How is the Term *Environmental Education* Linked on the Internet? A Study of its Representation on the Web Environment

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Introduction

Environmental Education (EE) gained importance after the Conference on Education, in the United Kingdom, in 1965, when the term was coined as a means to designate conservation or applied ecology (Dias, 2004). This first approach has experienced several paradigmatic changes, as a consequence of the negative impacts of human activities in the environment. Hence, the current concept of EE embodies a wide and complex meaning, that includes not only aspects related to health, biology and environment but also cultural, socioeconomics, politic, pedagogic and humanistic issues.

After twenty years of existence, Internet emerges as one of the most powerful media to disseminate knowledge and to form networks in different fields and subjects, like EE. Thus, how is *Environmental Education* perceived on Internet? What are its most frequent concepts on Internet? In order to answer these questions, we started a research project based on webometric techniques. In this paper, we present a pilot study on Portuguese language websites related to the term "educação ambiental" (Environmental Education in Portuguese). With this preliminary data, we believe we may contribute to the discussion of how a specific and complex network, as the network on EE, is constructed in web.

Methodology

Webometrics is a research field devoted to understanding the structure and the use of Internet information. According to Thelwall *et al.* (2005), the main webometric analyses are: web page content, web link structure, web usage and web technology.

In order to identify Portuguese language websites related to the term Environmental Education, we have opted to use the Google's search operator, *allinanchor*. This operator restricts the results to pages that receive inlinks with the specified anchor text (in our case, "educação ambiental") as hyperlink texts. In this sense, the results of such query are pages that are externally recognized as related to the studied term. The following picture summarizes this query search process.
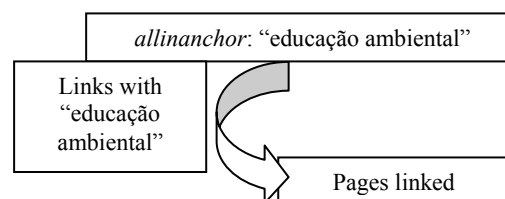
Scheme 1: Allinanchor search process

The use of *allinanchor* search operator allows finding pages cited by the anchor text (i.e. linked by other pages that have links with the term "educação ambiental"). The results are ranked by Google's PageRank algorithm (Brin & Page, 1998). Hence, the list of pages obtained through this query encloses more authority and recognition, since they were referenced by other pages as been related to the specified term. This contrasts with the most used method to study websites related to terms on the web: searching keywords directly through web search engines (examples: Rousseau, 1999, Bar-Ilan, 1999, Prime *et al.*, 2004). This approach gives a list of WebPages containing the term, but not necessarily recognized as related to it.

The search query used was Google's *allinanchor: "educação ambiental"* by February 05, 2009. As for the qualitative analysis and sites' categorization, we have first collected and organized the data in an Excel table. Then, we started classifying the sites according to the following categories:

- Types of sites: government, NGOs, private enterprises, association, foundation, personal, project/program, scientific article, etc (Vaughan *et al*, 2007).
- Site approach or activity: research, education, extension;
- Content on EE: theoretical, photo/pictures, short news/information;
- Conceptual or social representation of Environment: naturalist, anthropocentric or integrated (Reigota, 1995).

Results

This pilot study is based on data retrieved from 837 Portuguese language sites/pages (pages linked in scheme 1) with the term "educação ambiental" (EE

in Portuguese) that are linked by other sites as EE. A preliminary analysis indicates that the in terms of types of sites, EE sites are mainly associated with Brazilian research groups registered at the Brazilian National Council for Scientific and Technological Development (CNPq) database (21%). They are also associated with state government actions (11%), Brazilian network EE organizations (9.5%), advertising pages of EE courses (8%), private universities (7%), private enterprises (5%), pages with scientific articles and short texts on EE (3.5% each), public universities (3%), federal government actions and NGOs (2.7% each), newspaper and general pages (2% each) and projects/programs on EE (1.7%). These categories totalize 82.5% of the analyzed sites linked by others. The remainder (17.5%) was dispersed on other shorter categories or could not be accessed (Table 1).

Table 1. Types of sites linked by the term EE

Types of sites	n	%
Brazilian research groups (CNPq)	173	20.7
State government actions	92	11.0
Brazilian Network EE organizations	79	9.4
Advertising pages of EE courses	66	7.9
Private universities	56	6.7
Private enterprises	42	5.0
Pages with scientific articles on EE	30	3.6
Pages with short texts on EE	30	3.6
Public universities	26	3.1
Federal government actions	23	2.7
NGOs	23	2.7
Newspaper pages	18	2.2
General pages	18	2.2
Projects / programs on EE	14	1.7
Sub Total	**690**	**82.5**
other shorter categories	127	15.1
not accessed	20	2.4
Sub Total	**147**	**17.5**
Total	**837**	**100**

A quickly analysis upon the approach reveals that EE sites present often a focus on the development of education programs and community projects, which we named as sites with an approach in extension activities. These programs or projects try to inform the society (conventionally through the schools or not) about environment issues in order to form a common environmental culture and promote changes of the public behavior.Also this initial analysis points out to the predominance of an integrate concept of social representation of environment; the one that is associated with the relationship between human, society and nature.

Discussion/Conclusions

Environmental Education is a subject that is been gaining a worldwide importance in recent times due to humans' attitude towards environment. In Brazil, the national law nº 9.795/99 (Brasil, 1999) establishes the guidelines for the national politics on Environmental Education. Moreover, it foresees that public and private organizations may promote and participate on educative process related with this subject, included the mass communication media. Thus, understanding EE through such a powerful media, as Internet, may be of interest not only for educators but also for governments. Although, our analysis presents preliminary data of a narrow sample, we may consider some interesting features. EE is a subject of a large diversity of types and seems to be an issue of a general interest among the studied Portuguese language websites. This pilot study is on the way to be concluded. Together, its findings and methodology will be the basis of following studies to be carried out on English language websites linked, or in other words, recognized by other sites as EE. The set of findings will give subsides to the discussion of how a specific and complex network, in this case a network on EE, is perceived and constructed on the web.

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