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AN ASSESSMENT OF THE ENVIRONMENTAL EDUCATION IN GREECE

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ABSTRACT

This study briefly reviews the Environmental Education (EE) in Greece, examines the teachers' training and participation in E.E. programs as well as the realization and allocation of these programs in secondary education. It also analyzes facilities availability in schools and the factors, which encourage or discourage teachers to work out E.E. programs and their proposals for E.E. promotion The sample secondary schools was selected representatively out of the thirteen educational regions. The tool of our research was a questionnaire, which was addressed to 911 schools of which 815 responded. The results of this study lead to the production of new teaching material in order to upgrade educational programs and enhance the involvement of both teachers in training courses and the participation of students in relevant activities.

KEYWORDS: Environmental Education, in-service teacher training, Realization of E.E Programs, Secondary Schools

INTRODUCTION

In the very recent decades, increasing concern on the natural environment has been accompanied by developing "Environmental Education" (EE) through clarification of its aims and purposes (Sterling, 1985). In this sense, as the years went on, education in general, has extended beyond its traditional boundaries by addressing topics that are political, scientific and/or social (Sainsbury, 2003); for instance, greenhouse effect and global warming–that is, human influences on levels of greenhouse gases and stratospheric ozone as well as their impact on human health and society (Morgan and Moran, 1995). Therefore, schools and educators, in cooperation with families, may play a key role in the children's sensitiveness and familiarity with the natural world.

Although the nature and goal of E.E. curricula are subjects of scientific debate, there appears to be consensus on several points. Most experts agree that E.E. encompasses: i) understanding of key concepts and principles of environmental literacy, ii) familiarity with the natural world, and iii) ability to apply scientific knowledge and ways of thinking to daily life and social problems. In a recent national conference in Greece it was suggested that schools curricula should be designed to develop three types of environmental literacy: functional, cultural and critical (Papadimitriou, 2000). Functional environmental literacy is basically book knowledge related to environmental and scientific concepts; cultural environmental literacy explores the reasons that society values the environment; and critical literacy encourages students to use functional and cultural environmental literacy to determine appropriate future action as responsible citizens.

The question arises as to which concepts students and interested citizens should understand to be thought as functionally and environmentally important. Cherett (1989) identified some important concepts such as ecosystem preservation, energy flow, materials recycling, food webs and species diversity. Other educational researchers reported many misconceptions about natural environment and weather phenomena that students carry into their science classes (Orr, 1992; Munson, 1994; Spiropoulou et al., 1997; Andersson and Wallin, 2000) and suggested that these misconceptions need to be taken into account in curriculum designs (Driver 1989; Hlebowitsh 1991; Nelson et al. 1992; Spiropoulou et al 1999), which are important in E.E. Orr (1992) was concerned about the inaccuracies in teaching about the environment and the effect that these inaccuracies have on environmental literacy. He established the connection between literacy and behavior, when he pointed to the impact that environmentally illiterate adults have on the world; even if adults want to improve the environment, they do not know the way, due to the lack of fundamental knowledge of the key principles concerning the environment. It is expected that similar remarks apply to students too. Furthermore, most teachers are not environmentally aware to a great extent, they fail to incorporate E.E. into the curriculum as they have not been exposed to integration strategies themselves, and as a result they do not foster literacy in E.E.

Moreover, E.E. provides the school with a positive approach to society, because it helps the entire process of education in the following ways:
-*For students*, it (a) sensitizes them to crucial environmental issues, (b) improves their decision-making and problem solving skills, and (c) enables them to act in a positive way to protect the environment.
-*For teachers*, it enables them to (a) adopt and apply alternative teaching methods (b) become aware of students' abilities and (c) integrate E.E. in the school curriculum.

The E.E. contributes significantly to a more student-centered curriculum development, encourages students to ask-think-act in a scientific way, motivates project-based learning through all subjects and focuses on environmental and health education. During the last decade, Greek state educational policy provided sufficient illustrations of the problem, while recently there is evidence of research into teaching, learning and assessment in E.E. literacy.

The Greek Educational system

In Greece, there is a twelve-year education system, divided into two parts: Primary School (grades 1-6) and Secondary School (grades 1-6). Until the early 1980s, E.E. had an informal place in Greek schools, while education has mostly attained by teaching separate subjects. Class schedules included Greek language, history, science, mathematics, etc, whereas the results were fragmented; for instance, learning meant memorizing without a connection to daily life.

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Since the early 1990s, environmental education has flourished in many Greek schools, due to its establishment in the national educational system, in accordance with the law 1892 (ACTION 111/1990). The aim of this law is to increase awareness, change attitudes and behaviors, elucidate values, create commitments, develop skills and encourage actions to natural, social, technological and historical environment. Under this law, E.E. is the process leading to responsible individuals and group actions in both biophysical and socio-cultural environment. This law also enhances critical thinking, effective decision – making skills and applies the appropriate scientific method in solving problems. Under the same law the Greek Ministry of education established Environmental Education Centers all over the country and positioned teachers in charge of E.E in every prefecture. Moreover the E E. is applied to schools under special programs, which take place inside or outside the daily schedule.

The first step towards the implementation of E.E. in Greece has been taken through in-service training seminars, which focus on many environmental topics and problems and aim at raising environmental literacy to teachers who attend these seminars on a volunteer basis.

The Research

Many issues were investigated throughout the implementation of the research. The main focus of the research was to find answers to the following issues:

1. The number of teachers who were trained during 1991-2000.
2. The number of E.E. programs which were realized in schools.
3. The allocation of programs in different areas of Greece such as, central, insular and mainland territories.
4. The reasons that encourage or discourage teachers to work out special E.E. programs with their students.
5. The material and technical facilities available in schools.

Under the scope of the current paper, the tool of our research was a questionnaire, which consisted of multiple choice and open-ended questions. The questionnaire was addressed to 911 schools of which 815 responded. This questionnaire has completed by Headmasters and teachers of secondary schools. For the first, second, third and fifth issue, multiple choice questions were designed while for the fourth one the questions were open-ended. Since the number of questionnaires was large, a preliminary coding classification based on the content of respondents' answers was attempted using a part of the questionnaires. A final coding frame was developed as in many cases the respondents' answers reflected more views of Headmasters and teachers of secondary schools, which will be further presented in this paper. Even though we were interested in exploring views from Headmasters and teachers in secondary schools all over Greece, in this research we selected thirteen representative prefectures, one from each region of the country as stated in the third issue.

RESULTS

Tabulation and statistical analysis of the survey results lead to the following remarks:

Number of schools teachers trained during 1991-2000.

Table 1 indicates that from a total of 22,584 in-service secondary school teachers, 2,701 (percentage 12%) were trained. The number of trained teachers varies in each prefecture. The percentage of trained teachers in all the prefectures, mainly in Ioannina (4.7%), the 3rd Prefecture in Athens (4.6%), Heraklion (3.9%), Arcadia (3.2%) and Eurytania (2.5%) prefectures, is relatively low. On the other hand, the percentage of trained teachers in Kavalla (24.2%) and Achaia (40.8%) is remarkably high. This is attributed to the existence of two Environmental Education Centers in the same areas. A step-by-step analysis of the data provides further insights. From 2,701(100%) trained teachers, 34% had masters in Greek literature, 28.5% in Sciences, 11.6% in Mathematics, 10% in foreign languages, 9% in Technology and 6.7% specializing in other disciplines.

Table 1: Teachers and in-service training programs.

	District/Department	Total Number of Teachers /Trained Teachers	Percentage (%)
1	Attica/3rd Department in Athens[1]	4642/212	4.6
2	East Macedonia /Kavalla	1022/247	24.2
3	Central Mecedonia/2nd Department in Thessalonica[2]	4021/352	8.7
4	West Mecedonia/Kozane	1637/182	11.1
5	Epirus/Ioannina	1390/66	4.7
6	Thessaly/Trikkala	1272/150	11.2
7	Sterea Hellada/Eurytania	238/6	2.5
8	West Greece/Achaia	2542/1037	40.8
9	Peloponnesos/Arcadia	746/24	3.2
10	Ionian Islands/Corfu	866/100	11.5
11	North Aegean Islands/Lesvos	874/132	15.1
12	South Aegean Islands/Cyclades	1112/105	9.4
13	Crete/Heraklion	2243/88	3.9
	Total	22584/2701	12.0

[1] Includes seven departments.

Includes two departments.

In view of trainers involved in E.E. programs, Table 2 implies that the 2,701 teachers were trained by:
-Universities (443 individuals, 35 hours – training course)
-Regional Training Centers (483 individuals, 40 hours–training course).

Table 2: Teachers' Trainers.

Trainer	Number of Teachers	Percentage (%)
Universities	443	16.4
Regional Training Centers	483	17.9
In charge of E.E. per district	1325	49.1
Non-governmental organizations	450	16.6

-Teachers in charge of E.E. in 13 prefectures (1,325 individuals, 15 to 40 hours - training course).
-Non–governmental organizations (450 individuals, training course of shorter duration). This class includes teachers who acquired a postgraduate degree.
The majority of these courses included scientific, pedagogical and methodological issues. As a result there were many trainers in those courses. The teaching staff of the Universities participated actively in the training courses, only in the case that the training center was near the university campus.

Furthermore, a significant number of already trained teachers and teachers in charge of E.E. programs taught those issues in these courses. Under favorable circumstances their presence resulted in the link between theory and practice. In few training courses, the number of submitted applications was greater than the number of applications, which could be dealt with. This fact leads to a dual interpretation, they have not cleared either their training needs or they need other training features like content, duration and location (Pantidis, 1998).

The number of E.E. programs which were realized in schools and the allocation of programs in different areas of Greece such as central, insular and mainland territories.

Regarding the number of programs realized in schools of the selected administrative areas during 1995-2000, Table 3 illustrates that not all schools participated in the study; for example, out of 133 schools of the Third Office for Education Standards in Athens (central area), only 90 of them responded. From these 90 schools, 25 answered that they did not participate in E.E. programs at all, 48 participated in 1-3 programs and 17 of these schools participated in more than three E.E. programs. On the other hand, the schools of the insular region of the North Aegean islands, which have a long tradition in systematic realization of environmental programs along with the yearly presentation of their results to the local society, were an exception to the above. All 65 schools responded, 11 of them did not participate in E.E. programs at all, 3 participated in 1-3 programs and 51 of these schools participated in more than three E.E. programs. As far as the systematic realization of E.E. programs is concerned, schools in the Greek mainland areas, i.e., Kozane, Ioannina, Eurytania and Arcadia, had a relatively low participation (see Table 3). This is rather due to objective reasons such as weather conditions and long distances met by individual teachers and students. One reason is that trained teachers were transferred to other areas of the country resulting in their replacement by newly – appointed ones most of whom were not trained in these programs. The other reason accounting for the small number of E.E programs realized by schools was attributed to the fact that it was an after-school activity, so that students coming from remote areas were unable to participate.

The schools, which did not respond and did not participate in E.E programs at all, are mainly Senior High Schools. This lack of interest of the high school students is attributed to the fact that they devote most of their time studying for the entrance exams in University and/or Technological Education Institutes (TEI).

Table 3: The materialization of environmental programs in schools.

District/Department	Number of Schools	Schools without an E.E. program	Number of Schools with 1-3 programs	Number of Schools with >3 programs
Attica/3rd Dept. in Athens	133/90	25	48	17
East Macedonia/Kavalla,	47/46	3	20	23
Central Mecedonia/2nd Dept. in Thessalonica	141/135	27	87	21
West Mecedonia/ Kozane	61/58	14	42	2
Epirus/Ioannina	67/51	25	21	5
Thessaly/Trikkala	49	4	30	15
Sterea Hellada / Eurytania	10	3	7	0
West Greece/Achaia	116	11	65	40
Peloponnesos/ Arcadia	40/30	9	18	3
Ionian Islands/Corfu	37	13	7	16
N. Aegean Islands/ Lesvos	65	11	3	51
S. Aegean Islands/ Cyclades	55/53	14	34	5
Crete/Heraklion	90/75	26	31	18

Reasons encouraging or discouraging teachers to work out E.E. programs with their students.

The factors encouraging teachers to take up an E.E. program are:

-The environmental pollution and protection (50 %)
-The interdisciplinary character of E.E. (15 %)
-Students' interest and stimulation about the environment (14%)
-The teachers' training in E.E. and the authorities' support (11%)
-A full – time schedule (7.5 %); and
-Financial reasons (2.5 %)

On the other hand, the factors discouraging teachers to participate in E.E. are:

-The fact that these programs are based on after-school activities (38 %);
-The lack of adequate training (18 %);
-E.E. lacks individual organization and is not appreciated by education executives (18 %);
-The lack of motivation for teachers (14 %); and
-The work-load as well as schools offering their courses on a morning and afternoon basis, e.g., double shifts (12 %).

Teachers' proposals for the promotion of E. E in schools are:

- Teachers' training programs
- Teaching aids such as adequate educational material;
- Evaluation of the tasks, which are part of the program and award of extra marks to students as a bonus;
- Incorporation of E.E. into schools' timetable as an interdisciplinary subject and encouragement of volunteer participation in further after- school activities;
- Collaboration with experts on the studied issue; and
- Visits to places inextricably interwoven with E.E.;

Schools' technical facilities-materials

As far as the material and technical school facilities are concerned, it must be underlined here that schools are equipped with instruments which can be used as teaching aids on the whole, such as OHP, TV, video, tape–recorder, etc. Nevertheless, there is a noticeable lack of multipurpose classrooms suitable for innovative programs.

DISCUSSION

As presented above, the study attempted to explore the teachers' training and participation in environmental programs as well as the realization and allocation of these programs in the thirteen representative prefectures of the country. As revealed from the questionnaire, the percentage of trained teachers was low. The number of environmental education programs realized in Lower Secondary Schools was satisfactory, while in Unified Upper Secondary Schools the number of programs was very small.

In view of the above, Pedagogical Institute:

a) Sent guide – lines on the realization of E.E programs to secondary schools with the view to confronting problems jointly and to favoring a greater development of such activities. Such a move does not fully cover the existing needs, but it is a first step until a Guide of Environmental Education will be drawn up for secondary schools.
b) Proposed that E.E. should be turned from an optional choice into a formal part of the official educational curriculum.

Another point highlighted in the questionnaire is the students' reluctance to participate in environmental programs. For this reason, the Pedagogical Institute encourages upper secondary school students to undertake projects dealing with an E.E. subject in the context of an optional subject instead of realizing E.E. after- school activities.

As far as the supporting material is concerned the Pedagogical Institute:

a). Incorporated environmental issues in the new books that are being written, and
b) Favored the writing of a reference book about E.E. for educators in secondary schools, which will contribute, along with the training, to the teachers' guidance, mainly those of insular and mainland areas.

Finally, a website of the Environmental Education has been recently created in the Pedagogical Institute for the exchange of ideas and views and for the information of all those interested in the realization and promotion of the E.E. programs in schools.

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