances. They are similar, but not the same. There is a peculiarity that distinguishes the peasant mathematics rationality from the school mathematics rationality: the immanence of the former versus the transcendence of the latter.

A second rule of oral mathematics language-games refers to the strategy of adding, based on a decomposition of the values to be orally calculated. This is what happened with one of the students in the workshop given by the students, when faced with a situation in which he had to calculate 148+239. He explained that, "first one separates everything [100+40+8 and 200+30+9] and then adds up first the numbers that are worth more [100+200, 40+30, 8+9]. (…) This is what really counts". This rule was found among almost all adults who said that they 'were good' at mental calculation. Differently from the addition algorithm taught at school, in

[5] This part of the text is based on what was discussed in Knijnik, Wanderer & Oliveira (2005).

oral procedures the peasants considered all the values of each parcel that was involved and how much difference it would make if it were hundreds, tens or units, i.e., they prioritized the values that contributed more significantly to the final result.

This priority also emerged when the numbers involved in the calculation were decimals. It is observed that recurrently, the peasants use decomposition 'to make up integers'. This strategy was employed by *Dona Nair*, a retired settler, who, as a child, attended school for only one year, and did not learn to read or write. On explaining the way she used mental calculation in her daily activities, she referred to a situation in which two products are purchased, one of them costing R$2.70 and the other R$2.90. She said that to find the amount to be spent, she first of all adds up the integers and then the cents, as follows: "2+2 makes 4. I complete the 90 [cents] with 10[cents] of the 70[cents] to make another 1 *real*. So 4+1 completes 5 *reais*, plus the 60[cents], and I have 5 and 60." Like those previously mentioned, also in situations involving decimals, what is prioritized in the calculation process are integer values that, according to the peasants, are 'more relevant' to the final sum, a relevance which is given by their culture. Here, again, one can see the immanence that characterizes the rules shaping the peasant mathematics grammar, i.e., the immanence of peasant rationality, which differs from the immanence of school mathematics rationality.

A third rule concerns the duplication strategy present in the oral multiplications, a process similar to that used in ancient Egypt (Gillings, 1982; Peet, 1970). This could be seen in an interview with *Seu* Nerci, an illiterate landless man, which had been filmed and used in as pedagogical material in a training course for Landless pre-service adult education teachers. When multiplying 92×R$0.32 (corresponding to 92 litres of milk produced and sold at 32 cents of real[6] [R$0.32] a litre), he first doubled the value of R$0.32, and obtained R$0.64; then he repeated the 'doubling' operation twice, finding the amount of R$2.56 (corresponding to 8 litres). He added to this the value of 2 litres calculated previously, and thus found the value of 10 litres of milk (R$3.20). The next procedure was to successively double the values found, i.e., he obtained the result of 20, 40 and 80 litres. Keeping 'in his head' all the values reckoned throughout the process, *Seu* Nerci ended the operation by adding to 80 litres, those corresponding to 10 litres and 2 litres (calculated previously), and thus found the result of 92×R$0.32.

*Seu* Nerci never went to school. When he was a child, the closest school to his home was 20 miles away and there was no public transportation in the rural zone where his family lived. Since early childhood, boys and girls were introduced into agricultural labour and no children went to school. He did not use pencil and paper to write down the sums as he multiplied them. When the video was made he suddenly withdrew to another room at the back of his house to perform the multiplication, only reappearing after he had come to the final result. After consideration other characteristics of peasant oral mathematics were apparent. The first concerns the need, explicitly mentioned by the adults, 'to concentrate to think'. Like *Seu* Nerci, most of the adults observed doing oral calculation practices became deeply involved in the act of reckoning, in an attitude of isolation and introspection. But, unlike *Seu* Nerci, many of the literate adults observed usually took notes during their oral calculations. The notes were used as 'markers' throughout the process, especially in those involving greater complexity.

In summary, we have observed the high level of reasoning involved in the landless oral mathematics. Even from the perspective of what we consider 'the' mathematics, there is a

[6] Real is the Brazilian currency which corresponds to 50 cents of the US dollar.

broad, important set of subjects operating in this oral mathematics, which shows the family resemblances of peasant mathematics and school mathematics. Another aspect that emphasizes such resemblances is the introspective attitude of the peasant when doing oral calculations, similar to that take on by those who work in academic settings.

It is clear that peasant oral mathematics is neither as formal nor as abstract as school written mathematics. Following the work of Wittgenstein (2004), we can admit the existence of these two mathematics, of two different rationalities associated with specific forms of life, each of them producing its own grammar. But we cannot say from an epistemological standpoint that one is more valuable than the other.

## Final remarks

The issues I attempted to discuss in this paper are no more than provisional, unmarked by hopes for certainty, in the sense given by Stronach and Maclure (1997). Although provisional, they open new possibilities to look at the Ethnomathematics field, constituting a theoretical tool-box that allowed me to examine the data collected in fieldwork with the Landless adult peasants through a new theoretical lens. Observing these adults practicing their oral mathematics I understood the importance of analyzing it from a cultural perspective. It has been shown that the peasant oral mathematics is produced by the Landless culture and at the same time, such a culture is produced by this specific mathematics. Since this mathematics is part of their way of giving meaning to life, it would be almost impossible to ignore the necessary close connections between oral mathematics and the school curriculum. It cannot be assumed that at school the peasants could leave 'part of themselves' outside. When they come to adult education projects, their peasant culture comes with them, even when the school curriculum tries to impose a sort of 'forgetfulness' about who they are, the music they enjoy, the food they appreciate, the grammar they use when talking, the grammar they use when adding, subtracting, multiplying and dividing. When this subtle imposition of denying their culture occurs, it is not surprising to see that it brings with it a resistance process. This resistance can be expressed by adult peasants through rejection of school (no-learning attitudes); can be expressed by pretending that they accept such an imposition (simply pretending). When they go outside school, their peasant mathematics is revived, showing that it can survive the school conservative practices that are bound by only one kind of rationality, one kind of language-games as mathematics. Maybe it will be possible to enlarge our adult mathematics education world, including other mathematics, other rationalities other forms of life. This enlargement may produce broader repercussions and open possibilities for a better relationship among people from different parts of the world and from different cultures. If so then our dreams of solidarity in our societies can be fulfilled.

## References


Bauman, Z. (1997). *O mal-estar da pós-modernidade.* Rio de Janeiro: Jorge Zahar.

Bouchard, D. (Ed). (1977). *Language, counter-memory, practice: selected essays and interviews by Michel Foucault*. New York: Cornell University Press.

Condé, M. (2004) *As teias da Razão: Wittgenstein e a crise da racionalidade moderna.* Belo Horizonte: Argvmentvm.

Connell, R. W. (1995). Justiça, conhecimento e currículo na educação contemporânea. In: L. H. Silva; J. & C. Azevedo (Eds.), *Reestruturação curricular – Teoria e prática no cotidiano da escola* (pp. 11-35). Petrópolis: Vozes.

D'Ambrosio, U (1991). *Ethnomathematics and its place in the history and pedagogy of mathematics.* In Harrys, M. (Ed.). *Schools, Mathematics and Work* (pp.15-25). Hampshire: The Falmer Press.

D'Ambrosio, U. (2001). *Etnomatemática: Elo entre as tradições e a modernidade*. Belo Horizonte: Autêntica.

Foucault, M. (2002). *Arqueologia do saber*. Rio de Janeiro: Forense Universitária.

Foucault, M. (2003). *Microfísica do poder*. Rio de Janeiro: Edições Graal.

Glock, H. (1996). *A Wittgenstein dictionary*. Oxford: Blackwell Publishers.

Hardt, M. & Negri, A. (2000). *Empire*. Cambridge, MA: Harvard University Press.

Knijnik, G. (2002). Ethnomathematics, culture and politics of knowledge in mathematics education. *For the Learning of Mathematics*, 22(1), 11-15.

Knijnik, G. (2004). Lessons from research with a social movement. A voice from the South. In P. Valero & R. Zevenbergen (Eds.), *Researching the socio-political dimensions of mathematics education: issues of power in theory and methodology* (pp. 125-142). Kluwer Academic Publishers: Dordrecht.

Knijnik, G. (2006). *Educação matemática, culturas e o conhecimento na luta pela terra*. Santa Cruz do Sul: Edunisc.

Knijnik, G., Wanderer, F. & Oliveira, C. (2005). Cultural differences, oral mathematics and calculation in a teacher training course of the Brazilian Landless Movement. *ZDM – Zentralblatt fur Didaktik der Mathematik", Germany*, 37(2), 101-108

Kolling, E.,Cerioli, P. & Caldart, R.(Eds.). (2002). *Educação do Campo: Identidade e Políticas Públicas*. Brasília, DF: Articulação Nacional por uma Educação do Campo. Coleção Por Uma Educação do Campo, n. 4.

Lizcano, E. (2004). As matemáticas da tribo européia: um estudo de caso. In Knijnik, G., Wanderer, F. & Oliveira, C. J. (Eds.), *Etnomatemática, currículo e formação de professores* (pp. 124-138), Santa Cruz do Sul: EDUNISC.

Lizcano, E. (2006). *Metáforas que nos piensan: sobre ciencia, democaria y otras poderosas ficciones*, Madrid: Ediciones Bajo Cero.

Movimento dos Trabalhadores Rurais Sem Terra (MST). (2003). Retrieved July 25, 2007, from http://www.mstbrazil.org/?q=about

Peet, T. E. (1970). *The Rhind mathematical papyrus: introduction, transcription, translation and commentary*. London: Hodder & Stoughton (British Museum 10057 and 10058).

Peters, B. & Burbules, N. (2004). *Poststructuralism and educational research*. Maryland: Royman & Littlefiled Publishers.Inc

Stronach, I., Maclure, M. (1997). *Educational research undone: the postmodern embrace*. Philadelphia: Open University Press.

Veiga-Neto. A. (1998). Ciência e pós-modernidade. *Episteme* 3(5), 43-156.

Walkerdine, V. (1988). *The mastery of reason*. London: Routledge

Walkerdine, V. (1998). *Counting girls out: Girls and Mathematics*. London: Falmer Press

Wittgenstein, L. (2004). *Investigações filosóficas.* Petrópolis: Vozes.