

Title

Relation between marine environment and quotidian: what are the spontaneous concepts of students?

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Abstract

Most of the threats to marine biodiversity are in the coastal zone and are a direct result of demographic trends and pollution. The populations increase pressures on utilization of resources in coastal areas and in addition lead to habitat degradation. Many of the largest cities in the world, where population growth rates are highest, are near the coast (e.g. São Paulo, Brazil). Especially in these areas, a plan for coastal conservation is need. It includes, beside another things, coastal area management and environmental education. As a first step to elaborate an environmental education project, we investigated the marine environment (ME) spontaneous concepts of 12 to 14 years old children. Collect data instrument was a questionnaire with open and close questions. It was answered by 34 students from a São Paulo city school. When we asked what is environment, most children showed a romantic-naturalistic view of environment (e.g. "Is a beautiful place, with a lot of nature"). Few of then included humans, trash and city as part of environment. When asked to choose the tree thing that they remember when thinks about ME, the most cited answers were: living beings, nature preservation, beauty and curiosity. The marine organisms that students most remembered about were: fish, shark, whale, seaweed, sea horse and dolphin. To the students, the main reason to conserve ME is the living beings that are there. They declared a high interest degree about ME, but medium and low knowledge about it. 80% of the students think that there are not relation between marine environment and their quotidian. To the others, the alimentation is the main relation. These results indicated that students assume a utilitarian view of ME when they think about their on quotidian. However, they have a romantic-naturalistic view when the think about ME in general. This research highlights the necessity of education approach that focus on the development of a global view of environment.

Introduction

Most of the threats to biodiversity are in the coastal zone and are a direct result of human population and demographic trends. This idea is supported by a number of reviews focus on these threats: habitat loss; global climate change; and overexploitation (e.g. LUNDIN and LINDEN, 1993). The world population has more than doubled since World War II and is expected to increase more. The demographic trends of increased population densities in coastal areas are a special preoccupation. It is estimated that 67% of the global population lives on the coast or within 60 km of the coast and the percentage is increasing. Furthermore, many of the largest cities in the world, where population growth rates are highest, are near the coast (e.g. Sao Paulo, Shanghai, Hong Kong, Manila, Jakarta). These burgeoning populations increase pressures on utilization of resources in coastal areas and in addition lead to habitat degradation, fragmentation and destruction (GRAY, 1997).

Especially in these high population areas, a plan for coastal conservation is need. It includes, beside another things, coastal area management (CHAN, 2008) and environmental education (BERCHEZ *et al.*, 2005).

A critic point to develop environmental education projects, including those related to marine ecosystems, are the establishment of a definition for Environment. Many educational researches are investigated this concept, as well as attributing different views for it (SAUVÉ, 1996; BEZERRA and GONÇALVES, 2007; FLORES and GONZÁLEZ-GAUDIANO, 2008; MALAFAIA and RODRIGUES, 2009). We summarized the main views at Table 1.

Tabela 1. Views of environment (SAUVÉ, 1996; BEZERRA and GONÇALVES, 2007; FLORES and GONZÁLEZ-GAUDIANO, 2008; MALAFAIA and RODRIGUES, 2009).

Category groups	Authors
Romantic-naturalistic view - Nature to be appreciated, respected and preserved	Sauvé, Malafaia and Rodrigues, Bezerra and Gonçalves.
Naturalistic-reducionist view - Biotic and Abiotic parts of ecosystems	Flores and Gonzalez-Gaudiano, Malafaia and Rodrigues, Bezerra and Gonçalves.
Utilitarian view - Source	Sauvé, Flores and Gonzalez-Gaudiano, Malafaia and Rodrigues, Bezerra and Gonçalves.
Restrict view - Place to live	Sauvé, Flores and Gonzalez-Gaudiano.
Problem view - to be solved	Sauvé, Flores and Gonzalez-Gaudiano.
Global view - relation between human beans and nature	Sauvé, Flores and Gonzalez-Gaudiano, Malafaia and Rodrigues, Bezerra and Gonçalves.

We believe that environmental education programs may focus on the development of a Global view of marine environment. However, before it, we need to know what the current views of participants are. As a first step to elaborate an environmental education project focus on marine environment for São Paulo city schools (Brazil), the aim of the present case study was to investigate the marine environment spontaneous concepts of 12 to 14 years old children from this city.

Material and Methods

Collect data instrument was a questionnaire with open and close questions. We chose 8 of these questions to elaborate the present case study (Table 2). It was answered by 34 basic education students from a classroom of a São Paulo city school (12 to 14

years old). The answers were analyzed by categorization as described in Strauss and Corbin (2008).

Table 2. Collect data instrument – Questionnaire.

1. What is environment?
2. Mark the elements that are part of the environment. You can choose as many as you like. <input type="checkbox"/> animals <input type="checkbox"/> plants <input type="checkbox"/> human beings <input type="checkbox"/> furniture <input type="checkbox"/> plantation <input type="checkbox"/> city <input type="checkbox"/> sea <input type="checkbox"/> trash <input type="checkbox"/> mountain <input type="checkbox"/> river and lakes <input type="checkbox"/> dams <input type="checkbox"/> other: _____
3. When you think about the marine environment, the 3 first words or expression are: <input type="checkbox"/> entertainment <input type="checkbox"/> pollution <input type="checkbox"/> food source <input type="checkbox"/> religion <input type="checkbox"/> fear <input type="checkbox"/> cleaning <input type="checkbox"/> knowledge <input type="checkbox"/> work <input type="checkbox"/> curiosity <input type="checkbox"/> boring <input type="checkbox"/> disinformation <input type="checkbox"/> living beings <input type="checkbox"/> sport <input type="checkbox"/> trash <input type="checkbox"/> beauty <input type="checkbox"/> fun <input type="checkbox"/> health <input type="checkbox"/> disease <input type="checkbox"/> cool <input type="checkbox"/> nature preservation <input type="checkbox"/> other: _____
4. Write 10 marine organisms.
5. Do you think that is important to preserve the marine environment? <input type="checkbox"/> Yes. <input type="checkbox"/> No. Explain your answer.
6. Is there any relation between your quotidian and the marine environment? <input type="checkbox"/> Yes. <input type="checkbox"/> No. If you chose “Yes”, explain your answer.
7. Your interest about marine environment is: <input type="checkbox"/> very high. <input type="checkbox"/> high. <input type="checkbox"/> medium. <input type="checkbox"/> low. <input type="checkbox"/> very low.
8. Your knowledge about marine environment is: <input type="checkbox"/> very high. <input type="checkbox"/> high. <input type="checkbox"/> medium. <input type="checkbox"/> low. <input type="checkbox"/> very low.

Results and Discussion

When we asked what is environment, most children showed a romantic-naturalistic view (Figure 1), e.g. *“Is a beautiful place, with a lot of nature”*. Few of them included human beings, trash and city as part of environment (Figure 2).

When students are asked to choose the tree thing that they remember when think about marine environment (ME), the most cited answers were: living beings, nature preservation, beauty and curiosity (Figure 3). These results reinforce the data showed at Figures 1 and 2, suggesting that a romantic-naturalistic view of environment is applied also to ME.

The main reason to conserve ME is the living beings that are there (Figure 4). Among all these living beings, the ones that students most remembered about were: fish, shark, whale, seaweed, sea horse and dolphin (Figure 5). The presence of seaweed among these organisms is inspected, since some works have been point out the so called “Plant Blindness”: people tend to ignore plants and valorized animals (HERSHEY, 2002; WANDERSEE and SCHUSSLER, 2001). Your case study showed a different tendency, once some seaweed can be consider real plants (e.g. green algae) or very closed taxonomic groups (e.g. red algae).

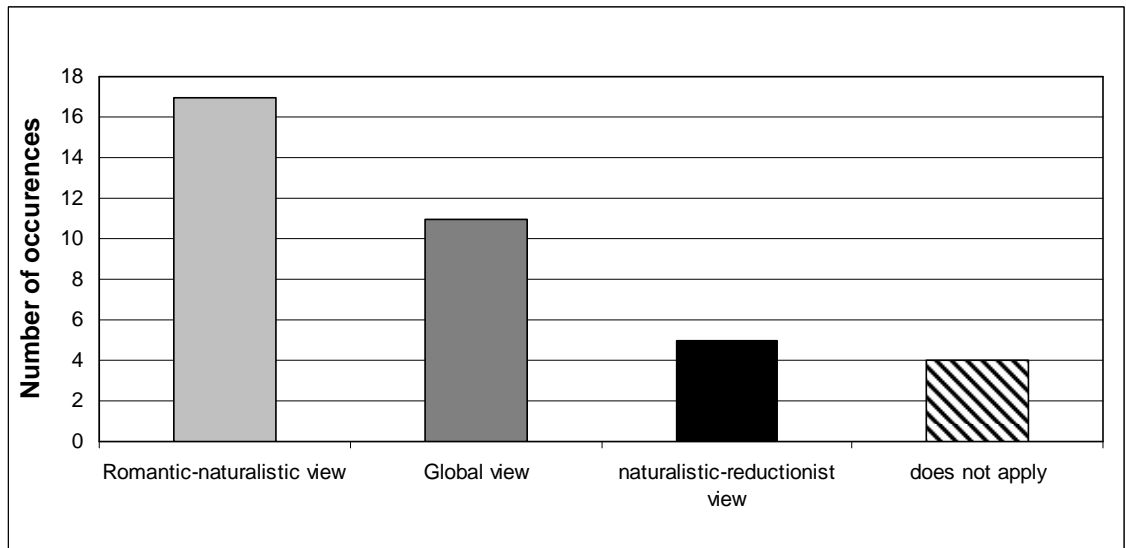


Figure 1. Answers for the question "What is the environment?".

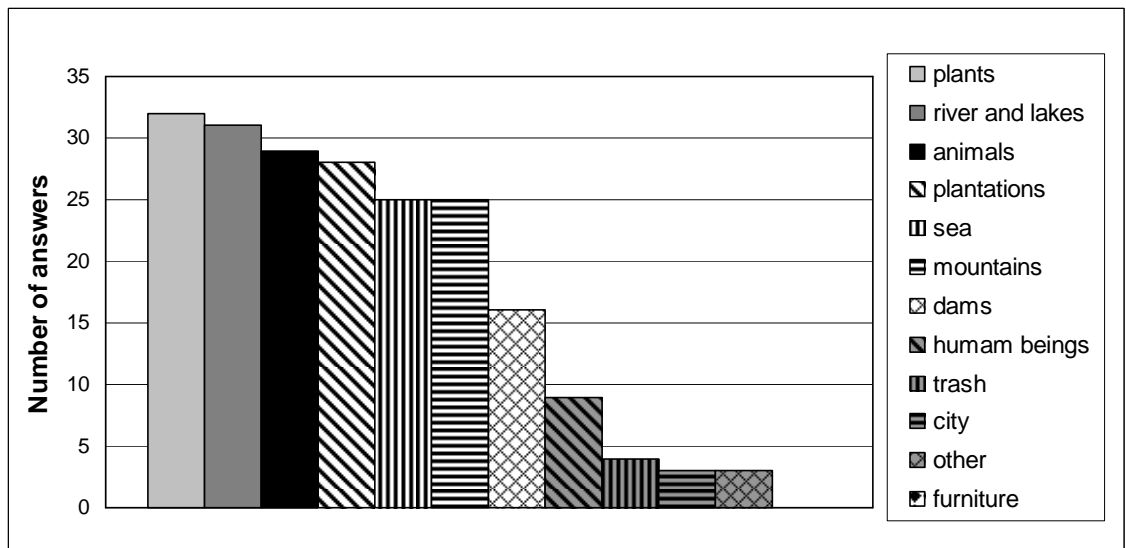


Figure 2. Answers for the question "Mark the elements that are part of the environment".

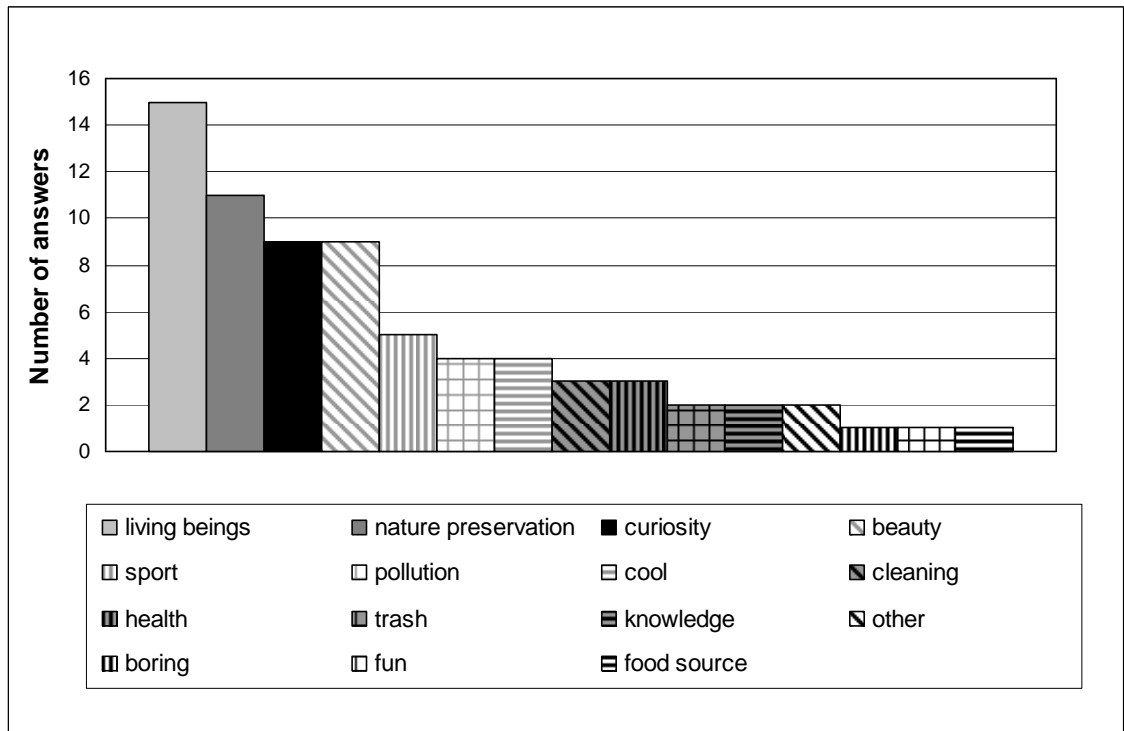


Figure 3. Answers for the question "When thinking about the marine environment, the first three words or phrases that come to mind are:".

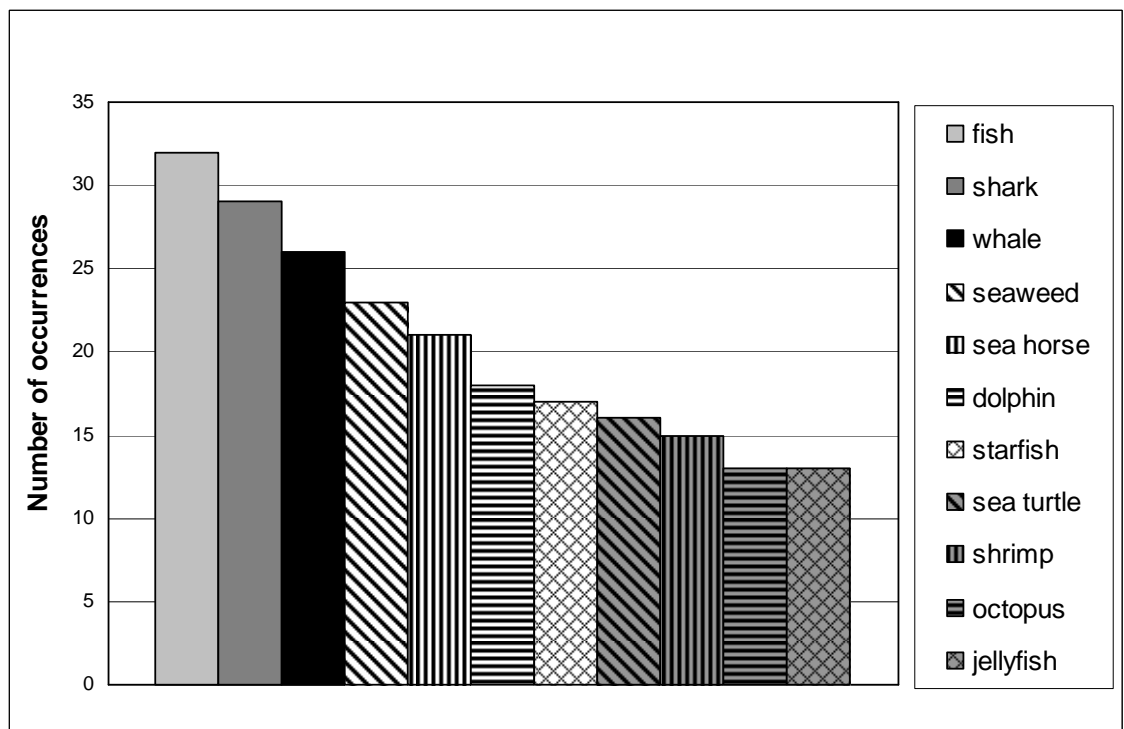


Figure 4. Answers for the question "Write ten marine organisms".

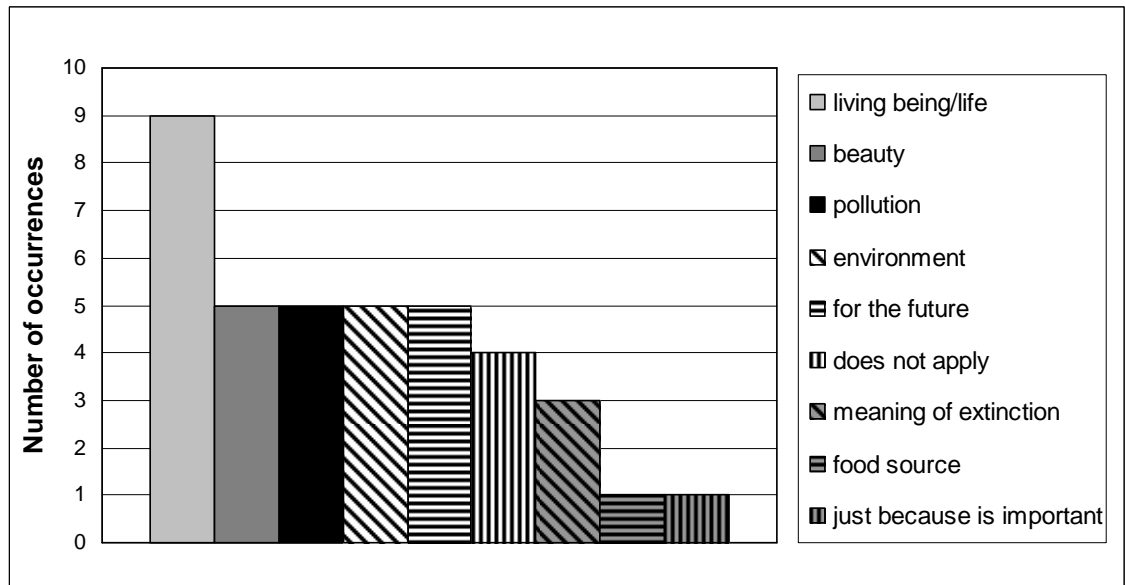


Figure 5. Explanations showed for positive answers for the question “Do you think that is important to preserve the marine environment?”

Most students declared high or very high interest about ME (21 students), but medium or low knowledge about it (26 students). The majority of students think that there are no relation between ME and their quotidian (25 students). To the others, the alimentation (3 students) and pollution (2 students) are the main relations. These results indicated that students assume a utilitarian view of ME when they think about their on quotidian. However, they have a romantic-naturalistic view when the think about ME in general.

We agree with the great number of educators and researches that indicated the environmental education programs as important tolls for improve biodiversity conservation (GAYFORD, 2010), including that one of marine environment (EVANS, 1997). The present research highlights the necessity of these programs focus on the development of a global view of environment, since most of the students showed limited spontaneous views (romantic-naturalistic and utilitarian). The global view can help students to recognize themselves as part of environment, as well as fell that they are responsible for it, chancing their behavior. Especially about ME, enforce to help students to correlate their quotidian and this environment is a great challenge, because established this relation seems to be even more difficult than in land ecosystems.

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References

BERCHEZ F.A.S., CARVALHAL F., ROBIM M. J. 2005. Underwater Interpretative Trail - guidance to improve education and decrease ecological damage. **International Journal of Environment and Sustainable Development** 4 (2): 128-139.

BEZERRA, T.M.O.; GONÇALVES, A.A.C. 2007. Concepções de meio ambiente e educação ambiental por professores da Escola Agratécnica Federal de Vitória de Santo Antão – PE. **Biotemas** 20(3): 115-125.

CHAN A., KIRCHER L., CUNDIFF A. J., GARDNER N., HROVAT Y., SCHOLZ A., KENDALL B. E., AIRAMÉ S. 2008. Striking a Balance between Biodiversity Conservation and Socioeconomic Viability in the Design of Marine Protected Areas. **Conservation Biology** 22 (3): 691–700.

EVANS K.L. 1997. Aquaria and marine environmental education. **Aquarium Sciences and Conservation** 1: 239-250.

FLORES, R.C; GONZÁLEZ-GAUDIANO, D. 2008. Representaciones sociales Del médio ambiente: um problema central para el processo educativo. **Trayectorias** 10 (26): 66-78.

GAYFORD C. 2010. Biodiversity Education: A teacher's perspective. **Environmental Education Research** 6(4): 347-361.

GRAY J.S. 1997. Marine biodiversity: patterns, threats and conservation needs. **Biodiversity and Conservation** 6: 153-175.

HERSHEY, D.R. 2002. Plant blindness: “we have met the enemy and he is us”. **Plant Science Bulletin** 48(3):78-85.

LUNDIN, C.G.; LINDÉN O. 1993. Coastal ecosystem: attempts to manage a threatened resource. **Ambio** 22: 468-473.

MALAFAIA, G.; RODRIGUES, A.S.F. 2009. Percepção ambiental de jovens e adultos de uma escola municipal de ensino fundamental. **Revista Brasileira de Biociências**. 7(3): 266-274.

SAUVÉ, L. 1996. Environmental education and sustainable development: a further appraisal. **Canadian Journal of Environmental Education** 1(1): 7-34.

STRAUSS A., CORBIN J. 1998. **Basics of Qualitative Research Techniques and Procedures for Developing Grounded Theory**. Sage Publications: London, 312pp.

WANDERSEE J.H., SCHUSSLER E.E. 2001. Towards a theory of plant blindness. **Plant Science Bulletin** 47(1): 2-9.

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