Teaching Science in an Ethical Perspective-humanist: Narrative of a Didactic Experience at a Public School

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Abstract

In an ethical perspective-humanist science education should be aimed at promoting the political emancipation of the subject, and allowing him to develop a transformative praxis of the society in which it is inserted. In this article, we present an applied research developed in a public school in the city of Porto Alegre/RS in which aimed at the construction of a Science Museum in which the Biology and Integrated Seminar classes have been taught. Opts for employing a narrative approach to study and reflective in which presents some stages of the project development. The transformation of space in which classes were enabled to provide an environment conducive to the Exchange, the simplicity and humility. These latent virtues in practice observed allow the creation of a teaching process based on the ethos and commitment to transformation of reality in which the subjects are inserted.

Keywords: Science Education. Scientific Literacy. Praxis.

Introduction

Even though distinct theorizing about the sociology and epistemology of science pointed its social and historical character, in the sciences taught in the school curriculum, the idea of this as a dogmatic truth. By dogmatic stance, conceive knowledge as a human production or deposited total confidence in human reason and intellect (Germany, 2003). That stance in the face of the scientific knowledge becomes dormant, for example, when you need to teach Science as a product, without regard to its nature and epistemological socio history that this knowledge was produced. Thus, science is now conceived as universal truth, pure knowledge and produced through the rationalization of reality.

Teaching science in this perspective is to adopt a content posture, causing students to derive formulas and knowledge, being unable to contextualize the information they received. Science becomes content and something immaterial disjointed reality from the subject. It is believed still to teach science through Bank pedagogies which accelerate the process of dehumanization of the subject, as this would feel unable to act against such a great knowledge (Freire, 2011).

For this study, the assumption that science education should be targeted with an ethical and political commitment of the society. Education wouldn’t serve to adapt the means by which it is inserted, but enable him, through a critical conscience, develop a transformative action about this his assistant. The perspective presented the science teaching would be so geared toward development of Scientific Literacy (CHASSOT, 2003), i.e. for the empowerment of students so that they act with a transformative Praxis, releasing a naïve consciousness phase (FREIRE, 1981).

Transform the school education not only requires conceptual changes and changes in the chosen benchmarks, but requires, above all, the implementation of this curriculum. In this article we present a didactic and pedagogical project realized through applied research in a public school in the city of Porto Alegre / RS, in which we sought to provide a space in which science classes were taught anchored in ethical and humanizing objectives.

The study is organized in three four sections, the first being titled "teaching science and Political Praxis" appears and deepens the theoretical and philosophical foundations of the proposed work. In the next part presents the context in which the proposal has been held, as well as the methodology used for this study. Later, in the section "Didactic Narratives: constructing a Science Museum" presents the process of construction of the Science Hall in the school space and the stages of the project. It ends up presenting the article as such an undertaking made possible the establishment of a dialogic relationship at school and how this relationship contributes to the awareness of the subject.

Teaching Science and Political Praxis

The humanization, to Freire (2011) consists of an ontological individual human vocation, since all aspire to and yearn for values such as justice, freedom and the recovery of their own humanity. However, the Brazilian educator analyzes that the Bank pedagogies steals the critical capacity of the subject, i.e. dehumanized him, causing him to have no more claim to free himself, but to identify with the oppressor. For Freitas and Freitas (2015, p. 2) adherence to the oppressed project "turns out not to allow self-consciousness." The individual is thus in a naïve consciousness level, in which the interest of the individual “boils down to survival, and consciousness
only exists in function of the biophysical imperatives of this survival" (LOYOLA; Borges, 2013, p. 297). Freire (1981) studied in its social and historical period, the majority of the Brazilian population stood at that level of consciousness. The education of the period, before enabling break with this perspective, reinforced through a mechanical and transmissive education.

The educational practice should make a political commitment to transform reality, which implies developing an ethical attitude and committed to the transformation of reality and the emancipation of the subject. About that says Freire (2000, p. 47):

*The educational practice [...] is something very serious. We deal with people, with children, teenagers or adults. We participate in their training. Help them or damaging them in this quest. We are intricately linked in their knowledge. We can compete with our incompetence, bad preparation, irresponsibility, for his failure. But we can also, with our responsibility, and like teaching scientific preparation, with our seriousness and witness in the fight against injustices, helping learners become striking presences in the world.*

On freiriana design, it would fit to a teacher, through the establishment of an exchange relationship with the subject, create the necessary conditions so that he develops an epistemic critique of reflection reality in which it is inserted and thereby promote their critical awareness. For Oliveira (1996, p. 44) criticality would occur only when the man take self-awareness and it took as an active subject in their own history. Thus, the critical education is an action-oriented Praxis, in which carries "a transformative action consciously and criticism of reality, overcoming the dichotomy between theory and practice" (Freitas, Freitas, 2015, p. 2).

Suggesting a connection between the Freire (1988, 2011) and Santos (2011), highlights the need to promote a knowledge-emancipation that aspire to develop a "translation theory to serve as epistemological support to emancipatory practices" (SANTOS 2011, 31). However, what is observed is that modernity was marked by a knowledge-regulation - the science - that instead of collaborating with the development of a critical consciousness, produced a marginalization of the subject and its cultural apathy (Laraia, 2008).

Thus, scientific knowledge rather than enable the man to demystification of their world and become intimate with the reality that it is wrapped produced an axiological hierarchy, overriding all other ways of reading and understanding the world (Chassot, 2003; Moraes, 2003). The Ministry presented in this school and the curriculum manuals, rather than deconstruct these assumptions, the increases since it presents scientific knowledge, often as product without contextualize it to the social and historical milieu in which it was drafted.

Science then becomes seen as ineffable wonder, able to understand the universe in all its entirety. The man, common man, is faced with something so grand and not understand the nature and epistemology of scientific knowledge undergoes it. Instead of a subject of the emancipation process, scientific knowledge, seen as knowing regal, subjecting the individual to it, producing a new alienation.

It is expected that the Science opportune the subject one protagonist action on the means by which it is inserted is necessary to relativize the way we understand scientific knowledge. The people can not act solely on the ground since making policies and based on an ethics of otherness decisions should be local actions and susceptible to emotional, cultural and social values. One should realize how the world does not consist of a finished reality or support of existence, but rather the context of human existence and therefore an existential and cultural reality (Freire, 1988; Andreola, 2010).

We thus, recognize that teaching sciences consists of a political venture, in which you can choose different options, including teaching her how to tell or promoting a dogmatic science education review. Subjectively opts for the second option, since it is believed that the hope for Scientific literacy of the subject it is expected that this is rooted "in an ethical and political project that dignificas e widen the possibilities of life and of human freedom" (Giroux, 1990, p. 2). Thus, science education must be directed towards the promotion of a knowledge which aims to enable the individual emancipation a critical reading of the world in which he is inserted and a transformation that dignifies his existence.

**Methodology**

In this article we will tell a didactic and pedagogical project conducted in a public school located in an outlying neighborhood of the city of Porto Alegre / RS. From this perspective, employed methodological approach is a narrative in which the author's present applied research developed. Along with the narrative, we propose a reflective exercise in which we analyze situations and project milestones.

It is noteworthy also that the survey was conducted in a State Institute of Education, which adopts since the year 2011, the Polytechnic High School. The curriculum of this educational institution has been modified in order to include the Integrated Seminar and Projects. The project developed curriculum was developed with five classes of 1st year of high school. To develop the project stresses also that followed the didactic guidelines of the School Museum Implementation Manual (Barcellos, 2013).

**Didactic Narratives**

At the beginning of the school year the project proponent teacher held with their students exhibit in which presented the history of humanity and of scientific knowledge. It is noteworthy that the lecture that marked that first time, consisted of a maid teaching strategy.

A teaching strategy, unlike a curricular approach, are a series techniques used by the teacher to achieve specific goals. In our case, this was to enable students to recognize the scientific knowledge as a social and historical production, ie as a way to understand the nature produced by the man himself, thus demystifying its supposed purity, transcendented and universality. Is an initial action to empower the student,
since to understand science as human production, recognizes as fallible and is acknowledged as a possible producer of knowledge. From that moment on, it is up to the students to prepare questions that became their main points of research. Points out that these are emerging from the reality of the students.

This action research on the reality and their educational potential are recognised for authors that deal with the research participant. Oliveira and Oliveira (1984, p. 19) highlight that this approach "the study of the reality experienced by the Group and their perception of this reality is the starting point and the raw material of the educational process" (Oliveira; Oliveira, 1984, p. 19). The deal with reality and become intimate with her, let the guy know it and know the origin of the phenomena that occur there. It is from that that you can deploy an intervention action. However, for this to occur it is necessary to go beyond questioning naive, it is necessary to become this epistemic questioning, seeking thus to understand the social nature of the problem.

That’s when we advance to the second phase of the project in which to understand a problem, looking up references and theoretical information. In a society that information is scattered in a network, it is necessary that the teacher orient students to gestate this set of information, selecting the Science of Pseudoscience, philosophical and metaphysical knowledge of dogmatism, and the popular fundamentalism knowledge. Thus, it provides students with a collection of materials for them to build a theoretical foundation for his work.

At this stage of the work that dematerialises up the space of the classroom, attending museums, universities and exhibition in which students can contact professionals who will assist in developing the work. In the above design, there is two trips made, the first of which went to the Museum of Science and Technology of PUCRS and the Oceanographic Museum of FURG. In addition, there were a series of lectures at school, with different professionals, including chemists, researchers and oceanologist.

After the formation of a theoretical corpus, students began planning the construction of a scientific model that would allow the understanding of reality. Justified the study of reality, the ideas of the pragmatist philosopher Hume (2013). For him, abstractions and theories carried out, are made more complex perceptions that comes from experience and phenomena which the subject experiences.

In this sense, the production of models aims to promote understanding and learning of the subject. It is noteworthy that a scientific model, as Chassot (2003), does not consist in a scientific demonstration, but in a product that allows you to observe in a simplified way the phenomena occur. These were scientific models produced by students who are now part of a collection of the School of Science Museum.

In a last moment there was the data synthesis task that had been obtained. At this stage of the research, were produced banners exposed in II Shows Scientific and Cultural the State Institute of Education Paulo da Gama and these were evaluated by researchers and practitioners in the area of education.

Final Considerations

The centrality of Paulo Freire's Pedagogy Liberating is the dialogical relationship. For the Brazilian author is only by Exchange that makes it possible to reach the most critical levels of consciousness. However, we believe in the educational relationship dating space exerts a major influence and can they become a difficult affective relations or enhancers. In this perspective, for this study broke the assumption that the traditional classroom, marked by individual work by the ubiquitous pulpit and one-way flow of knowledge is unusual for the development of a dialogue permeated by virtues like loveliness, trust, humility and respect.

Accordingly, this section waxing our study, we will seek to present as the modification of the environment led to changes in the types of relationship that occurred in it, and above all, the intensity of these relationships. In a traditional education, in which the teacher teacher, narrates and describes about a reality, there is an overlap of different ways of seeing the world (Freire, 2011), in which the students are seen as erroneous understandings. In a relationship of dialogue, teacher and student are placed in the same hierarchical level, in which both are designed as human individuals and subjects that are transcendent and are in the world (Freire, 1981). It is acknowledged that before they are biological or rational individuals consist of social and cultural beings that share with a certain group a peculiar mode of understanding the world and a set of beliefs and values that make up the substrate.

The dialogue between both becomes seen as an encounter of cultures in which both understand the validity of your way of seeing the world in conceiving as “a middle ground between the temerity Dogmatics and the despair skeptic” (Germany, 2003, p. 43). In a dialogical relationship with another individual is acknowledged as the author of an understanding and consequently, it empowers, thus becoming the author of his own existence. In the project that we follow, so that movement of transformation of naive curiosity in an epistemological curiosity. The initial naivety or elementary questions, when extensive and systematic knowledge-related allowed the subject to understand the reality of this inserted in other ways.

References


