

Children's and teenagers' socio-environmental perceptions. Environmental Education proposals. La Huacana (Mexico).

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Abstract

The development of new approaches in Environmental Education and the use of innovative methodologies may improve knowledge about social interests and people's perceptions towards the environment. In the present study, drawings, questionnaires and participatory use of Global Positioning System (P-GPS) were employed to obtain children's and teenagers' socio-environmental perceptions about their community. The results can be used to formulate proposals related to educational and environmental decision making processes in a regional and local context.

The study area is located in the municipality of La Huacana, in Michoacán State (México). The sample is formed by 284 pupils from elementary and secondary schools, aged from 5 to 17, who are living in small rural villages around the Natural Protected Area of *Volcán el Jorullo*.

The result obtained from the statistical analysis show that place of residence (rural or urban) is the main factor that influences differences in children's and teenager's socio-environmental perceptions.

Keywords: socio-environmental perceptions, children, teenagers, pictorial representations, urban-rural differences in environmental attitudes, Mexico.

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1. INTRODUCTION

In the current global climate change context, environmental education appears to be an effective tool to promote environmentally-sensitive attitudes and values for different social levels, taking into account differences in educational processes in industrialised and non-industrialised countries. Environmental education is considered as a tool of social change in both contexts. However, in rich countries, environmental education has focussed on avoiding pollution, over-consumption and excessive waste whereas in poor countries it has concentrated on overcoming unfulfilled social needs like illiteracy, malnutrition and unemployment (González Gaudiano 1999).

This research contributes to new approaches that can reveal the interests of a social group through the interpretation of their socio-environmental perceptions about their local environment, expressed through drawings and questionnaire responses (Sobel 1998; Hume et al. 2005; Al-Zoabi 2001; Matthews 1995; McCall 2005). This can lead to formulating environmental policy and educational planning proposals at regional and local scales.

The present research on environmental education is the result of an agreement between the Institute of Geography (UNAM, México) and the Institute of Environmental Science and Technology (ICTA-UAB, Barcelona, Spain). Both institutions are interested in interdisciplinary studies and integrated socio-environmental analysis.

2. MAIN GOALS

The general goals of the present study are as follows:

- To define the basis of a methodology for identifying the socio-environmental perceptions of a specific social group (children and teenagers) towards their local environment, in accord with one of the basic Environmental Education principles defined in the Tbilisi Declaration (1977).
- To design a set of proposals related to the research results in order to strengthen educational and decision making processes in a regional and local context.
- To analyze the feasibility of incorporating the research results in the Management and Natural Resources Conservation Plans at the regional level (Management Plan

of the NPA Volcán El Jorullo) and at the local level (Community Development Plans).

3. METHODOLOGY

The methodology used in this research is related to the formulation of the main research question: *How can children's and teenagers' socio-environmental perceptions be included in educational and decision making processes in regional and local contexts?*

The methodology applied a form of grounded theory in terms of inductive research to elicit, interpret, and analyse children's and teenagers' perceived feelings about their environments (cf. Matthews 1995 in Kenya; Hume et al. 2005 in Australia; Clacherty 2006 in South Africa). The methodology was based on a mix of qualitative methods (interactive interpretation of expressive free drawings) and quantitative methods (statistical programme: SPSS analysis of questionnaires). Drawings were only used with elementary school students aged from 5 to 12, and questionnaires were used with secondary school students aged from 13 to 17. In addition, a participatory GPS exercise was used in order to test a useful methodology for children to acquire and communicate their own spatial information about their locality. Similar methodology has been applied in e.g. New Hampshire USA (Frost 2004), California (Appleyard 2002); and India (Kumar 2003; Mallick & Kaira 2005).

The children's and teenagers' socio-environmental perceptions were divided into *preferences* (positive perceptions) and *aversions* (negative perceptions) and organized in 17 thematic categories using a bottom-up clustering construction. This was based on individual interpretations of the drawings and investigative talks with the younger children, and on content analysis of the questionnaire responses for the teenagers.

The thematic categories eventually identified are:

Nature (e.g. birds, trees, flowers), Personal & Family items (e.g. home, toys), Poisonous animals (e.g. snakes, scorpions), Environmental quality (e.g. water quality, garbage), Climate (e.g. high temperatures), Politics (e.g. unsatisfactory local governance), Religion (e.g. church), Social (e.g. alcoholism, drug addicts, violence), Volcano (el Jorullo), Locality (e.g. everything related with the locality), Accidents (e.g. drowning), Conflicts between communities (e.g. over water rights), Lack of infrastructure (e.g. poor

road connections), Infrastructure (e.g. school, municipal square), Landmarks (e.g. springs & waterfalls), Security (e.g. to be saved in the locality) and Cultural items (e.g. traditional celebrations).

4. THE CASE STUDY: LA HUACANA

The study area is located in the municipality of La Huacana, in south-east Michoacán State (Mexico).

The localities correspond to eight small rural villages with populations between 100 and 1.000 inhabitants, the majority of them around the *Volcán El Jorullo*, and the municipality of La Huacana with 9000 people. The area is especially rich in natural and cultural diversity. The two main local economic activities are in the primary sector (livestock farming and maize cultivation), though other developments are being planned in the area as ecotourism programs.

In September 2005, the Michoacán Government declared Jorullo Volcano and its surrounding area as a Natural Protected Area (NPA) to preserve the local biodiversity and to promote sustainable management. Nowadays, nine *ejidos*¹ have their own lands inside the NPA perimeter: Las Carámicuas, El Naranja de Jorullo, Los Copales, El Salitrillo del Limón de Jorullo, Mata de Plátano, La Alberca, David C. Manjarrez, Puerta de la Playa and Agua Blanca.

It is important to emphasise that Michoacán State has one of the highest out-migration rates in Mexico, not only to cities in other states, but also out of the country, especially to the United States of America. The migration phenomenon determines and significantly influences the way of life of La Huacana people. The majority of adult women are engaged in domestic household activities and looking after of the family, whereas men and teenagers are forced to leave their homes looking for a job and better opportunities.

¹ The *ejido* is a form of communal ownership of rural land with a long history and thus a cultural imprint. Nowadays, as in La Huacana, families have private land parcels within the *ejido*, but there are also usually areas of communally-held land within the *ejido*. Rural Mexico has two other kinds of land ownership, private property and indigenous community lands.

5. INTERPRETATION OF SOCIO-ENVIRONMENTAL PERCEPTIONS

The sample is formed by 284 pupils from elementary and secondary school (135 boys and 149 girls), aged from 5 to 17. Most of them live in small rural villages around the NPA *Volcán el Jorullo* (71,8%) but urban participants (28,2%) were also included in order to research differences in perception according to the geographical context.

In our statistical analysis, children's and teenager's socio-environmental perceptions (as preferences or aversions) were considered as the dependent variable, while the factors which define the main characteristics of the sample (age, gender, school year, *ejidatario* (resident of a *ejido*), and urban or rural place of residence) were considered as the independent variables.

The results obtained from the statistical analysis show that place of residence (rural or urban) is the main factor that influences differences in children's and teenager's socio-environmental perceptions.

The other independent variables, (age, gender, *ejidatario*), did not show any significant effect on the perceptions, which was surprising. An expectation had been to find perceptual and value distinctions between boys and girls, and between age groups, as well as differences based on cultural links to a *ejido*. Although there were some instances of small girls drawing flowers and boys representing football pitches as 'positives', this clichéd gender distinction was not statistically supported (c.f. Matthews 1987; Al-Zoabi 2001).

In rural locations, the principal preference is for *Nature* a deep association with *biophilia*. The main aversions are to *Poisonous animals* (snakes and scorpions) and to *Environmental quality*, which in the rural context refers to the poor quality of river water, and in the urban context to water quality and solid waste disposal.

In the urban location the principal preference is for La Huacana's plaza (central square), and the main aversion is related to different kinds of social conflicts (alcoholism, drug addicts, violence). Boys' negative perceptions are primarily to do with social conflicts, whereas girls are more often concerned with lack of infrastructure (which includes

communications problems). It is interesting to speculate on underlying reasons for this, such as boys being more exposed to conflict and violence in public spaces.

6. IMPLEMENTATION PROPOSALS

The final results have been used to formulate implementation proposals related to educational and decision making processes in a regional and local context. The contribution of the present work is to propose and construct concrete environmental education actions which take into account children's and teenagers' needs, as reflected by their socio-environmental perceptions of their localities, and incorporate them into local government policies and educational curricula.

With reference to *environmental education proposals*, the identification of socio-environmental perceptions can contribute to the development of collective school projects to deal with socio-environmental problems that affect the way of life of local people (Astudillo 2003; Barraza & Walford 2002). One of the main problems in the current Mexican educational system is the increasing distance between the real world and the curriculum.

The environmental education proposals constructed from the present research are divided in two: proposals related to the links between the school and its locality, and proposals for incorporating the socio-environmental dimension into the school curriculum.

6.1. Links between school and locality

Some proposals that promote the link between school and its locality include:

- To make these research results known to different social groups: local government, teachers, children, teenagers, local people, etc.
- The present research results could be useful to design collective actions between the school and its locality, which is a major interest of the president of La Huacana municipality.
- To promote new transformation processes in the social system in order to overcome the increasing social and communal lack of responsibility, one of the main problems identified by the teenagers.

- To connect educational and social processes (school and life, curriculum and the real world...) in order to create specific projects adapted to resources, needs and individual realities.
- To help teachers to identify problematic situations related with children and teenagers' natural and social context.

6.2. Incorporating the socio-environmental dimension in the curriculum

There are two main proposals to incorporate the socio-environmental dimension in the curriculum.

- To properly value children's and teenagers' knowledge in order to adapt the education system to the real situations, according to one of the basic principles of environmental education: to deal with children's and teenagers' problems in an integrated and holistic way.
- To make the research results known to primary and secondary school teachers in order to generate reflections on environmental and ecological and social theories and to design environmental education programs focussed on solving the main socio-environmental problems as identified by the children.

7. BIBLIOGRAPHY

Al-Zoabi, A.Y. (2001?). *Children's 'Mental Maps' and Neighbourhood Design of Abu-Nuseir, Jordan*. Riyadh: King Saud University, College of Architecture & Planning.

Astudillo, C. et al. (2003). *Comunidad de aprendizaje: un proyecto colectivo para el abordaje de problemáticas socioambientales en la escuela*. *Tópicos de Educación Ambiental*. México (13): 8-20.

Barraza, L. and Rex A., W. (2002). *Environmental education: a comparison between English and Mexican school children*. *Environmental Education Research* 8 (2): 171-186.

Clacherty, G. (2006). *The world in a suitcase: psychosocial support using artwork with refugee children in South Africa*. *Participatory Learning and Action* 54: 121-127.

Frost, B. (2004). *Community mapping in New Hampshire: Who says 10-year-olds can't learn GIS?* Orton Family Foundation Web magazine, 31 May, 2004.

González Gaudiano, E. (1999). Otra lectura a la historia de la educación ambiental en América Latina y el Caribe. *Tópicos de Educación Ambiental*. México (1):9-26.

Hume C.; Salmon J. and Ball K. (2005). *Children's perceptions of their home and neighborhood environments, and their association with objectively measured physical activity: a qualitative and quantitative study*. *Health Education Research* 20 (1): 1-13.

Kumar, R. S. (2003). *Technology at local level – mapping the neighbourhood with school children*. Paper given at OS Ordnance Survey, Cambridge Conference, Proc. Paper 5D.5.

Matthews, H. (1995). *Culture, environmental experience and environmental awareness: making sense of young Kenyan children's views of place*. *Geographical Journal* 161 (3): 285-295.

Mallick, R. and Himanshu, K. (2005). *Mapping the Neighbourhood. Innovation in schools*. *i4d Information for Development*. 3 (11): 7-8.

McCall, M. (2005). *Mapping lost homes*. *GIS@ Development (Asian GIS Monthly)* 9(6): 24-27.

Sobel, D. (1998). *Mapmaking with Children*. London: Heinemann.