

## **Perspectives and challenges of the indigenous teacher education: the teacher educator external to the culture of the “other” in the center of attentions**

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Abstract - This work must be understood as a set of ideas and proposals on the manners of direction to be taken by the indigenous teacher education when the perspective lies in taking into account the culture that each one brings inside oneself. These ideas – resulting from our experience as indigenous teacher educator - must represent, in its whole, one point of view and one direction for the transformations required in the education of the educator external to the indigenous culture, to the “other” group. Along the discussion we have come across with some perspectives, different points of view, conflicts and challenges and passed through a critical evaluation on the indigenous teacher education and the education of the indigenous student, once that much has been questioned on the parole of this educational movement in the society and on the greater or smaller neutrality in terms of the action of the indigenous teacher educator.

1. The text hereby presented must be understood as a set of ideas and proposals on the manners of direction to be taken by the **indigenous teacher education** while line of research and educative action when the perspective lies in taking into account the culture that each one brings inside oneself. These ideas – resulting from our experience as (mathematics) educator of the indigenous teachers – must represent, in its whole, one point of view and one direction for the transformations required in the education of the educator external to the indigenous culture, to the “other” group.

2. At the same time we are in a quest for the reflection of various and necessary relations between teacher education, culture and pedagogical practice. We ensure the right of caution in regards to such perspective for we know that:

- when we reflect on the indigenous teacher education we are focusing on one confluence between what goes on in the community, in the (professional) life of the teacher, in the formative dynamics and in the curriculum of teacher education among others. Therefore, as our reasons intend to encourage the teacher educator to recognize and value the intuitive/experimental knowledge of the indigenous teacher, we will be emphasizing how challenging and dangerous this movement is;

- when we consider boundaries within a set of questions that involve mathematics education, culture and teacher education, it's not easy to draw the distinction between mathematics and the teacher education on one hand, and cultural questions, on the other.

## Opening paths

3. The indigenous education, in terms of Brazil (and we think we can consider it in worldwide terms), has always been a national inside a larger project which did not make it possible the concept of plurality, since it contained in its interior – silently – the proposal to unify the differences, not attributing value, therefore, to the matter of diversity. As a result we have sustained the loss of memory of many indigenous societies. An estimate calculation is that, in Brazil, about 800 indigenous languages have disappeared in the last 500 years. And so, we are still far from having achieved the construction of a more ethical and respectful society.

4. However, although we are talking of a movement, this has been placed between the national/international concerns of political-educational order and new developments that have, in there, occurred in the scope of education. In this perspective, the emancipation of the indigenous people(s), as colonized people, is a discussion every time more frequent in many parts of the world. Allied to this is also, in frank development, the discussion of this emancipation in the scope of education - opening a space toward an educational system that can meet the cultural particularities of each ethnic group, situated in a modern technological world

5. One of the approaches has been the development of the educational institutions - the school of and in the village – more and more in the hands of the indigenous people themselves, under the orientation of each one of the indigenous peoples. In this direction, Grupioni (2003, p.13) says:

In the national indigenist scene, it seems today to be a consensus the proposal that indigenous schools of quality will only be possible if ahead of it were, as professors and as managers, indigenous teachers belonging to their respective communities. To form indigenous people to be teachers and managers of more than 1,400 schools, located in indigenous lands, is today one of the main challenges and priorities for the consolidation of an Indigenous Scholar Education guided by the principles of the difference, the specificity, the bilingualism and the interculturality.

6. MONTE has also pointed to what is being developed in the indigenous schools and indigenous teacher education in as much as quantitative terms as qualitative:

There are good indigenous schools if we take into account some factors that gradually advance in relation to the past, as a strengthening of the democratic mechanisms of the Brazilian society. The indigenous schools - around 2500 countrywide - present each time more proposals of communitarian control, that is, the number of schools under the responsibility of the community grows, even if paid by the government, with indigenous teachers formed in the teaching courses that exist in Brazil. (MONTE, 1999, 5-11)

7. From the start, we can say that facing this development - the indigenous scholar institutions in the village - an in-service teacher education is being directed on the part of non-indigenous educators, in general, parallel to the performance of the indigenous teacher in the classroom, who have been looking to develop it in a way to seek more appropriate educational resources, not only in the cultural point of view but also in the linguistic one.

8. And, as well as language, mathematics has an important role to play in this culturally situated movement. Historically, the participation and the range of mathematics in the life of indigenous children and adults have caused great concern, as well as being subject to many programs of intervention. And the establishment of programs related to mathematics in the indigenous schools is, from our point of view, more difficult, tense and worrisome than in other disciplines, for at least two reasons. First, as a discipline, mathematics is also recognized today as not exempt from cultural influences - this point of view fairly argued over, today, by the ethnomathematics studies. Second, there is a need to learn it, especially for the advancement of the economy, but there is a limitation of practical order: the mathematics teachers, even the most qualified, have little possibility of performance because the unpreparedness towards an intercultural acting/education and to the requirements of the language.

9. In this perspective and being responsible for one of the educational nuclei/movements of this kind<sup>1</sup>, our objective in this course is to understand the issues that have been posed by the indigenous teachers, once they have become responsible for the (mathematical) education of their people, in order to understand how its development - as mathematical educator - can be better supported **by external educators to their culture**.

10. The work still is, from our point of view, in exploratory phase and aims at sensitizing and to provoke awareness in the non-indigenous teacher educator concerning the complexity of the task to understand how the development of the indigenous educator (mathematic) can most be supported by educators external to his/her culture - how to go deep or to go beyond the accumulated knowledge on one or another subject, in general, constructed into the core of the learning-by-doing processes of the indigenous culture.

11. In a general way, we have considered that in this context of teacher education, we have to give as much attention to the **development of the indigenous knowledge that has origin and construction - genesis - in the interior of the indigenous context**, as well as to **the contents (mathematic) of the non-indigenous school**. Our beliefs for such end are firmly supported by those of BARTON & ALANGUI (2004: 329-342):

Indigenous knowledge, as well as covering many different areas of interest, (from those that might be termed scientific to those that can be termed spiritual), has another feature which is vitally important: indigenous knowledge does not bear categorisation in terms other than those of the

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<sup>1</sup> Since May of 2002, in a partnership between the College of Education/USP and the Secretary of Education of São Paulo, I have co-ordinate the Indigenous Teacher Education Program for the Elementary Level (Programa de Formação Magistério do Professor Indígena para Educação Infantil e Séries Iniciais ( 1ª à 4ª ) do Ensino Fundamental), whose basic intent has been to reorient a proposal of learning/teaching for the elementary education schools of the indigenous villages in the State of São Paulo, in a way that the indigenous teacher takes over the school of the village. I was also responsible for the lessons of the mathematics course, as part of the curriculum considered for the Indigenous Education Program. 61 indigenous professors - from 21 different villages located in different regions of São Paulo - 20 of them in each Educational Center (CEFAM - Bauru, Guarujá and Tucuruvi-SP) have participated in this formation - where they developed concomitantly basic education and specialized education. It is important to highlight that the indigenous teachers, who have not completed basic education, would have to attend a basic education course, with duration of 6 months; the others, started a stage called specific, that would be equal to a work at high school level, according the indigenous education curriculum. Currently, I co-ordinate the Intercultural Of The Indigenous Teacher Undergraduate Course for the Elementary Level (Formação Intercultural Superior do Professor Indígena para Educação Infantil e Séries Iniciais (1ª À 4ª) do Ensino Fundamental), at the School of Education of the University of São Paulo - which began in June/2005 and is due to finish in June/2008.

indigenous group concerned. The moment a piece of indigenous knowledge is categorised as “biology”, “gynaecology”, “politics” or “mathematics”, it is likely that it has been shifted from its original context within a world view, and it probably appears as something less than it really is in its own cultural context (unless, of course, the category is genuinely one within that world view). Indigenous knowledge can only be properly understood from within the world view of that indigenous group. Indigenous knowledge can, of course, be appreciated, largely understood, valued, and used by people outside its originating group. However its full and proper understanding is inextricably linked to that world view.

**12.** The vision above has been our starting point. Our perspective of work, as non-indigenous teacher educator, has been based in the assumption that both the non-indigenous and the indigenous children who come to the regular urban school or indigenous - as the men and the women of the field or other ethnic-social groups - know things in a specific way. That is, it has a way to read the reality and this reading is made with the categories/techniques available to them.

**13.** In the opening lecture of the Course of the Indigenous Teacher Education - MAGIND, in July of 2002, aimed at leaderships and teachers of indigenous villages supported by the course, the speaker Ubiratan D'Ambrosio (2002) placed, in the center of his speech, the problems and the wealth **of the relation between two different cultures in the pedagogical process**, affirming that “the indigenous teachers have a difficult enough mission, beyond rescuing and to develop the knowledge of the culture of their people they also need to bring for their people the knowledge the non-indigenous”. D'AMBROSIO did not lighten up the difficulty of the situation, making it clear the existence of a dominant culture, in which the individuals not pertaining to it shall continue without its the knowledge, to the edge of society. He was extremely incisive when highlighting the presence of the dominant ones and dominated in all the cultures and all the times and the fact that when "a culture finds itself a little better than another for political, economic and social interests it dominates to other, despising it, in the most ignorant manners possible". D'AMBROSIO still mentioned the necessity for us to respect each other more, "knowing each other better searching ways so that the communication happens"

**14.** In this sense, the school work must have as a base the **assumptions of ethnomathematics whose central focus is** in taking into account, at the school, the knowledge generated in the culture - as much to become more significant what the teacher wants to teach as to give to the indigenous teachers more cultural, intellectual, affective, social and political power. In truth, within the spirit of ethnomathematics we start to recognize, better yet, learn to understand from discussions/researches inaugurated by D'AMBROSIO, that it's necessary in education (mathematical) to be aware to perceive the codes of the "other" before, immediately, insert it inside our categories

**Non-indigenous teacher educator and indigenous teacher educator: great challenges**

15. If we carried out a small inquiry with the non-indigenous educators who are committed with the indigenous teacher education in Brazil we can almost affirm that they would disclose that they have as daily preoccupation and first perspective the formation to understand the questions whom that have been formulated to the indigenous teachers - responsible, currently, for the education of their people. In other words, the non-indigenous teacher educators would disclose that their perspective is to understand the problems of the indigenous teachers in light of the education of their own peoples, in order to guide the formation from the necessities and solutions of essential problems of the community, of the daily life of the indigenous communities

16. Inside of this wider perspective, we have come across one with other perspectives, different points of view, conflicts and challenges of socio-anthropologic-political, psycho-epistemologic, ethnic-linguistics order among others. More and more, the formation of the teachers and the education of the student have passed through a critical evaluation, once that much has been questioned on the parole of the education in the society and on the greater or smaller neutrality in terms of the action of the educator

17. The studies around the questions, that involve the education of the natives, in the scope of the mathematical education have led to problems of socio-anthropologic-political nature, placing us in front of contradictory positions e, therefore generating enormous *challenges* on the position that we must take in light of the contents to teach and the methods – *the what* and *how* to teach, and *why* and to *whom* to teach this or that content. SKOVSMOSE (2002) brings a position placing himself, in some way, in favor of it

In 1954, Hendrik Verwoerd made this affirmation in his speech to the South African Senate: ‘When I have the control over native education I will reform it in such a way that the natives will be taught since childhood to perceive that equality with Europeans is not for them... People who believe in equality are not desired as teachers for the natives... What is the point in teaching Bantu mathematics if he cannot use it practically? This idea is almost absurd.’ To Verwoerd, the most important task was to make it clear that the negroes may be denied the right to climb the social ladder. Being excluded from universal mathematics also means to be excluded from the prerogative to grow in society”.

In another moment, still referring to the natives from South Africa, a similar point of view in relation to the above in HORSTHEMKE & SCHÄFER (2006):

“The Science and Technology minister, Mosibudi Mangena, in a lecture at the South African Annual Congress of Mathematics Society, at Potchefstroom University, in 2004, says incisively: ‘there is one thing that we need to expedite before anything. We need to increase the number of youngsters, particularly negroes and women, that may be able to finish successfully the course of Mathematics in our universities.’

... How can this be achieved? There are here, two critics/preoccupations to reach this goal... the tendency, quite popular, which demands the introduction and the incorporation of the so talked about ethnomatematics, more particularly one ‘African mathematics’ in the curricula of the high schools and colleges. It’s important to recognize ‘African mathematics as valid and invaluable – simply because its African?’

... Not only do I worry in the real/superficial sense of 'belonging' as far as the idea of some exclusive mathematics and distinctively Africana and with the threat of continuous and progressive marginalization and degradation of the minorities, but also with the implicit humiliation of the very nature of this approach”.

**18.** D'AMBROSIO (2007), in turn, has a radically contrary positioning relation to the development of those culturally different in the scope of the school. According to the author, the positions/expectations above can generate irreversible cultural distortions when adopted in a generalized way:

“ We are interested that a tree flourishes, then we would be taking good care of its branches, but it will never be strong if its roots are not good, deep ... It's useless to try straightening the things of a society if you don't give to the elements that will work in that cultural root, which will grant them strength. If you do not give it, they may be easily manipulated. It's an individual feeling hunger, he fights not to be hungry and when you offer food he feels satisfied: “I sublimated hunger!” However, we want something deeper. Because I feel hunger, does it mean that the other doesn't? You can only enter this reflection if you have deep roots and think:”I know myself and know that I am as much a human being as that other one. I know that my culture has as many accomplishments as the other's culture, so, why is it that I am hungry and must wait for the food that he serves me? ” This is the main thing; this is the essence of all this reflection that we are making about this damn society in which we live, this damn civilization. Therefore, why do you make ethnomathematics? It's not because with that ethnomathematics he will earn more, or will be able to work more! It's because in this moment he begins to reinforce his cultural roots which make him feel proud, a positive pride that fortifies him enough to question he who hands him a plate of food... This has always been my standpoint. The other radicals say that we must make the struggle now in order to get it all now and forget these deep roots.”  
(D'AMBROSIO APUD CARVALHO, 2007)

**19.** Regarding the concerns presented by SKOVSMOSE and HORSTHEMKE & SCHÄFER they are, in some way, focused on the issue of culture directly examined in the context of South Africa. The focus of the discussion is the concern that at the height of the movement "apartheid", the government condemned the black students to a lower curriculum implemented in schools in low resources and, ironically, the official document presented the proposal educational, with clear demonstrations of segregation and hierarchy, showing the importance to take into account the culture of the group at work and school permission to express itself in the African language. And, "in the ideology of 'apartheid' culture takes a meaning especially with the race and its results are devastating.“. (VITHAL AND SKOVSMOSE, 1997).

**20.** All in all, we find important to stress out that when we think the relationship non-indigenous teacher educator and indigenous teacher - which, in turn, will be educating the child and the indigenous adolescent - all the educators, in special those teacher educators external to their culture, should assume an attitude of alterity, trying to build in the meeting with different "other" a transformation in his/her knowledge and cultural representations.

**21.** Focusing closer the indigenous teacher education in order to understand how his/her development - as (mathematics) educator - can be most supported by external educators

to his/her culture, we perceive in this relation problems of psycho-epistemological order that articulate themselves and overlap. Of one side, the teacher educator seems to know that it is expected that he listens and understands the problems of the indigenous teachers in light of the education of his own people, that he knows to listen what the indigenous teachers have to say, what they feel, what they expect, what they think, respecting the cultural, social and religious differences.

22. It is expected that the teacher educator develops his/her work from the "reading of world" of the indigenous teachers, of the knowledge they bring, of the learning-by-doing already experienced and, then, to choose - with them - contents and methods of teaching that contemplate its necessities and favor a critical and liberating education for his/her people. To know to listen implies, for PAULO FREIRE, the permanent availability of the "subject that listens for the opening of the other's speech, to the gesture of the other, to the differences of the other" (FREIRE, 2002, p. 127-8). Moreover, it is **listening** that the teacher educator learns to speak with the teachers.

23. And here is the great challenge: the **listening** of the teacher educators... We, as teacher educators, have a poorly developed "listening". In general, we, as teacher educators, formed by the non-indigenous school are not prepared to listen to and, then, speak **with** the "other". In truth, when emphasizing **the listening on the part of the involved educator** with the indigenous teacher, we are in opposition to the pedagogical actions that spin around the **explanations** or in which **the questions for the indigenous teachers already come formulated by the educator/teacher educator, in general external to the indigenous culture** - an environment in which the educator/teacher educator does very little "listening" from the teachers or looks for interacting dialogically with the questions formulated by them.

24. In this context, there is another challenging point: the formulation of questions by the indigenous teacher - the **questioning from there... the questioning of the indigenous teacher**. Curiosity of the "other" (indigenous) is yet another challenge of this educational encounter. And, the attitude to ask when reflected in the educational scope is of difficult understanding and opens a wide variety of interpretations, of which two may be here considered, the question of the relevance and of the conditioning.

25. Relevance, as a term loaded with values and objectives that a person uses to indicate that which he/she feels as appropriate, important or indicated for this or that other situation. Thus, the teacher and the indigenous teacher may recognize, for example, the relevance of learning math in terms of just non- indigenous school or in a situation of silence in the classroom not as discipline (comfortable situation for the non- indigenous teacher), but as an absence of pre-disposition and interest for the subject at hand.

26. Conditioning is another term loaded with ambiguity in the scholar context, whose meaning is especially relative. In the so called traditional education our classroom is expected to be a place for answers instead of answers, "*the educator, in a general way, already brings the answer without having been asked anything!* (FREIRE, 1986)". Therefore, in the classroom, the non-manifestation of the student is related, to some extent, to more immediate attitudes which got established between student and teacher. Inversely, when we intend to build a dialogical environment in the classroom, begin the class through the student's speech is a crucial point of the process, however, especially deactivated in the relationship teacher-student.

27. Thus, challenges such as “the listening”, “the asking about” and, therefore, the “mutual questioning” (ALANGUI, 2006) must be in the heart of the construction of the relationship non-indigenous teacher educator and indigenous teacher who - other challenge for the formation of indigenous teachers. In reality the great challenge is in the interpretation — of the dialogic education — in FREIRE (1970):

“There cannot be dialogue, without intense faith in our fellow human beings. Faith in our own power to make and remake, to create and to recreate. Faith in a calling to be more, which is not just a privilege for some select few, but a right for all human beings. Faith in human beings comes first before this dialogue, because faith exists before the dialogue. The dialogical human has faith in human beings even before to meeting them face to face”.

28. The indigenous undergraduate education has as perspective that the educators, as teacher educators, should meet the transdisciplinary way of the teacher to build knowledge, once the artifacts construction of knowledge and ideas for them is almost always a result of:

- the fusion/ intertwining of reflections and practical actions;
- the construction of things connected with traditions and costumes;
- the interaction in cooperative work;
- the relationship among myth, religion and science;
- the link in activities of the father and/or the mother.

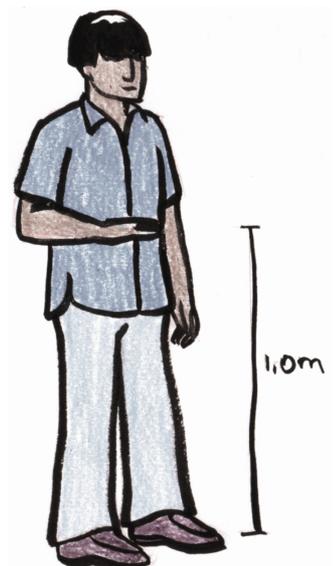
29. In other words, the indigenous subjects have the reality in which they are immersed, their source of knowledge, which is in general, generated in a transdisciplinary/holistic manner. In reality, the indigenous subjects have their own way to read the world and this reading is made through the categories/techniques available, which are not built by academic ways, by the accumulation of disciplinary knowledge (scholar).

30. And, the great challenge for us, as non-indigenous educators, in light of the transdisciplinarity as a process of knowing, lies in the fact that at the same time we look for an interaction with the indigenous teacher as a means to perceiving his/her knowledges and codes – respecting their individualities and his/her collaboration for a common knowledge — we have only built knowledge through one or another discipline and, then, we run the risk to inserting them into our (disciplinary).

31. Let’s think about the construction of a Guarani mathematical knowledge as a transdisciplinary process — one situation an in which the combination of reflections and practical actions are in the core of the construction of the knowledge of “area”:

*The non-indigenous teacher Domite started a conversation in the classroom, with a group of Guarani male and female about the mathematical notion of area, asking: “What is area?”, “When you speak or think about area, how do you understand about what you are thinking?”*

*For a few minutes, the indigenous teachers didn’t express themselves. Then, while some started to rehearse explanations such as “... It has to do with the demarcation and setting boundaries of land” or “the area of a square is in square meters...”, the teacher Antonio Macena Guarani stood, went to the front of the classroom and gesturing – almost in a dance-like*



*manner – started to speak:* “The meter is for us this distance here, from the navel – points the navel with the finger and shows the distance until the floor. This measures one. Our houses, the typical Guarani house has at its highest point, in the center of a rectangle of 2 by 4 meters, our height plus half a meter”. (*Antonio* shows his height with the hand above the head and points up with the hands forming a triangle, saying, plus half a meter).”The area of the house is 2 by 4. Around the corners it is has our height”. (*Antonio* shows his height placing the hand on top of his hand). “Then we can stay upright until the corner”. At this point, *Antonio* spun, almost as if dancing, and explained again the Guarani house.

**32.** The situation above may sensibelize an educator who has a transdisciplinary perspective of knowledge, however, the challenge of dealing with that vision may be translated in questions such as: a) What is the mathematical sense of the *area* measurement, for a Guarani person, out of the practical context?; b) Upon such a situation as the one presented by the indigenous teacher Antonio, the teacher educator must/may direct the teaching and learning of the notion of *area* from the format/measure of the Guarani house?; c) The contextualized knowledges of the students, when taken into account, contribute to the learning, by the school, more significative as well as it may give the students more intellectual, affective, cultural, social, political, racial power?

**33. Problems of ethnic-linguistic order** are also especially challenging in light of the perspective to orient the formation of the indigenous teacher to act in a bilingual context, orient them, instruct them to ensure the indigenous language as well as Portuguese to the children. This means to say, to lead them into alphabetizing the children in both languages, as well as the fluency of the youngsters. Different indigenous groups have different expectations with regards to the indigenous language as graduating to work solely conversation and/or to work exclusively with reading for academic purposes and/or to encompass the hear-speak-read-write.

**34.** From our perception as teacher educators - upon meeting with indigenous groups – it is neither prudent nor ethical to orient a standardization of the indigenous languages once there are diverging opinions as far as the writing is concerned, as well as in certain ideas in indigenous language and, still conflicting opinions as to the same speaker/writer expresses him/herself in different moments, the same ideas through different words.

**35.** Challenging questions have been proposed in the context of learning or deepening knowledge of the indigenous language, such as: What is the importance and the role of the standardization of one or another indigenous language? How to propose the standardization of a indigenous language? Without standardization, how do we cope with the texts for the children?

**36.** Some initiatives/decisions have been taken among the teacher educators and indigenous teachers from the State of São Paulo having as base the fact that a possible standardization can only occur with the participation and approval of the indigenous teacher-students. It was with that in mind that instead of simply submitting, remotely, the units to standardization by a seasoned linguist, we opted for requesting a tentative-proposal for standardization that was accomplished in a especially participative manner, in presential meetings between linguists and teacher-students.

37. The problems at hand were built/formulated over perceptions deriving from our practice as teacher educators of indigenous teachers, students of the Superior Intercultural Formation Course of the indigenous teacher in the State of São Paulo (2005 – 2008). Therefore, for example, we are quite aware as well to other challenges in light of the perspective of going against the transdisciplinary system of the indigenous man and woman to build knowledge as well as an intercultural education seen as an instrument of inclusion and of attribution of power to the populations that are detached from the dominant culture.

### **A few considerations**

38. As educators/teacher educators external to the indigenous culture, we recognize that the questions and solutions of the indigenous context – resulting from the traffic through different contacts and, in general, validated by experience – are not easily perceived while problems and solutions for those who act as teacher educators in a scholar context, especially for the fact that we have been formed from knowledge and learning conceptions stand points such as those built in the academy – of universal character and context free.

39. To sum up, as educators/teacher educators external to the indigenous culture, we recognize the permanent need to: a) constantly problematize our ways of thought; b) argue around the middle way between the mystical and the logical thought; c) question the role and the meaning of the scientific knowledge and, d) recognize the diversity and the difference as positive factors.

40. So, in terms of finalization, we recognize as external educator/teacher educator the indigenous culture the necessity of a constant revision of the and among the sources, the texts and the speeches – of the indigenous and non- indigenous educators – by means of a thorough study of the knowledge involved, the representations and of the linguistic elements, common and non-common to both groups.

### **Bibliography**

ALANGUI, W. (2006) Mutual Interrogation as an Ethnomathematical Approach. [www.math.auckland.ac.nz/Events/2006/ICEM3/2.Prez%20Given/Prez%20given%20ppt/Alangui-prez.ppt](http://www.math.auckland.ac.nz/Events/2006/ICEM3/2.Prez%20Given/Prez%20given%20ppt/Alangui-prez.ppt)

BARTON, B. & ALANGUI, W. (2004). Ethnomathematics and Indigenous People's Education in [Educational Studies in Mathematics](#), Volume 56, Numbers 2-3, June.

CARVALHO, V. (2007). Mathematics education and society (MES): a constituição de uma comunidade de prática científica internacional. Tese de doutorado. Faculdade de Educação da Universidade de Campinas- FEUNICAMP.

D'AMBROSIO, U. (2002). Palestra proferida ao grupo de professores do curso Magistério Indígena Estado de São Paulo–MAGIND. In: “Um Caminho do Meio (da proposta à interação)”. São Paulo: SEE-SP/FEUSP.

D'AMBROSIO, U. (2001). Etnomatemática: elo entre as tradições e a modernidade. Belo Horizonte: Autêntica.

FREIRE, P. (1987). A Pedagogia do Oprimido. 17ª ed. São Paulo: Editora Paz e Terra.

FREIRE, P.(2002). Pedagogia da autonomia - saberes necessários a prática educativa conceito do leitor. Rio de Janeiro: [Paz e Terra](#) p. 127-8.

GRUPIONI, L.D.B. (2003). Experiências e Desafios na Formação de Professores Indígenas no Brasil. In: Revista Enfoque: Qual é a questão. Nº 76, p. 13-18.

HORSTHEMKE, K & SCHÄFER, M. (2006) Ethnomathematics and education: Some thoughts on the allegation of recent developments and current directions. [www.math.auckland.ac.nz/Events/2006/ICEM3/2.Prez%20Given/Prez%20given%20papers/Horsthemke2-paper.doc](http://www.math.auckland.ac.nz/Events/2006/ICEM3/2.Prez%20Given/Prez%20given%20papers/Horsthemke2-paper.doc)

MONTE, L. N.(1999). Formação de professores indígenas. In: Presença Pedagógica. V.5, Nº 26.

SKOVSMOSE, O. (2002). Foreground e As Políticas de Aprendizagem por Obstáculos. In: Etnomatemática: valor, papel e significado. São Paulo: Zouk. P. 99.

VITHAL, R & SKOVSMOSE, O. (1997). The end of innocence: a critique of ethnomathematics. In: Educational Studies in Mathematics. Springer.