

Parallel Session 28: Discourse analysis contributions to PCST study

**ASTRONOMY TEACHING AT THE HIGH SCHOOL LEVEL FROM A
HUMANISTIC APPROACH**

Gilvana Benevides¹ Luiz Carlos Jafelice^{1,2}

¹ Graduate Program on Natural Sciences and Mathematics Teaching, Rio Grande do Norte Federal University (UFRN). Rua São José de Mipibu, 1468 Lagoa Nova 59063-070 Natal-RN Brazil, Tel./Fax 55-84-231 82 62, E-mail: gibenevides@yahoo.com.br

² Physics Department, UFRN, E-mail: jafelice@dfte.ufrn.br

Abstract

The astronomy teaching is usually excessively technical and dissociated from the human aspect that feeds the great interest and curiosity that those themes arise. In this work we present a proposal aiming to contribute to revert such a picture. For that purpose we choose as opening issues the different views of the Universe: naïve, autochthon, and scientific. We develop practices, instructional materials and texts to make the adoption of a humanistic approach feasible to the astronomy teaching at the high school level. We applied our proposal in an in-service teacher's training course and the receptivity and results were very stimulating.

Key words: High School Education; Humanistic Approach.

Text

Introduction

There is an enormous shortage of astronomy didactic materials for high school teachers that particularly explore humanistic aspects of that subject. The origin of the Universe is a good example of that central conclusion. Although such an origin has had diverse cultural explanations, teachers usually do not have information about, besides lacking material to work on different world views and appropriate training to lead a proper classroom approach to those cosmogonic explanations.

Objectives

Our project in education must be seen as a practical trial to help the effective formation of citizens more integrated with themselves, the environment and the society they live in. Our aims go beyond a verbal and experimental astronomy

content for high school teenagers. The project intends to integrate activities that are play oriented and at the same time develop cooperation qualities and skills, respect for the others, respect for their opinions, besides including corporal activities (vivid and theatrical activities), going beyond plain physical concepts.

Methods

In this manner, the challenge of this project was to introduce other aspects of the human being into the learning of physics, in particular astronomy, which usually are not considered because of the adoption of excessively technical and mathematical approaches in exact sciences teaching.

Following what Howard Gardner has proposed (cf. Armstrong, 2001), we see that the human being has different intelligences. Those are cognitive capacities that allow the individual to learn and interact with the world. Therefore, there are other ways of learning besides the rational form, and those ways should have appropriate practices involving them within a discipline or among the disciplines traditionally present at the high-school level of formation.

We develop practices, instructional materials and texts to make the adoption of a humanistic approach feasible to the astronomy teaching at the high-school level, an approach in which the humanistic and scientific cultures could be integrated in a contextualized and efficient way for that level of teaching.

Results

We further criticize the fragmental, positivistic, individualistic and competitive model of education that is so common in most high schools. Such an educational model is more worried with the selection of students to enter university than with their formation as a person. In our view, fragmentation only brings more fragmentation and this puts the individuals apart from the society they live in.

We propose the opposite, the integration and cooperation between the individual and herself/himself, the others and the society. In order for this to happen our “trick” is to put together classes involving the recovering of cultural contents. For that purpose it was chosen some indian cultures to enrich the teaching of astronomy, to compare with the Greek astronomy.

The objectives are to stimulate the comprehension of how different people elucidate the same phenomenon and also to make explicit the human being capacity of elaborating models: religious, philosophical or scientific. Each one attending one aspect of the human being, without the possibility of choosing the best, because the model has something transitory in its structure that the school unfortunately does not work with. Schools adopt the (current) scientific model as if it was the absolute truth when, in reality, we already learned from history of science examples that models are usually replaced by others.

Among other things that our project works with, we point out the following activities: 1) The sky representation made with paint sprinkled on a paper, showing that the formation of the constellations is, in reality, the look we give to those random spots, to form figures that make sense for our culture; 2) The theatrical activity with texts of different cultures and times [Brazilian Tupi-Guarani indians; Indian “Nasadasiyasukta” of the Rig Veda; Biblical Genesis; and a scientific one (Big Bang)]; this activity involves the body as an expression vehicle of learning, and highlights that the knowledge construction is made through models; and 3) The Brazilian Tupi-Guarani dance of the IEAOUY shows how another culture enters into connection with sky elements not standing off from them but considering themselves as children of the Sun and the Moon, and how this conception creates a less aggressive view for nature.

We point out the following results from that educational experience: The production of activities guidelines; The development of specific pedagogical practices (e.g., myth staging; indigenous Guarani primordial dancing; constellations "creation" and multicultural interpretations; etc.); and Concrete suggestions for the effective accomplishment of a contextualized and interdisciplinary teaching practice, where cosmogonic questions serve as an inspiration to motivate and initiate such a practice.

We applied our proposal in an in-service training course for public school teachers of several subjects. Their receptivity to that approach and the educational results obtained were very encouraging. They clearly indicate how the adopted approach may train teachers for world readings that naturally include cultural, social and historical aspects within the usual curricula subject themes to be taught. [See Benevides and Jafelice (2004) for further comments].

References

Armstrong, Thomas (2001). *Inteligências Múltiplas na Sala de Aula*. Porto Alegre: Artmed.

Benevides, G. and Jafelice, L. C. (2004). In preparation.

