
Students' perceptions of school contributions for changes in attitudes for the protection of forest environments

Fernando Manuel Raposo Morgado*

Departamento de Biologia,
Universidade de Aveiro,
3800 193 Aveiro, Portugal
E-mail: fmorgado@bio.ua.pt
*Corresponding author

Nélia Maria Dias Teixeira Leal

School E.S. José Belchior Viegas,
S. Brás de Alportel, Portugal
E-mail: nelia.leal@iol.pt

Ana Raquel Fernandes Pires Lopes

School E.B. 2, 3 Egas Moniz,
3860, Avanca, Portugal
E-mail: requel_2000@yahoo.com

Abstract: The forest environment is threatened in many ways by the exploration of its natural resources, leading to a crisis situation. To improve the suitability of education programs, it is necessary to assess students' conceptions, attitudes and understanding of this situation. By using a variety of questions aimed at children aged 12–14 years, this work explores students' perceptions of the role of schools in providing education about the protection of the forest environment. The students' experiences offer clear educative and social contrasts about students' ideas. The results showed that the children are aware of the consequences of global environmental problems, but also stressed the need to assist students in their perception of the role of the school in effecting a change in attitudes about forest protection.

Keywords: environmental education; Portugal; forest environments; students' perceptions.

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Biographical notes: Fernando Manuel Raposo Morgado is Professor Auxiliar in the Department of Biology at the University of Aveiro. He specialises in the areas of marine biology and ecology and planctonic biology and ecology. His principal research interests relate to aquatic ecotoxicology, planctonic ecology and environmental education.

Nélia Maria Dias Teixeira Leal holds degrees in food engineering, biology and geology and safety and health at work. She is a teacher specialising in environmental education. She also conducts research on health and safety at work issues.

Ana Raquel Fernandes Pires Lopes was trained in the fields of biology and geology and is a teacher specialising in environmental education.

1 Introduction

In recent years, forests have been subject to various studies aimed at identifying measures that may lead to their recovery (Likens, 1995; Gilg, 1991; Young, 2000; Ennis et al., 1993; Harper, 1993). The risk of collapse of the forestry sector has thereby been averted and the vocation of Portuguese forests has been confirmed by establishing an appropriate size and diversity level for this sector adapted to the natural conditions found in Portugal. The management and commercial exploitation of Portuguese forests should be based on models able to satisfy the ecological, economic and social functions associated to forests (DGSFA, 1995; CECE, 1989; Carvalho, 1992; Bolsius et al., 1993).

A set of long-term strategic objectives should be established whereby the development of all levels of forests may be guaranteed, and another series of short-term and medium-term objectives, enabling an equilibrium to be re-established between timber supply and demand (Baptista, 2001; Demangeot, 2000; Jordan, 1998; Cloke, 1989). Key specific measures aimed at safeguarding and improving the forestry sector include: reduction in areas affected by forest fires (fire prevention and fire-fighting); re-organisation of production structures; improvement of silvicultural practices; reforestation; maintenance, conservation and fostering of biological diversity in forest eco-systems; creation of information circulation mechanisms and training of technical specialists (Price, 1996; Jordan, 1998; Bolsius et al., 1993; Harper, 1993; Gilg, 1991).

These environmental problems will require precise solutions including changes in individual life-style, educative projects, economic and political definitions and international cooperation (Pike, 1999; Garcia, 1999; Craft, 1996). Due to the importance of these problems to human quality of life, the education and formation in schools about such issues will assume an increasing importance. To increase the fitness of scholarship programmes, the knowledge of student's appreciations, conceptions and attitudes are needed. This work provides semi-structured inquires with children aged 12–13 and explores the perception of students about the role of school in the education for the protection of forest environment. The student experiences offer clear educative and social contrasts about student ideas and the results showed that the children are aware of the consequences of global environmental problems but stressed the need to assist students in their perception about the role of the school in effecting a change in attitudes about forest protection.

2 Methodology

This study was based on written questionnaires including open-ended, closed response and multiple choice questions, carried out in the 2000–2001 academic year, involving 100 pupils studying Natural Sciences disciplines in the seventh and eighth years (12–14 year old) of the Secondary School (third Cycle) of Sever do Vouga, Portugal. The age variable served to limit the target population selected for the questionnaires – pupils in the seventh and eighth years. After analysis of pupils' ages, we were able to determine whether each pupil's schooling took place at a normal rhythm or whether certain pupils had suffered delays in their scholastic progression. On a normal basis, pupils will enter the first year (in the first cycle of basic education) at age 6 and will start the seventh and eighth years at age 12 and 13, respectively.

The use of a written questionnaire made it possible to examine a large-scale sample with reasonable ease, while guaranteeing anonymity. This is an important pre-requisite to ensure that the respondents provide authentic responses to the questions posed. This method also made it possible to choose the time at which the questionnaire was administered, in order to cause the least possible disturbance to lessons.

The questionnaire was principally composed of closed response questions. This was for two main reasons:

- it was possible to learn about the respondents' opinions before the alternatives presented
- it was possible to collect a considerable amount of data with relative ease.

On the other hand, open-ended questions allowed respondents to make suggestions and express personal opinions, thus minimising certain limitations associated with the options available in the closed response questions.

The construction of this survey was based on three main topics: social, educational and cultural contexts. The principal objective of this approach was to collect information at three distinct levels and with different objectives.

As stated by Pardal and Correia (1995), a well-presented questionnaire is more likely to be well received by respondents. All the questionnaires bore the study's title, and had an introductory note that identified the researchers, explained the study's objective, requested the pupils' collaboration, guaranteed anonymity and affirmed that responses would not affect the evaluation. Finally, we expressed our thanks for the collaboration provided and indicated the date (month and year). We also ensured that the questionnaires were reasonably short, and gave pupils the chance to fill them in at their ease during an appropriate period of time.

3 Construction of the questions

Different types of questions were used in the questionnaires, each with specific interest in terms of the information required. The survey questions were divided into three parts, relative to the social context, educational/training context and forestry context. Straightforward language was used whenever possible to minimise misunderstandings. On the basis of the classification presented by Correia and Pardal (1995), four types of questions were presented:

- *questions of fact*: concerning concrete matters such as school, sex and age
- *questions of action*: concerning an action undertaken, such as extra-curricular activities or the discussion of Biology topics within or outside the school
- *questions of opinion*: which confronted respondents with a situation where they must state an opinion
- *questions of intervention*: where pupils reveal their attitude regarding a future event, such as the profession they would like to pursue or the type of activities they would like to conduct in Natural Sciences lessons.

The latter group of questions was more difficult for pupils, since they obliged them to anticipate future situations. The questions were posed in the form of open-ended, closed response and multiple choice questions:

- open-ended questions confer freedom of response to the pupil surveyed
- closed response questions oblige the respondent to choose between one of the responses presented
- multiple choice questions, in a closed list, give no freedom to the respondent to express his or her opinion beyond the alternatives presented
- multiple choice questions, in an open list, give the respondent the option to choose between the alternatives provided or add another response.

4 Description of the target population

The district of Aveiro stretches from the Douro River to Buçaco and from the coast to inland areas, occupying a total area of 2911 Km². The resident population is around 6,56,007 inhabitants (according to the 1991 census), distributed across 19 Municipalities, 208 Parishes and ten Cities. The working population is composed of 3,25,000 persons, and represents 7% of the total national working population. The district has the third highest level of economic growth in Portugal (with 12% of Portuguese industrial production), and its main sectors are footwear, timber, cork, fishing and agro-food industries.

5 Results

<i>Question: In your opinion is the forest environment in danger?</i>	%
Yes	93.75
No	4.17
<i>Question: Who is the principal responsible for that situation?</i>	
Human activities	95.83
Natural causes	4.17
<i>Question: If the situation remains the same, what will happen to the forest environment?</i>	
Increase	10.42

Decrease	89.58
Maintains	0.00
<i>Question: Do you think that it is still possible to assure forest restoration?</i>	
Yes	97.92
No	2.08
<i>Question: Whose responsibility is it to take measures?</i>	
Forest and agriculture institutions	58.33
Government	41.67
Environmental associations	64.58
Schools	43.75
Town hall mayor's official residence	37.50
General population	85.42
Nobody	0.00
<i>Question: What kind of measures do you think it is urgent to take?</i>	
Implanted trees	50.00
Restore wood balance	20.83
Acting in the prevention of fire combat	62.50
Increase biodiversity conservation	35.42
Reorganise land management	18.75
Environmental education to the population	60.42
Graduate techniques specialisation	35.42
<i>Question: Does the school contribute to your formation about these subjects?</i>	
Yes	83.33
No	16.67
<i>Question: If you answer no, what are the main reasons for that?</i>	
Too large curricula	4.17
Less practical lessons	10.42
Generic approach of the themes	8.33
Teachers' disinterest	0.00
Other	4.17
<i>Question: How can school improve your formation about forest environment?</i>	
	%
Changing school curricula	25.00
Promoting environmental debates in the school	60.42
Promoting field studies and study visits	75.00
More dynamic teachers	31.25
Other	6.25
<i>Question: In the science classes are there debates about forest environment?</i>	
Yes	95.83
No	4.17

Question: What kind of measures do you suggest to improve the forest environment restoration and conservation?

Increase forest vigilance	4.17
Prevent fires	27.08
Increase environment education to populations	4.17
Increase forest conservation	20.83
Decrease pollution	52.08
Plant trees	16.67
Decrease cutting trees	27.08
Clean the forest	4.17
Restrict forest occupation	2.08
Increase natural products consumption	2.08
Increase recycling of materials	8.33

6 Discussion

The National curriculum for secondary school clearly defines objectives associated with the individual dimension of the students' formation, the domain of knowledge and skills and the preparation for the development of capacities in the professional fields and the domain of citizens (DES, 1992, 1996; DGEBS, 1992a, 1992b). The basic programmatic guidelines defined are fundamentally in a curricular structure divided into three main components:

- *initial formation*, requires obligated frequency
- *specific formation*, variable with the options of students
- *technical formation*, directed to the practical fields of activities.

To complete training, the initial component may include a formative complement through a multidisciplinary group of disciplines and activities, relevant to *the student knowledge and the harmonisation between scholarship experience and the society*.

The main goal of the national curriculum programmatic guidelines to the schools clearly intends to develop a formation projected to the outside world. School and society are related, and this stresses the importance of the creation of new dynamics of teaching that lay beyond the usual transmission of knowledge. The students must retain a broad knowledge base and the domain of their basic capacities and achieve more ambitious objectives related to the sense of critical analysis, creativity, artistic and cultural sensibility, civic responsibility and so, and increase awareness to the problems of the real world and their contribution to the resolution of the community problems.

The enquiries' results reveal that students are aware of the forest problems in general. There was general and unanimous consensus amongst all pupils that forests currently are in peril, principally as a result of man's actions. Unless due measures are taken, pupils are convinced that current forest areas will tend to diminish in size. At the same time, pupils remain hopeful and believe that it is possible to recover/conservate the forest heritage.

According to most pupils, responsibility for action lies with the public in general and in particular with Environmental Associations and Forestry/Agricultural Institutions. The principal measures that pupils considered to be important were fire prevention and fire-fighting initiatives, reforestation and recovery of equilibrium between timber demand and supply. Many pupils also identified the need for raising the awareness and understanding of the general public. Certain pupils also supported measures such as conservation and promotion of biological diversity, reorganisation of landholdings and training of technical specialists.

Overall, almost all the pupils believed that their school contributes towards their training in the field of Environmental Education. Those respondents, who believed that their school does not contribute to their Environmental Education, considered that this was due to lack of practical lessons, a superficial approach to the subject and a general lack of interest amongst teachers. According to many of the pupils, their school could improve its Environmental Education by organising field trips, study visits and debates on environmental issues. All pupils agreed that environmental questions are addressed in Natural Sciences disciplines.

As citizens of the future, each pupil suggested certain strategies to improve and conserve forests. Two main strategies specified by the pupils were fire prevention and reforestation. Many pupils stated that forests should be protected from pollution, and conserved with the aid of surveillance techniques and fencing. According to some pupils, one way of ensuring that factories and the general public did not cause much pollution in forests would be to ensure that they use more environmentally friendly materials. Other pupils also suggested that another means of reducing the felling of trees would be to use recycled paper and avoid 'exaggerated use' of timber. Certain more radical pupils suggested that wood-substitutes should be 'invented' in order to avoid excessive use of timber and substituting it by other products that do not cause direct harm to forests.

The results provide evidence for the importance of the transformation of the relation between school and the society, in order to increase its social value. Professional biologists have an increasing responsibility to advise students and the public about the problems of the biosphere and to stimulate the application of knowledge to the resolution of real problems, to help formulate suitable solutions, which requires competence in communication, formative and informative contents, but also practical and experimental training programmes (Pike, 1999; Garcia, 1999; Craft, 1996; Fazenda, 1999; Cachapuz, 1993; Pereira, 1994).

The increase in technological societies on a global basis, competing for world markets, results in an increasing need for industries and business to be scientifically literate. This stresses the importance of a reorientation and reshaping of human activities to consider biological principles. Biology holds the key to understand and to mastering these problems and biologists will be needed to solve them. The recruitment of future biologists capable of making an effective contribution will rely on many components and training and these must be considered individually and in combination, to ensure biological literacy in its broadest sense (ECBA, 1993; Trindade, 1999). In the context of the educative system of the recent years, teachers of different scientific disciplines must consider in its formation education, teaching and technological development, and topics relevant to professional performance should be included, such as policy and decision making, public administration, problem solving case studies, programming, operational research, law, economy and management (ECBA, 1993).

This will foster active involvement of the public, make the educational system more relevant and realistic and establish greater inter-dependence between these systems and the surrounding natural and social environment, thus fostering local well being (Bachelet, 1997; Broghad, 1997; Beltrão and Nascimento, 2000; Teixeira, 1999; Evangelista, 1999; Figueiredo, 1993; Máximo-Esteves, 1998; Unesco, 1980). In this context, schools have constituted a fundamental aspect of this model, and should continue to do so, in order to create global environmental awareness. Such awareness should involve natural, cultural and human sciences to contemplate the various dimensions of the environment (natural, historic-cultural, socio-economic and political) (COB, 1991). Although the biological and physical-chemical aspects constitute the basis of the human environment, special attention will be paid to conceptual models and instruments of other disciplines, in order to achieve an understanding of the complex nature of the environment as the result of interaction between biological, physical, social and economic aspects (Unesco, 1980; Evangelista, 1999; Figueiredo, 1993; Matthey et al., 1984).

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