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DISCURSIVE INTERACTIONS OF A SCIENCE CIRCLE OF THE PRÓ-JOVEM URBANO DA AMAZÔNIA: TALKING ABOUT ENVIRONMENTAL HERITAGE PROBLEMS

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ABSTRACT

We analyzed discursive interactions in the Science Circle of Pró-Jovem Urbano in the city of Vigia de Nazaré-Pará-Brazil, in which teachers and students talked about environmental problems in the place where they live. The didactic sequence that culminated in the conversation circle was tested as a methodology of Environmental Heritage Education by a researcher from the Master's Degree in Education in Science and Mathematics at UFPA. The dialogues constructed are discussed according to the categories of Monteiro and Teixeira (2004) and studies of Social Representations of Environmental Problems (Mazzotti, 1997). They show the attempt to overcome a sociocentric view to a socio-environmental perspective in which the subjects identify themselves as the environment. The results suggest that the use of discursive resources by the teacher can contribute significantly to the students' argumentation process. They point to the Environmental Conversation Circle as a legitimate teaching and learning methodology for the construction of meanings and identification of students with the environment.

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INTRODUCTION

The need to keep the environmental heritage of the city of Vigia de Nazaré conserved and accessible to new generations made us realize that one of the most feasible ways for this intent, in addition to the continuity of studies and research, is through a broad discussion about the environmental problems of the residents of the community shared in formal and non-formal education. characterizing what we defend is the object and task of Environmental Heritage Education in the Amazon and Brazil.

Environmental Heritage Education is understood as:

> The study of the environment from the perspective of Heritage includes biologically relevant characteristics of a place or region, cultural characteristics, customs, language, memories, folkloric and religious manifestations, architectures and buildings, and "the ways of being and existing" of the human population that resides there and interacts with the environment, of which it is part and legitimate representative, in their interactions with others, within the ecosystem and society, simultaneously. (Oliveira; Saints; Silva, 2008, p. 2)

In studies on Social Representations of the Environment in Vigia, social representation is a form of individual knowledge that only occurs with the "other", at the moment when social interaction occurs. The social representations found refer to the universe of opinions constructed by individuals about their city, according to the life history of each one (Moscovici, 2003; Barros, 2007).

This is one of the characteristics of social representations that allowed us to analyze the individual and collective meanings discussed during the dialogical interactions in the environmental education circle, which is also a moment of social interaction, where the environmental problems of the neighborhood, as the object of discussion, are placed according to the daily experience of each student.

Social representations are a form of knowledge, socially elaborated and shared, having a practical vision and contributing to the construction of a reality common to a social group (Jodelet, 1986 apud Sá, 1993). In this sense, Santos, Oliveira and Silva (2008), supported by Moscovici (2003), in a study also carried out in Vigia, affirm that social representations are at the same time a "product" of the social and a process of institution of this social, having, among other functions of elaboration, that of determining behavior and communication between individuals.

This other characteristic of social representation was used to try to understand how students are aware that their attitudes and practices are responsible for the state of

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conservation or degradation of the environment in which they live. Our conception of environmental problems is that they are understood as those situations where there is risk and/or social/environmental damage, but there is no type of reaction on the part of those affected or other civil society actors in the face of the problem (Carvalho; Scotto, 1995).

Our intention in this study is also to analyze possible representations of man as a cause of imbalances even in a context where there are no specific economic interests for the production of profits, that is, in their domestic activities and the family life of the students, with their neighbors and friends, there in the place where they live, their most proper and private environment.

Reigota (2001), in studies on the social representation of the environment, says that the idea that all human activities lead to environmental degradation is common. For him, three types of social representation that comprise the environment are common:

- **Naturalistic** – The environment is synonymous with untouched nature, where natural aspects are confused with ecological concepts (niche, habitat, ecosystem, etc.).
- **Anthropocentric** – A naturalistic view that highlights the usefulness of natural resources and recognizes the interdependence between biotic and abiotic elements and the transformative action of man on natural systems, altering the "ecological balance".
- **Globalizing** – Reciprocal relations between nature and society, highlighting the complex interactions between social and natural aspects, as well as political, economic, philosophical and cultural aspects.

In any case, whether due to disorderly urban occupation, as is the case of Igarapé da Rocinha, the neighborhood that surrounds this school and where many of the students in this conversation circle under analysis live, or due to greedy economic activities, the men responsible for environmental problems are always "the others" and the causes of the problems are always artificial, there is no identification of man as an environment.

Mazzotti (1997) says that there seems to be a sociocentrism in the responsibility for the damage caused to the environment at this point, that is, it is the fault of society, it is the fault of the businessmen, it is the fault of the inspection agencies, it is the fault of the residents, it is the fault of the neighbors, but there is no awareness of the individual, as a social being, of his responsibility.

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Mortimer and Machado (1996), referring to situations of cognitive conflict in the classroom, say that teaching cannot be seen simply as a simple process of equilibrium that would lead to the overcoming of previous conceptions and the construction of scientific concepts. The recognition and overcoming of contradictions necessarily go through a process of discursive interactions, in which the teacher has a fundamental role, as a representative of scientific culture. Thus, learning science is seen as a process of "enculturation", that is, the entry into a new culture, different from that of common sense.

It is exactly this type of transformation of thought, values and actions, of individual and collective responsibility, that we try to foster in this methodology of the conversation circle on environmental problems, it is this change from a naturalistic and sociocentric vision to a socio-environmental vision, which the discursive interactivities carried out here intend to help to build.

The evidence of studies focused on the processes of knowledge construction in educational activities has allowed a redirection of the look in qualitative research to the interactivity of teacher-student and student-student relationships, which Colomina, Onrúbia and Rochera (2004) call the "**theoretical and methodological leap**" caused by cognitivist and constructivist ideas. For these authors, the change from the process-product perspective to interactivity recognizes the educational influence in the progressive construction of systems of meaning shared between teacher and student, with gradual transfer of control from the teacher to the students, and they make known the potentialities that the analysis of these interactivities presents.

These authors state that constructivist models have an interpersonal and sociocultural character, which is why they are often defined as socio-interactivist, as they consider situational and contextual factors as inseparable components in the learning process. In them, teaching is not conceived as a simple transmission of knowledge, but as a social, linguistic and communicative process. The role of the constructivist or socio-interactionist teacher is to structure and guide the construction of meanings that students perform in a complex environment of activity and discourse, adjusting their help and support according to how students perform such construction.

For the analysis and understanding of the performance and argumentative speeches of teachers and students around a learning task such as the conversation circles, we decided to use the categories of Monteiro and Teixeira (2004), who in a study on physical knowledge in elementary school science classes created an analysis

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instrument that provided a greater detail of the teacher's actions in the search for a more refined and structured construction of arguments. part of its students, which enabled an understanding of different aspects related to interaction in the classroom. Thus, they structure table 1, which summarizes the characteristics of the teacher's discourse, which can indicate, with greater specificity, the category to which he belongs.

Table 1: Characteristics of the categories of the discourse of the teacher by Monteiro and Teixeira (2004) inspired by Compiani (1996) and Boulter and Gilbert (1995).

RHETORICAL ARGUMENTATIO N	SOCRATIC ARGUMENTATION	DIALOGICAL ARGUMENTATION
Contextualization Exhibition	Track supply Remodeling Remirroring Elucidation	Instigation Opposition Organization Recapitulation Reappointment Evaluative speech

Source: Compiani (1996) and Boulter and Gilbert (1995).

We agree and recognize the quality of this analysis tool for research on interactivity in didactic sequences, such as the one we propose to do in this work, so we decided to adopt it for this study, considering that in the dialogical interactions there was the effective participation of the teacher and the students, and that in the "heat" of the discussion, there are moments in which the hierarchical asymmetries seemed quite diluted, We chose to use this analysis pattern for teacher-student interactions, however, at times we found that it also fits student-student interaction.

At first, it seemed to us that the study of teacher-student interactivity is justified because it allows us to evaluate whether the Environmental Heritage Education wheel is moving in the desired direction and because of the possibility of knowing how interactions with colleagues and with the teacher contribute to the construction of knowledge and also because of the possibility of favoring the teacher's reflection to improve the practice.

METHODOLOGY

In this study we analyze the Discursive Interactions in a conversation circle of a didactic sequence, proposed as a methodology for Environmental Heritage Education by a researcher from the Master's Degree in Science and Mathematics Education of the Study Group in Environmental Heritage Education of the IEMCI of UFPA, in joint action with his advisor and a teacher from the Pró-Jovem Urbano of the City of Vigia de Nazaré,

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which is located in the northeast region of Pará, 97 km from the capital Belém, with an area of 386.61 km2 and a population of 41,500 inhabitants, where the largest fishing activity in the state takes place. The cultural scene has churches and chapels of eighteenth-century Lusitanian architecture, museums, markets and squares, and hosts intense religious and folkloric activity, such as the traditional Carimbó Dance.

The didactic sequence was composed of four consecutive classes, one per week, during May 2009, in a class of 25 students from the federal project known as Pró-jovem Urbano da Cidade de Vigia de Nazaré-PA, in a school near the Igarapé da Rocinha, at night, where 5 classes operate to serve 158 students who stopped their studies between the 1st and 8th grades of elementary school. aged between 18 and 29 years. The classes were photographed, recorded on video and MP3 and the dialogues of the conversation circle were transcribed for the analysis of the discursive interactions.

The activities followed the following order: **Lesson 1**: Importance of identity, historical documents and memories for social life, history, family, neighbors, friends, school, work and housing; **Lesson 2**: Collective reading with discussion of a text with definitions of natural, social, cultural environment and environment as heritage. Team building with students from the same neighborhood. Delivery of a questionnaire on the text for discussion in the next class; **Lesson 3**: Discussions about the questionnaire, in 4 groups of 6 students from different neighborhoods. The teacher marked the conversation circle with discussions about the questionnaire answered by the students; **Lesson 4**: Holding the conversation circle in the form of a circle with the students and the teacher sitting at school desks.

For data analysis, we adopted the tables of Monteiro and Teixeira (2004) for the categorization of teacher-student discourses. We also chose to analyze the construction of meanings concomitantly with the comments on the discussion of the categorization of discursive interactions, based on the Social Representations of Environmental Problems, using authors such as Mazzoti (1997), Reigota (2007), Carvalho and Scotto (1995) to discuss the "naturalistic", "sociocentric" and socio-environmental perspective, in the discourse of the students and the teacher, and to establish possibilities of overcoming it both in the discursive interaction during the circle, and to support and produce possible changes in the attitudes of students and teachers towards the environment in the communities where they live, a possible niche of environmental action, which is the main objective of the Environmental Education Circle methodology.

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RESULTS AND DISCUSSION

CATEGORIZATION OF THE MAIN TEACHER-STUDENT DISCURSIVE INTERACTIONS

(12) Sheila- I try to take what I discuss at school into my neighborhood and my home. I relate what I learn about the environment to my day-to-day life. Because if everyone does their part, we can change the future of the environment in which we live. (13) Teacher- Alan, do you have anything to contribute to Sheila? (16) Teacher- Do you? Put Paula there. (17) Paula- In my opinion, it is a real neglect. Why are there no ditches, no sewage? Some people do not collect garbage and do not dig their graves. (18) Teacher- Look at the problem that Paula has already given us, right... the issue of cesspools, ditches... I mean, not just coexistence, right? But where is she feeling it in her skin... what we are looking for. Pay close attention, it is your experience. It is your conviviality. (19) Teacher- Do you have anything to add Welesson? In that same first question. There is someone to add to Sheila's speech with Paula. (21) Teacher- So let's move on to the next question. Are there conversations about the environment in your family and neighborhood? Give examples of these conversations. Alan?... Sheila?

The teacher indicates who should contribute and what should be done, even asking. Then he begins to instigate the students to give their opinion (12,13, 16, 18,19), as in dialogical argumentation, going so far as to make a re-mirroring (18) characteristic of Socratic argumentation. But he does not make them feel free to express themselves and moves on to the next question (18 to 21), which is more consistent with rhetorical argumentation in contextualization. The student already reveals that she takes the environmental discussion from school to the place where she lives (12). Another student speaks of environmental neglect already with signs of sociocentrism (17).

(39) Teacher- Come on, Sheila. Look there, in your family and neighborhood... You spoke that day. You gave your contribution that day, didn't you? Look there! Are there conversations about the environment in your home, family and neighborhood? Give examples of these conversations. (41) Alan- ... Close to home does not exist. It doesn't exist because I've talked to the woman up close myself. She made a "munturo" that looks like the "Aurá's garbage dump" (teacher laughs). On the side, at the back of the backyard of the house. I said, because you don't take it off. This will cause a disease for your son or daughter. She said no, for me I can't even see. It will stay right there. If you are interested, take it off. (42) Teacher: And what is missing? What do you think? What is missing for people to have another view on this issue? From this problem, as you say... with your

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neighbor. (43)Sheila- He doing his part, right? (44) Alan- She doing her part, taking out the trash. That there he is bringing disease not only to her, nor to her family, she is bringing it... (45) Wellesson- But then you'll do your part... Leave your neighbor (interrupting Alan)(46)Alan- No, but I'll do it... (46) Welleson: You doing your part... (Trying to keep going)(46) Alan- I do, but the garbage that's there...

The teacher continues to instigate (39, 42) and makes a reappointment (39), clearly already in the dialogical interaction. This makes one student take the initiative and open the dialogue (41), followed by a student (43), and another student (45). The two students come into conflict, which shows that the teacher managed to get a counterposition (44, 45, 46). The sociocentric perspective of a student (41, 42) and a student (43) on garbage conflicts with the socio-environmental perspective of the teacher (42) and one student (45), which instigate a change of view (42).

(110) Teacher: Do you perceive yourself as the environment? Because it is very easy to throw stones at others, to say that the other is guilty. (111) Maria- Teacher, I pick up the garbage from the house and just throw it in the backyard and it falls into the woods, behind the house, near a little stream, which has other houses there... (113) Vanessa- (on the side) My house is at the back of her house! (everyone laughs) (114) Alan- Oh, are you hurting her... (Very emphatic)(115) Teacher- Because if she's the one who's after the forest, you're not only harming her, you're harming yourself...

The teacher continues to instigate and oppose in her speech(110) to achieve a new elucidation. Students enter the discussion(111). A new student enters the discussion to oppose her colleague(113), which becomes funny and shows a contradiction or incoherence of this colleague(114). The teacher achieves an evaluative speech(115). At the moment, all the subcategories of dialogic argumentation have been reached, which can allow for highly significant learning. The sociocentric view is well characterized in the statements(111, 113) of a neighbor who confesses to throwing garbage in the other's backyard as if she did not realize it. The question of identification with the environment begins to arise in the teacher's question(110, 115)) and in the student's(114) question there is still a strong sociocentric content.

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Table 2: Categorization of the Teacher's discourse

RHETORICAL ARGUMENTATION					
Exposure			**Contextualization**		
There was no			1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 18, 21		
SOCRATIC ARGUMENTATION					
Runway Supply		**Remirroring**	**Remodeling**	**Elucidation**	
65		22, 57, 60, 68, 102	60	80, 82, 84, 86, 88	
DIALOGICAL ARGUMENTATION					
Instigation	**Contrast**	**Organization**	**Recapitulation**	**Renewal**	**Evaluative Speech**
12, 15, 18, 19, 21, 42, 47, 86, 102, 110, 121	44, 45, 46, 80, 82, 84, 86, 88, 110	60, 125	125	39, 47, 55, 72, 74, 76, 78	115

Source: Monteiro and Teixeira (2004).

In dialogical interactions, we perceive general learning attitudes useful for rethinking our educational practices according to sociointeractionism and the socio-environmental perspective (Mazzottil, 1997; Reigota, 2001; Carvalho; Scotto, 1995).

The dialogical interactions in the conversation circle occurred, almost entirely, within the Socratic and Dialogical Argumentations, with a minimum of Rhetorical Argumentation. Even so, it was clear that all forms of argumentation were used. This seems to suggest that the teacher who uses different discursive resources ends up contributing more significantly to the process of argument construction by the students (Monteiro; Teixeira, 2004; Mazzotti, 1997, Mortimer; Machado, 1996).

CONCLUSIONS

The Environmental Conversation Circle was presented as a legitimate teaching and learning methodology for the construction of meanings in Environmental Education and in the process of building the identification of students with the environment. The Discursive Interactions of the **Socratic and Dialogic Argumentation types** made the hierarchical

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asymmetries between teacher and students tenuous, especially in moments where there was intense dialogical activity, with several students and the teacher participating freely. Thus, the possibilities of success of this methodology, which culminated in the Environmental Heritage Education round to prepare new ways of rethinking the change from the sociocentric perspective to the socio-environmental perspective, are encouraging and should be investigated in more depth.

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