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REPRESENTATIONS OF TEACHERS ON CITIZENSHIP TRAINING THROUGH MATHEMATICS

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Abstract: This study aimed to analyze representations of mathematics teachers from the Municipal Public Network of RJ on training for citizenship through mathematics. To this end, he focused on his perceptions of the difficulties in exercising this function and on the limitations arising from his professional training, as well as proposals to overcome them with a view to improving his teaching practice. Theoretically, the work was based on scholars of education, concerned with the teaching of mathematics within the social context and as an instrument of its transformation. For the success of this attempt, we conducted semi-structured interviews with 64 teachers working in basic education in school units located on Ilha do Governador and neighboring neighborhoods. The data were interpreted under the mixed approach, quantitative/qualitative. The results suggest, more intensely among professors with less academic training, great concern for dimensions located in the formal teaching of contents and limitations regarding the critical view of social issues and the educational problems that surround them, which are increasingly complex and interdisciplinary. From the results, some suggestions are presented that refer to the reorientation of teacher training in mathematics. Such reorientation must point to the development of this professional's awareness of their social and interdisciplinary importance. This means encouraging their collective participation in struggles for professional development, for the improvement and updating of their teaching practice, which implies their insertion in the universe of new technologies, fundamental points for improving the quality of public-school education.
Keywords: teachers, professional updating, citizenship.

INTRODUCTION

When we reflect on the daily life of the public elementary school, especially from the Public Policies project for Educational Technologies, developed from 2011 to 2013 at the Laboratory Space of the Institute of Research and Urban and Regional Planning of ``Universidade Federal do Rio de Janeiro de Janeiro`` (LabEspaço/IPPUR/UFRJ), coordinated by Professor Tamara Tania Cohen Egler, we found that Mathematics is one of the most difficult disciplines for both students and teachers. Mathematics and its teachers are attributed stigmas of boring subject, out of reality, dissociated from other school knowledge and alienated teachers with no sense of their social role. Objectively analyzing the statistics, there is no denying that mathematics is the discipline that has the highest incidence of failures. Mathematics, stagnant in its methods and far from interdisciplinarity, updating and new technology practices, increasingly indispensable to the quality educational process (EGLER, 2014; MORAN, 2001), is of all disciplines the one that shows, in an exemplary way, the disaster of education, which lacks effective actions within the scope of public policies. It seems that the system is collapsing through the teaching of mathematics, full of mistakes, and we keep insisting on improving what cannot be improved (D'AMBRÓSIO, 1998).

For decades, scholars have confirmed our observations by stating that the teaching of mathematics suffers from a greater lack of definition of objectives in our schools and that discussions on the subject are rare, despite the efforts of teachers to improve the results of their work, diversifying methods, teaching techniques and processes (RODRIGUES, 1996).

On the other hand, we observed that the market promotes book launches with

suggestive titles that insist on expressions such as "New Mathematics", "Mathematics and Citizenship", "Mathematics and Life", "Mathematics and Reality", among others. When we analyzed the fundamentals of these teaching support materials, it seems that there is very little or almost nothing new, in terms of life, citizenship and reality. These attempts end up generating a feeling of emptiness in each teacher, as well as a desire to look for some light to the improvement of its teaching (D'AMBRÓSIO, 1998).This issue has been generating reflections on the role of mathematics in the dynamics of complexity and interdisciplinarity in the direction of citizenship formation in a critical, daring and human perspective (FAZENDA, 1979; FREIRE, 2002; FREIRE & SHOR, 2006; JAPIASSU, 1976; MORIN, 2000).

It is important to emphasize that in elementary school, students are in a phase of school life and age group in which they experience changes in the body, mind and emotional posture. Hence, it is up to the school to rethink its practices and its responsibility in the formation of future citizens. Ethics, criticality, awareness of rights and duties, sense of justice and humanity need to guide the teaching of all disciplines, including mathematics, to always walk inspired by the concept of ethnomathematics (D'AMBRÓSIO, 1993); Mathematics, according to this scholar, has a lot to contribute to the creation of links with the country's political context and the economic paths adopted by our rulers. Such dynamics involves the questioning of basic and practical situations of our own subsistence and constantly need to be worked through this discipline.

In general, we are faced with the myopic idea that these reflections belong only to the social sciences, as well as the role of training for citizenship. It is regrettable to see that this way of thinking is often established and reverberates in the context of mathematics teaching and, as several authors point out, this process has roots in universities (FRIGOTTO, 2001; MASSETO, 1998). This process ends up reinforcing mechanisms of aversion to mathematics, school failure and student exclusion. We understand that training for citizenship through mathematics is a fundamental point for improving the quality of teaching this discipline and a starting point for its insertion in fundamental interdisciplinary projects in increasing the quality of education as a whole. Such improvement goes through the fight on the part of the professors for better working conditions and wages, in proportion to their social conscience. A fundamental part of this mechanism resides in the reformulation of professional training based on teaching degrees, as several thinkers have indicated for decades (D'AMBRÓSIO, 1993; SERBINO, 1998).

We reiterate that the experience in everyday school life reveals that not all Mathematics teachers assume or even perceive this responsibility. For different reasons, many commit to this dimension of their work, while others seem to ignore this responsibility. Given the above, we were driven to carry out the present study in order to analyze, based on teachers' representations, this problem.

METHODOLOGY

The work was carried out with mathematics teachers in public schools in Rio de Janeiro, Ilha do Governador and neighboring districts. We contacted the CRE in that region to obtain authorization to conduct interviews with teachers during working hours. After acceptance by these professionals, data collection took place from March to November 2011. The semi-structured interviews supported by a semi-open questionnaire, as it is an effective instrument in qualitative research, facilitated the freedom of expression

of respondents in the exposition of their points of view (LUDKE & ANDRÉ, 1996). This questionnaire was composed of several questions that aimed to identify: 1. Time of teaching experience in the municipal network; 2. Respondents' education; 3. Perception of respondents on the importance of training for citizenship through mathematics; 4. Perception of the difficulties in carrying out the training work for citizenship and 5. Perception of the limitations arising from their professional training as hindering the training work for citizenship (Figure 1).

1. What is your experience as a teacher in the Municipal Public Network of Rio de Janeiro?
2. What is your level of education: Undergraduate, Graduate, Master's/Doctorate?
3. Mark on the line from 0 to 10 with a vertical line the importance of training for citizenship through mathematics. Explain your answer. Tell what other activities you think are important.

0 _____ 10

4. Mark on the line from 0 to 10 with a vertical line the degree of difficulty in the citizenship training work. Explain your answer.

0 _____ 10

5. Mark on the line from 0 to 10 with a vertical line how much professional training limits the training work for citizenship. explain your answer.
6.

0 _____ 10

Figure 1 - Questionnaire

During this process, we opted for a predominantly qualitative mixed approach that:

> "it works with the universe of meanings, beliefs and privileges values and attitudes, which corresponds to a deeper space of relationships, processes and phenomena that cannot be reproduced by the operationalization of variables" (MINAYO, 1994, p.21)

In questions 3, 4 and 5 of the questionnaire, the Linear Bipolar Scale of Semantic Differential was used, consisting of a 10 cm straight line segment to record the marks from 0 to 10 assigned by the interviewees. Analyzes of the answers given by the markings on the line presented in the interviews were carried out through the differences between the averages of the following ranges adopted: ranges of experience time (from 0 to 5 years, from 6 to 10 years, from 11 to 15 years, from 16 to 20 years old, 21 to 25 years old and over 25 years old) and schooling (undergraduate, graduate and master's/doctorate). In addition to markings, respondents were also able to express themselves freely in writing or verbally.

RESULTS

The answers to questions 1 and 2 of the questionnaire are summarized in table 1, which relate length of experience with education. The vast majority of professors (32) have a postgraduate degree and a minority (11) have a master's/doctorate. There is a trend towards a higher number of professors with postgraduate degrees and master's/doctoral degrees between 6 and 20 years of professional experience. We identified that there is a decrease in the number of masters/doctors from 21 years of professional experience and that with more than 25 years there are no professors with masters/doctors (Table 1).

The answers to question 3 revealed the importance given by the interviewees to training for citizenship through mathematics. We divided the total number of respondents (64) into 3 levels of education: undergraduate, graduate and master's/doctoral. The averages of the annotations on the line were respectively: 5.24; 8.14 and 8.94. The group of respondents was also divided by time of experience. We verified that this time does not have great significance in this work, due to the proximity of the numbers (Table 2).

The answers to question 4 revealed

Time of professional experience of teachers (in years)	Number of professors by their educational level			Total professors/ time of experience
	Graduation	Post graduation	Master's/ Doctorate	
Up to 5	03	05	02	10
6 – 10	03	05	03	11
11 – 15	06	07	03	16
16 -20	04	06	02	12
21 - 25	02	05	01	08
+ than 25	03	04	00	07
Total number of teachers/schooling	21	32	11	64 (total interviewees)

Table 1 - Time of experience and education

Problems mentioned	Number of professors by their educational level		
	Graduation	Postgraduate	Master's degree/ Doctorate degree
Remuneration	38,1 %	65,6 %	81,8 %
Disinterest, lack of base and indiscipline	85,7 %	31,3 %	36,4 %
Inappropriate content	9,5 %	62,5 %	63,6 %

Table 2 - Importance given to training for citizenship

Time of professional experience of teachers (in years)	Number of professors by their education and average of their marks on the line			Total number of professors/ times of experience and average marks on the line
	Graduation	Postgraduate	Master's/Doctorate	
Up to 5	n = 03 m = 5,5	n = 05 m = 8.3	n = 02 m = 8,2	n = 10 m = 7,43
6 - 10	n = 03 m = 4,1	n = 05 m = 8,1	n = 03 m = 9,2	n = 11 m = 7,31
11 – 15	n = 06 m = 5,8	n = 07 m = 7,7	n = 03 m = 8,5	n = 16 m = 7,14
16 - 20	n = 04 m = 4,6	n = 06 m = 7,8	n = 02 m = 9,4	n =12 m = 7,0
21 - 25	n = 02 m = 6,2	n = 05 m = 8,6	n = 01 m = 10	n = 08 m = 8,18
+ de 25	n = 03 m = 5,2	n = 04 m = 8,7	n = 00	n = 07 m = 7,20
Total number of professors/ schooling and average marks on the straight line	n = 21 m = 5,24	n = 32 m = 8,14	n = 11 m = 8,94	n = 64 m = 7,32
n = number of respondents and m = average of their marks on the line.				

Table 3 - Degree of difficulty in training for citizenship

Time of professional experience of teachers (in years)	Number of teachers by their education (n) and average of their marks on the line (m)			Total number of professors/ times of experience and average marks on the line
	Graduation	Post graduation	Master's / Doctorate	
Up to 5	n = 03 m = 8,4	n = 05 m = 8.3	n = 02 m = 8,0	n = 10 m = 8,27
6 - 10	n = 03 m = 9,6	n = 05 m = 8,8	n = 03 m = 7,7	n = 11 m = 8,72
11 - 15	n = 06 m = 9,5	n = 07 m = 8,4	n = 03 m = 8,3	n = 16 m = 8,80
16 - 20	n = 04 m = 9,7	n = 06 m = 8,2	n = 02 m = 7,9	n = 12 m = 8,65
21 - 25	n = 02 m = 10	n = 05 m = 8,0	n = 01 m = 7,6	n = 08 m = 8,45
+ de 25	n = 03 m = 9,8	n = 04 m = 8,1	n = 00	n = 07 m = 8,83
Total number of professors/ education and average marks on the line	n = 21 m = 9,49	n = 32 m = 8,31	n = 11 m = 7,95	n = 64 m = 8,63
n = number of respondents and m = average of their marks on the line.				

Table 4 - Percentage of citation of the problems that most obstruct the teaching work

Time of professional experience of teachers (in years)	Number of professors by their education and average of their marks on the line			Total number of professors/times of experience and average marks on the line
	Graduation	Postgraduate	Master's / Doctorate	
Up to 5	n = 03 m = 3,4	n = 05 m = 7,7	n = 02 m = 8,7	n = 10 m = 6,61
6 - 10	n = 03 m = 4,1	n = 05 m = 7,6	n = 03 m = 9,1	n = 11 m = 7,05
11 - 15	n = 06 m = 4,5	n = 07 m = 7,8	n = 03 m = 8,7	n = 16 m = 6,73
16 - 20	n = 04 m = 4,8	n = 06 m = 8,4	n = 02 m = 9,8	n = 12 m = 7,43
21 - 25	n = 02 m = 4,4	n = 05 m = 8,1	n = 01 m = 9,2	n = 08 m = 7,31
+ de 25	n = 03 m = 5,3	n = 04 m = 8,3	n = 00	n = 07 m = 7,01
Total number of professors/ education and average marks on the line	n = 21 m = 4,45	n = 32 m = 7,98	n = 11 m = 9,06	n = 64 m = 7,00
n = number of respondents and m = average of their marks on the line.				

Table 5 - Professional training and limitations for the formation of citizenship

the degree of difficulty perceived by the interviewee in the citizenship education work. We divided this result into two stages: The first, taking into consideration, the teacher's education. In ascending order of education, the average scores were: 9.49; 8.31 and 7.95. The second, taking into consideration, the experience time. Due to the proximity of the numbers, this factor has no meaning (Table 3).

Still on question 4, we can observe that both remuneration and inappropriate content have a higher percentage of citations as the respondent's education increases. As for students' disinterest, lack of foundation and indiscipline, the opposite occurs (Table 4).

The answers to question 5 revealed the interviewee's perception of how much professional training limits the work of training for citizenship. We divided this result into two stages: The first, taking into consideration, the teacher's education, divided into 3 ranges. In ascending order of education, the grades were: 4.45; 7.98; 9.06. We observed that the higher the level of education, the more the interviewee attributes the problems to professional training.

in teaching practice. The second takes into consideration, the length of experience, which does not have much meaning due to the proximity of the numbers (Table 5).

In response to questions 3, 4 and 5, most interviewees insisted on the importance they attach to formal teaching of mathematics in the contents, often to the detriment of training for citizenship, and this view is stronger among respondents with lower levels of education. Still regarding question 3, the interviewees made comments valuing the formal teaching of contents in the following percentage: 67% (undergraduate), 56% (graduate) and 27% (master's/doctorate).

DISCUSSION

Teachers in general, with less education, expressed themselves unmotivated, uncritical and non-politicized in relation to the difficulties encountered in the work of training their students' citizenship: "We are not prepared for this function... our role is teaching math. Even so, it's already complicated". The relationship difficulties faced by teachers, for the most part, were attributed to the culture of violence that is part of the urban environment and directly affects students from socially marginalized families, a predominant part of public schools. (ZANTEN, 2001): "Huge classes, a hodgepodge... civilized dialogue with these people is impossible. Critical work and citizenship training? No way!"; "School is not what it used to be. The students had a family... They don't have a base... I don't even want to know, I 'play' the subject, I don't convert it."; "These are fruits of the marginality of the favelas. Only fights and profanity!... This prevents any work beyond the beans with rice..."; "Educating citizens aware of their rights and duties would be ideal. It would be great to be able to discuss basic questions of the economy, of the day to day of their lives, but the attempts are in vain. We talk to the walls... We end up 'kicking the bucket'". With no prospect of a solution in sight, teachers seem to be on the verge of despair. Many end up "kicking the bucket", 'throwing' the blame for these ills on top of the student or repeating what common sense says, when it points out that 'today's school is not like it used to be'. Thus, the school has become an institution far from the social commitment to adequately serve the new generations due to their social origin (MELLO, 1982).

The feeling of impotence in the face of the chronic problem of undervaluation of teachers, materialized in low wages, is fully reflected in pedagogical practice (PUCCI, 1991). The teachers' indignation and lack

of motivation are constant: "What can they expect from us... We earn little to be everything and be nothing: teacher, psychologist, 'uncle', nanny, asshole... I arrive home exhausted. time to eat, fall into bed, sleep. The family is for later..."; "Only devaluation. Meager salary, zero career plan. And we are still a laughing stock for society. We age before our time or we push with our belly...". The media and their denigrating power of persuasion contribute to reinforcing the process of devaluing teachers, attributing the blame for school dropout and unsatisfactory learning results to poor teacher training. But they do not mention the terrible working conditions (FRANCHI, 1995). "Just pay attention to the jokes on television and see how much we are worth to society!"

When talking about professional training, the most critical interviewees provided us with important data for a better understanding of the problem related to the limitations faced in their teaching work. In general terms, criticism directed at colleges focused on the limitations of teaching degrees due to their overly technical character and at the same time technologically retrograde and without valuing new technologies as an effective pedagogical practice. This way, the potential for the development of creative, integrating and updating skills is limited, linked to the pedagogical and educational dimensions, indispensable in the preparation for teaching.

Many associated poor trainings in undergraduate courses with the fact that mathematics was so uninteresting for students: "We are not formed to arouse pleasure, but to scare away most students with mathematics, so how can we think about social inclusion?" In the period between childhood and adolescence, our elementary school students experience transformation processes towards maturity, motivated by the energy of enchantment, of pleasure (ALVES, 1995). They are very receptive to waiting for information and activities that are linked to their lives. We are not prepared to effectively take advantage of this energy and find attractive ways through mathematics and, through informality, creativity, playfulness, the appropriate use of technological resources, overcome the negative stigmas that greatly impede its teaching from the student's reality and, therefore, its role in training for citizenship.

Some of the most expressive statements in this direction say that: "The college produces great mathematicians and terrible teachers. Educators, then, even worse. Critical sense and social and political vision, so... it's a joke!"; "Our training is technical and at the same time we fail to take advantage of the enchantments offered by the modernity of technologies in teaching. degree has nothing to do with the classroom... We learn a world of fantasies and, at the moment of truth, what counts is courage and improvisation because we are thrown, without access to up-to-date pedagogical resources, into the cage of beasts."

Less critical professors, in general with a lower level of education, defended the professor's exemption in relation to critical-social postures and the formation of citizenship, which extended to not blaming the faculty for this posture: "I do not agree with the idea that the teacher must be an educator or assume extra functions or be a citizen trainer. The degree does not qualify us for that and that is not your obligation." Many boast a supposed competence acquired in college stating that "the important thing is to be a good math teacher and technically capable and that's what the college does. And nothing more than that to not invade other colleague's subject and not be seen as strangers in the nest." This is the opposite way to the much proclaimed and discussed interdisciplinarity, by several scholars, over decades, fundamental in the work of educating

for citizenship (BERGER, 1972; EGLER, 2014; FAZENDA, 1979; JAPIASSU, 1976; MORIN, 2000).

The opposite attitude was more present among professors with postgraduate degrees in defense of their commitment to a civic attitude in teaching practice: "The faculty does not prepare professors, much less educators. Its 'brainwashes', throws a bunch of alienated people without commitment or social and political vision into the job market"; "During five years of teaching, I heard everything from professors and even colleagues, but never the word 'citizenship'!... What do they expect from us?"; "At most, when they have nothing to teach, they improvise, assuming the role of just 'uncles', good guys, funny ones so as not to 'punch the knife'". The training courses lack seriousness and do not concretely address the school reality, opening a chasm between the professional preparation phase and the school or classroom (ROSEIRA, 2010).

Mathematics teachers tend to manifest themselves as professionals alien to the social totality, with a very restricted view of the problem that afflicts them in their professional routine. The marks of awareness of the social role of the mathematics teacher seem to be erased. Few teachers, in rare moments, justified their feelings through explanations based on social, economic, political or historical reasons. The lack of clarity of the interviewees about the social and political causes was more evident among those with less education, when they spoke of the factors that hinder their teaching practice. The various difficulties faced by teachers permeate working conditions and remuneration and converge with those related to their professional training. This needs to be urgently reformulated and inserted in the universe of transformations resulting from new technologies, fundamental for the interdisciplinary network dynamics. Such dynamics are essential for accessibility to the complexity of knowledge and knowledge, in permanent dialogue, without which, we will continue to "punch the knife".

CONCLUSION

The basic education teacher's pedagogical practice needs to be focused on the molds of citizenship, which will contribute greatly to the formation of individuals capable of promoting changes in their lives and their insertion in society. The training work for citizenship must consist of diversified and integrative practices and the dynamics of interdisciplinarity, a path capable of leading our students to an awareness of their rights and duties, foundations for building values of humanity. In the case of mathematics, its fundamentals must go from theory to practice and be directed to the contextualization of the different situations that involve the student's life and from the student's point of view (D'AMBRÓSIO, 2009).

Improving the teaching of Mathematics, like any other discipline, requires improvement in working and salary conditions and, in the specific case of Mathematics, the reformulation of its professional training has a preponderant weight. This reformulation consists of the importance of teaching practice focused on training for citizenship, which means raising the level of awareness of the social role of its teachers.

It is also worth reflecting on professional training at the undergraduate level. It is necessary that professional training provides the essential elements for the development of a critical attitude of teachers not only with regard to teaching and professional issues, including their engagement in struggles for improvements in working conditions and remuneration, in its strict sense., as well as with regard to understanding the socio-economic, political and ideological context

in which education is situated and to which it converges.

Such an integrative utopia will imply overcoming the old and ever-renewed practices of personalism, improvisation, bureaucratic obstacles, authoritarianism, exclusion of minorities, elitism, content dissociated from modernity updates and so many other vices that impede the progress of school, in the sense of its democratization. For this purpose, the curricular experiences promoted by disciplines in the fundamentals area, such as: philosophy, sociology, economics of education, psychology and anthropology, in a networked and interdisciplinary perspective, deserve to be highlighted. From this perspective, we highlight the importance of inserting the teacher in the context of the advancement of new technologies and their contextualized application in pedagogical practice. We believe that this transformation will be one more step, in the fight against the technicist tendency, and therefore, uncritical, that historically has permeated the formation for the exercise of the teaching profession in general and, particularly, of mathematics teachers.

REFERENCES

ALVES, Rubem. **Conversas com quem gosta de ensinar**. São Paulo: Ars Poetica, 1995.

BERGER, Guy. **Opinions and Facts in interdisciplinarity: Problems of Teaching and Research in Universities**. Paris: OECD, 1972.

D'AMBRÓSIO, Ubiratan. **Etnomatemática.** São Paulo: Ática, 1993.

D'AMBRÓSIO, Ubiratan. **Educação Matemática da teoria** à **prática: Uma breve Introdução da matemática e sua história**. São Paulo: Papirus Editora, 2009.

DEMO, Pedro. **A Pobre Educação Pobre – Alguns problemas de falta de recursos – MEC. Revista: Educação e Sociedade – CEDES**. São Paulo: Cortez, 1981.

EGLER, Tamara Tania Cohen (Org.). **De baixo para cima: Política e tecnologia na educação.** Rio de Janeiro: Letra Capital, 2014.

FAZENDA, Ivani. **Integração e Interdisciplinaridade no ensino brasileiro: efetividade ou ideologia**. São Paulo: Loyola, 1979.

FREIRE, Paulo. **Pedagogia da autonomia: Ensinar exige estética e ética**. São Paulo: Paz e Terra, 2002.

FREIRE, Paulo & SHOR, Ira. **Medo e ousadia: o cotidiano do professor**. Rio de Janeiro: Paz e Terra, 2006.

FRANCHI, Eglê Pontes. **A causa dos professores**. São Paulo: Papirus, 1995.

FRIGOTTO, Galdêncio. **A produtividade de escola improdutiva: um (re)exame das relações entre educação e estrutura econômico-social capitalista**. São Paulo: Cortez, 2001.

JAPIASSU, Hilton. **Interdisciplinaridade e Patologia do saber**. Rio de Janeiro: Imago, 1976.

LUDKE, Menga & ANDRÉ, Marli. **Pesquisa em educação – abordagens qualitativas**. São Paulo: EPU, 1996.

MASETTO, Marcos. **Docência na Universidade**. São Paulo: Papirus, 1998.

MELLO, Guiomar Namo de. **Magistério de 1º Grau: da Competência Técnica ao Compromisso Político**. São Paulo: Cortez – Autores Associados, 1982.

MINAYO, Maria Cecília (Org.). **Desafio do Conhecimento: pesquisa qualitativa em saúde**. Rio de Janeiro: Hucitec - Abrasco, 1994.

MORAN, José Manuel; MASETTO, Marcos Tarciso; BEHRENS, Marilda Aparecida. **Novas tecnologias e mediação pedagógica.** São Paulo: Papirus, 2001.

MORIN, Edgar. **Os sete saberes necessários à educação do futuro**. São Paulo: Cortez, 2000.

PUCCI, Bruno. **O processo de proletarização dos trabalhadores em educação**. Porto Alegre: Pannoaonica, 1991.

RODRIGUES, Luciano Lima. **Matemática ensinada na escola e a sua relação com o cotidiano**. Brasília: UCB, 2005.

ROSEIRA, Nilson Antonio. **Educação Matemática e Valores: concepção dos professores à construção da autonomia**. Brasília: Liberlivro, 2010.

SERBINO, Raquel Volpano et. al (Org.). **Formação de Professores**. São Paulo: Fundação editora da Unesp, 1998.
ZANTEN, Agnes Van. **L'école de la périphérie: scolarité et ségrégration en banlieue**. Paris: PUF, 2001.