

“Environmental Sustainability” in Portuguese textbooks

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Abstrat

The sustainable development is the principal issue of the society contemporary, in order to have a future. We have to care about the resources to avoid their over exploration and to protect the nature, not only for the human but also for the other living beings. The aim of this study is to analyse in Portuguese textbooks the item *Sustainability* which is associated to the conception – “*Relation of humans in respect to nature*” and its relation to the topic “*Human-Nature*”. Our results show that not much emphasis is given to ecological, social, and economic sustainability in science and geography textbooks. These results from text analysis are in accordance with the ones from images related to human and nature. In this context we observed that the higher number of images concerns human activities in the context of the human management of the environment. These findings show that if we want an education for sustainability, which is stated in international official documents, textbooks should be changed in order to introduce more information about sustainability and promote students’ citizenship.

1. Introduction

The contemporary society lives a crisis related with several problems where we can highlighted the pollution problems and the resources over exploration, as the Brundtland Report refers “... the sustainable development answer to the present needs without compromising the possibility of the next generations...” (Mckeown *et al*, 2002). So, “learning for sustainability” is a goal for citizenship education. In a broader interpretation, sustainability should be viewed as an interconnection of ecological sustainability, economical development and societal development. Accordingly, people’s environmental competences not only comprise concrete knowledge and skills but also involve situational components: awareness of different attitudes and values in a

particular society, ability to act on the basis of rules and norms of the ecologically sustainable community. We can consider that the strongest challenge today is to reach a sustainable development, which attempts to reach the equilibrium between the socio-economic development and the preservation of the environment (Gomes, 2006).

The aim of this work was to analyse the didactical transposition of “Use of Resources”, in the educational system. The didactical transposition analysis makes it possible to understand why certain scientific contents are or are not taught (external didactic transposition – EDT) and, when they are on the programmes, how they are taught (internal didactic transposition – IDT). The references about what should be transposed to the teaching situation are not limited to the scientific knowledge, they also include the social practices (evident in professional training, or related to the citizenship education in school) and the values system that some times are not clearly expressed but implicit (principle of precaution, of responsibility, between others) (Clément, 2006). The present work intends to identify, in Portuguese textbooks, the item *Sustainability* which is associated to the conception “*Relation of humans in respect to nature*” and its relation to the topic “*Human-Nature*”.

2. Methodology

The corpus of this study was composed of 6 textbooks containing the topic “Use of Resources”. The textbooks analysed were for the grades 3, 8, 10 of Biology disciplines; and for grades 7, 9, 10-11 of Geography.

For the textbook analysis it was used a grid constructed by the European FP6 STREP project Biohead-Citizen (CIT2-CT-2004-506015) for the *Sustainability* within the conception *Humans as guests of nature and environment versus Humans as owners*, by looking at the items “*Ecological sustainability*”, “*Social sustainability*”, “*Economic sustainability*” and “*Ecological-Social-Economic sustainability*”. We also used another grid: *Human and Nature* in particular *Images illustrating human management of environment*.

3. Results and Discussion

3.1 Proportion of “Use of Resources” in Portuguese textbooks.

The analysis of the textbooks showed that inside the general theme: Ecology and Environmental Education, the topic “Use of Resources” is the second more referred after the Pollution topic, as it can be observed in figure 1.

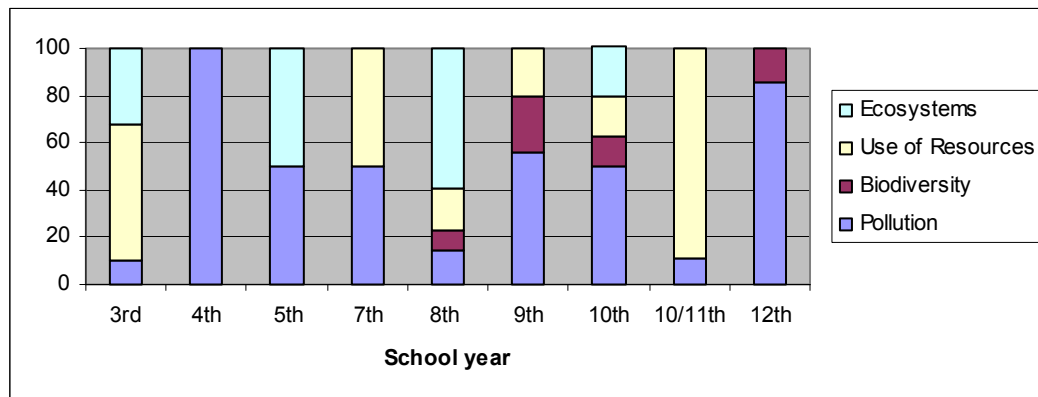


Fig.1: Percentage of use of resources topic in relation to the 4 sub-topics

3.2. Analysis of Use of Resources conception

In the sub-topic Use of Resources, we analysed *Human as owners of nature and environment vs Human as guests*. This conception aims to understand how man is seen in relation to nature in the analysed textbooks. Within this conception there are several indicators that reveal how human beings are placed in the environment:

➤ ***“Human as owners of nature and environment vs Human as guests” conception***

- Planet as an un-limited resource vs resources as a limited resource
- Planet as a resource to humankind vs planet as a resource shared with other living beings;
- Human benefits vs ecological benefits in evaluation of the impact, costs, priorities;
- Emphasis on the attainment of economic aims vs social, cultural, ethical, aesthetical aims;
- Unlimited trust in science and technology solutions vs principle of precaution;
- Focus on protection in the management of nature vs limits and control in the use of natural resources

In this particular conception, *Relation of human in respect to nature*, we looked at the Sustainability, by using the following indicators:

- Ecological sustainability
- Social sustainability

- Economic sustainability
- Ecological-Social-Economic sustainability

We observed that two textbooks of Science (3rd and 8th grades) and one of Geography (7th grade) refers this aspect of sustainability. All the other ones do not refer it, not even in images. The textbook of the 3rd grade of Science refers to ecological sustainability (two images) and economic sustainability (one text occurrence).

In the 8th grade Science textbook the occurrences in text refer to ecological sustainability only, suggesting that it is the only important aspect in sustainability. The social aspects, once again, are not relevant in Portuguese textbooks, as we have observed in previous studies (Tracana *et al*, 2007).

It is interesting to refer that of the three geography textbooks, we only observed occurrences of this item (sustainability) in one textbook (7th grade) These textbooks show many references to the Use of Resources, but only to which kind of resource, where they appear and their utility. The item sustainability that appears in the only textbook (7th grade) has references to ecological, economic and social aspect. It probably compromises the aim of environmental sustainability which is so important nowadays (Almeida, 2002; Woollcombe, 2002; Jacobi, 2003).

The discourse of environmental sustainability has turned to manage the effect of technologic improvements and economic interests related to environmental degradation of exploration of raw material and also in the perspective of the production of waste (Oliveira & Bizzo, 2005). According to Sachs (1993 – referred by Oliveira & Bizzo, 2005), to reach environmental sustainability it is necessary to consider simultaneously:

- i) social aspects*, with the goal of reduce distance between life pattern of social groups;
- ii) economical aspects*, made possible by an efficient allocation and management of the resources, much more under macro social criteria than micro social entrepreneurs and by regular flow of public and private investment;
- iii) ecological aspects*, involving measures to reduce the resources consumption, and residual production, measures to intensify research, to introduce clean and resource saving technologies, and to define rules that allow an appropriated environmental protection;
- iv) spatial aspects*, looking into a more balanced configuration of the rural-urban issue;
- v) cultural aspects*, in order

to get endogenous conceptions of involvement that respect the peculiarity of each ecosystem, each culture and each place.

3.3 Content of images: Human - Nature

In this context we analyse the item *human management of environment*, which is related to a real understanding of the importance to protect the different ecosystems. We observed that the highest number of images in the science textbooks appear, once again, in the 3rd and 8th grade, and is related with *human activities* instead of images *from natural environments, urban environment and rural landscape*. This fact show an accordance with the results obtained from the conception *Relation of human in respect to nature*. In the geography textbooks we could also observe that the item more referred is *human activities*, but in a lesser number than in the science textbooks. Another fact is that the highest number of occurrences of images appears in the 10/11th grade which is in discordance with the results referred previously. This shows that these textbooks do not give much emphasis to sustainability. As a matter of fact, geographic education has a major contribution in Environmental Education, promoting pupils' awareness about the impact of their own behaviour, giving them scientific and technical information and helping them to develop competences for decision making in relation to their environment (Alberto, 2002).

These results lead us to conclude that there is not much emphasis in ecological, social, and economic sustainability in science and geography textbooks. There is no emphasis on the attainment of economic aims or social, cultural, ethical, aesthetical aims and there is no preoccupation with the protection in the management of nature. These findings show that if we want an education for sustainability, which is stated in international official documents, textbooks should be changed in order to introduce more information about sustainability and promote students' citizenship.

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