

Survey on European Environmental Education programmes to aid Sustainable Economic Development

The purpose of the surveys was to ensure that the training materials produced in the project satisfy the needs of the end-users. Surveys were conducted at five educational levels:

- LEVEL 1 Kindergarten/Primary Schools in Bulgaria**
- LEVEL 2 Secondary Schools in Italy**
- LEVEL 3 Vocational Training in Spain**
- LEVEL 4 Informal Adult Learning in Finland**
- LEVEL 5 Further and Higher Education in the United Kingdom**

For each LEVEL, the adopted approach followed a similar pattern:

- 1. Review of courses**
- 2. Development of Initial Curricula**

This was the same for each LEVEL:

Global and Local (EU level) Environmental Problems
 EU Environmental Legislation
 EU Environmental Standards
 Implementing Environmental Standards
 Technical Environmental Auditing (Energy, Water, Materials and Waste)
 Economics
 Environmental Economics
 Energy, Water and Materials conservation measures
 The use of Renewable Systems for Sustainable Development
 Pollution Reduction
 Waste Minimisation

- 3. Circulation of a NEEDs questionnaire to Teachers, Students, Employers and Environmental Organisations**
Whilst the questions were in general the same for each level, the questionnaires were modified to fit the requirements at each level:

Topic	Teachers	Students	Employers	All
	Does your course include this topic?	Are you interested in this topic?	Are there employment opportunities for persons trained in this topic?	Should the ELEVATE Courses include this topic?
Environmental problems				
Global Warming				
Climate Change				
Ozone Layer Depletion				
Energy Use				
Air Pollution				
Water Use				
Water Pollution				
Uses of Materials				
Waste Mountains				

Environmental Assessment				
Energy Auditing				
Water Auditing				
Waste Auditing				
Energy Conservation				
Water Conservation				
Materials Conservation				
Waste Minimisation				
Pollution Reduction				
Money Saving Possibilities				
Renewable Systems				
Sustainable Development				
Other <i>please specify</i>				

For teachers and students only

Didactic Technology	Does your course use this technology?	Should your course use this technology?	Comments
Talk and Chalk			
Paper Books			
Interactive Whiteboards			
MultiMedia Elements: Sound, Digital video, animations, sound, interactivity, simulations			
TV/VHS tapes			
CD ROMs/DVDs			
In Class Projection			
Computer based training (CBT)			
Tablet PCs			
E-books/E-textbooks			
Web –based (WBT) Learning			
Wireless Networking			
Other <i>Please specify</i>			

4. Analysing the responses**5. Refining the Curricula according to the analyses of the responses**

LEVEL 1 Kindergarten/Primary Schools in Bulgaria

The Bulgarian research showed that the curricula for environmental education in kindergartens and elementary schools should undergo a slight correction and simplification according to the existing guidelines for primary educational content and the general guidelines for pre-primary education. The curricula should reflect the recommendations of educational experts, psychologists and teachers who are directly involved in the educational process. The objective is to provide opportunities for all children to develop in each of the physical, socio-emotional and intellectual areas while acquiring knowledge, skills and abilities which will be needed for the future development of their potential.

It should be noted that computers can offer a variety of learning opportunities for children provided that the educational content is developmentally appropriate. If this requirement is met computers will surely facilitate building critical and creative thinking skills in children. The appropriate educational material can give more precise and specific visual information and will draw the child's attention to particular aspects enabling it to ask additional questions and investigate further. This will also assist in the transition from a general point of view of the environmental issues to a more detailed, complex and profound approach.

According to the obtained results it's preferable to divide the content for the proposed educational curriculum in two basic developmental stages. The first stage is the so-called general or introductory stage and should enrol children from the pre-school or kindergarten and early primary school age, i.e. children at the age from 3 to 7 years (kindergarten period) together with pupils at the age from 7 to 8 years (first and second grade). The second stage is the so-called transitional stage and includes the later primary school period which consists of pupils at the age of 9-10 years (3rd and 4th grade).

Usually these stages have different arrangement – the widespread methodology is based on a preschool period (3-7 year-olds) and primary school period (7-10-year-olds). This division is more obvious and easy to make with respect to the differentiated types of educational processes that the children are involved in. However in our case it's recommended to slightly modify these timeline limits in order to take into consideration the existing guidelines and educational curricula for primary school students. The 3rd and 4th grades are considered more important for the children in regards to transition from general to more specific in-depth educational content, thus the earlier years of education are regarded as providing more overall and universal knowledge without considering all the details or specific aspects of environmental education.

One of the implicit prerequisites for the environmental education curricula for kindergartens and primary school is the adaptation and simplification of the educational material by adhering to the educational guidelines and elimination of superfluous details. The target groups' age is highly determinant of the educational content and the methods for delivering it.

The opinion of educational experts, psychologists and teachers shows that only a couple of topics are appropriate for the first stage of delivering environmental educational content to children (kindergarten and early primary school). Thus the selection was narrowed down to: *Energy, Water and Materials conservation measures* and *Waste Minimisation*. These topics should be presented in a broader view and should conform to the educational standards and expected educational results assigned to the target groups' age and development boundaries. The aim is to offer an activity-centred program with suitable learning activities for all children at this stage. The educational environment for this stage should be planned thoroughly so that the children can try new ideas and skills and later apply what they have learned. The educational content should allow the children to play and explore since this is the way that they familiarise with new things and understand the world around them. It is strongly suggested that much of the children's early learning is achieved through play, therefore the opportunity to play should be a key aspect of the implementation of the educational process in the curricula. The creativeness could be further

stimulated with the use of images which will allow the children to steadily store the perceptions of the world around them.

However it shouldn't be forgotten that all aspects of children development are interrelated and growth and learning are continuous processes which cannot be put into fixed boundaries but rather should follow some general expectations and guidelines. This allows for designing educational materials that are applicable to children from both stages (kindergarten and primary school altogether). Nevertheless, distinguishing between the two will allow to meet the specific educational needs of the children in the second stage (late primary school, i.e. 3rd and 4th grade) who tend to become more observant of their surrounding and develop a greater awareness of their environment and move from the general ideas to more specific details.

In this case it is recommended to follow the established guidelines for late primary environmental education. The nationally adopted educational program suggests that 2 of the educational disciplines for 3rd and 4th-graders should acquaint the children with some of the environmental issues. These disciplines are Man and Society and Man and Nature. The children are expected to give examples of the consequences from human intervention with Nature, to recognise the positive or negative (harmful) interactions, to be able to follow the changes in the environment due to technological progress, to be familiar with the necessary measures for environmental protection, to get acquainted with the basic sources of energy and the newly developed materials. They should also have a basic idea of purification plants and the different ways of Nature contamination and preservation. The students should also learn about the human activities which lead to disturbing the equilibrium of Nature, about the harmful substances and their impact on human health. They should be able to identify the different sources of energy (air and water generated energy, solar energy, fuel energy, food energy) and its usage in everyday life, transport and even in the vital processes of living organisms.

This educational period (late primary school) is considered to be a preparation for the transition to secondary education, therefore a lot of effort is dedicated to bringing an awareness in children for the necessity of objective evaluation and self-evaluation. This is a stage in which the independent work is being increased at the expense of collective work. The creation, dissemination and delivering of environmental educational content to students at this age aims at providing the foundation for the development of the initial concepts and ideas of human environment. This is the base for the cultural-educational area called Nature Sciences and Ecology and the students get prepared for the more complex and detailed educational process in secondary education which includes new disciplines like Biology, Health education, Physics and Astronomy, Chemistry, Ecology and Environmental protection. This preparation has two aspects: the first is related to learning the specific terminology and concepts of different science areas as well as getting acquainted with the various methods for research and studying of the environment. The second aspect involves the creation of positive attitude in children towards Nature and sciences. The educational process during this stage demonstrates integral characteristics because the educational content isn't based only on one scientific area but rather on the interrelation and combination of a multitude of information and the different methods of knowledge acquisition.

Thus the recommendations of the educational experts point towards the usage of topics like *Global and Local (EU level) Environmental Problems, Energy, Water and Materials conservation measures, Pollution Reduction, Waste Minimisation* in the educational curricula of children in the second half of primary education. It should be noted again that the educational content should be adapted and reduced in complexity and extent in order to meet the developmental requirements of the children at the age of 9 to 10 years.

Overall there are no major changes in the initially developed curricula for kindergarten and primary school environmental education. While no new subjects are proposed to be added to the curricula, it is evident that some of the existing subjects should be left behind in order to achieve

the necessary adaptation and simplification of the educational content for the specific target group.

Final Curricula

- Global and Local (EU level) Environmental Problems – second environmental educational stage (3rd and 4th grade)
- Energy, Water and Materials conservation measures – first and second stage (kindergarten period and first half of primary education, together with the second half of primary education)
- Pollution Reduction – second stage (3rd and 4th grade)
- Waste Minimisation – first and second stage (kindergarten period and first half of primary education, together with the second half of primary education)

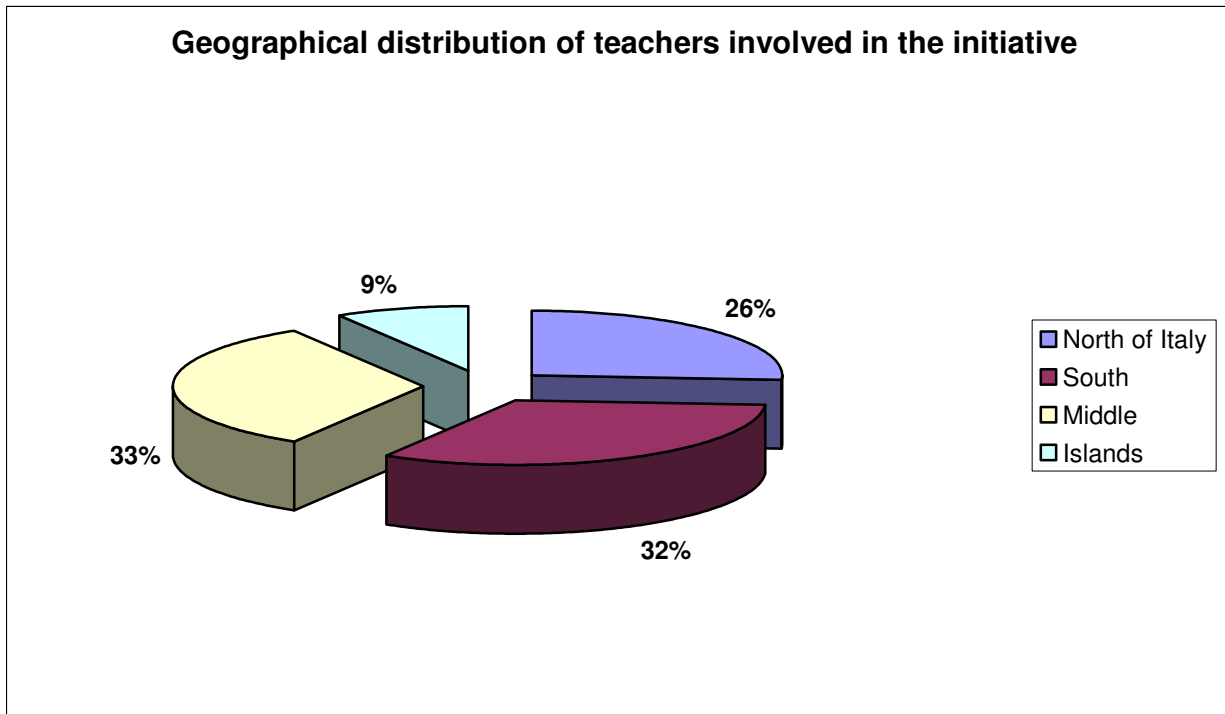
LEVEL 2 Secondary Schools in Italy

104 relevant Schools were identified in Italy.

46 teachers/tutors responded to the administered questionnaire, 10 of primary schools and 36 of secondary schools.

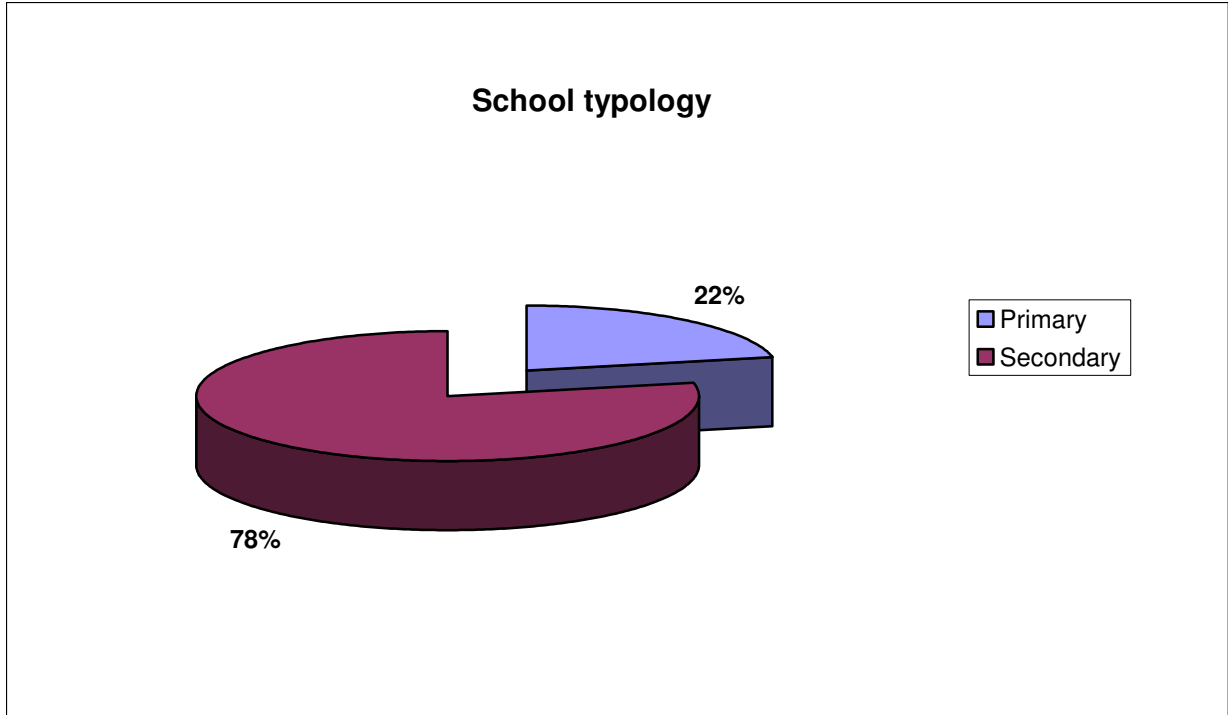
Geographical distribution of teachers involved in the initiative

North of Italy	12
South	15
Middle	15
Islands	4



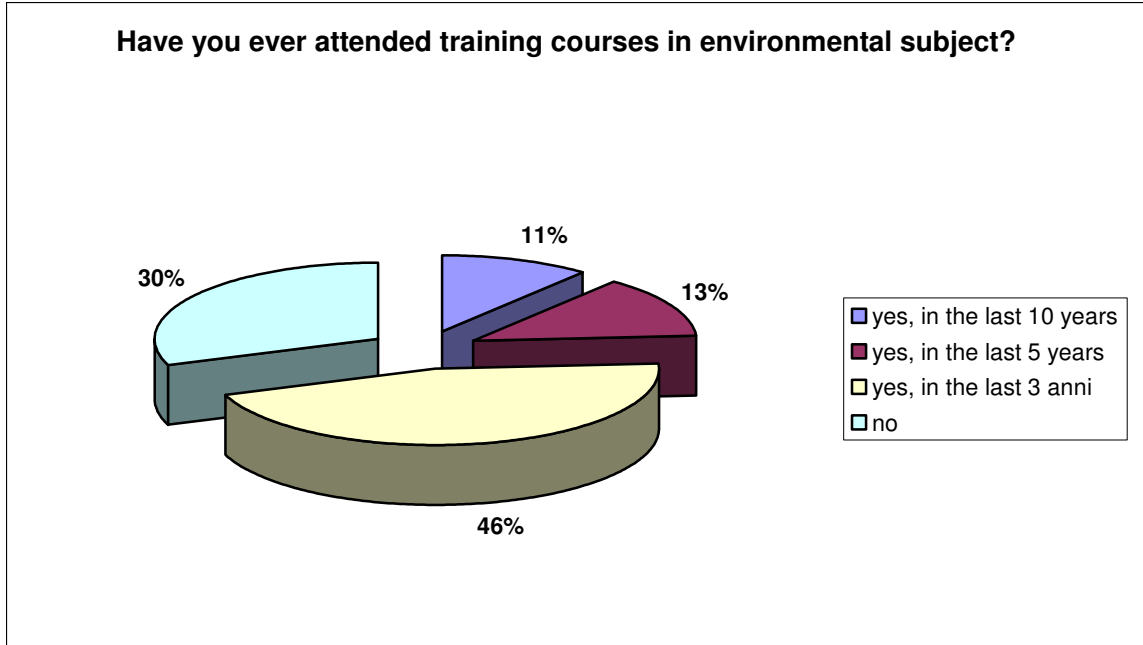
School typology

Primary	10
Secondary	36



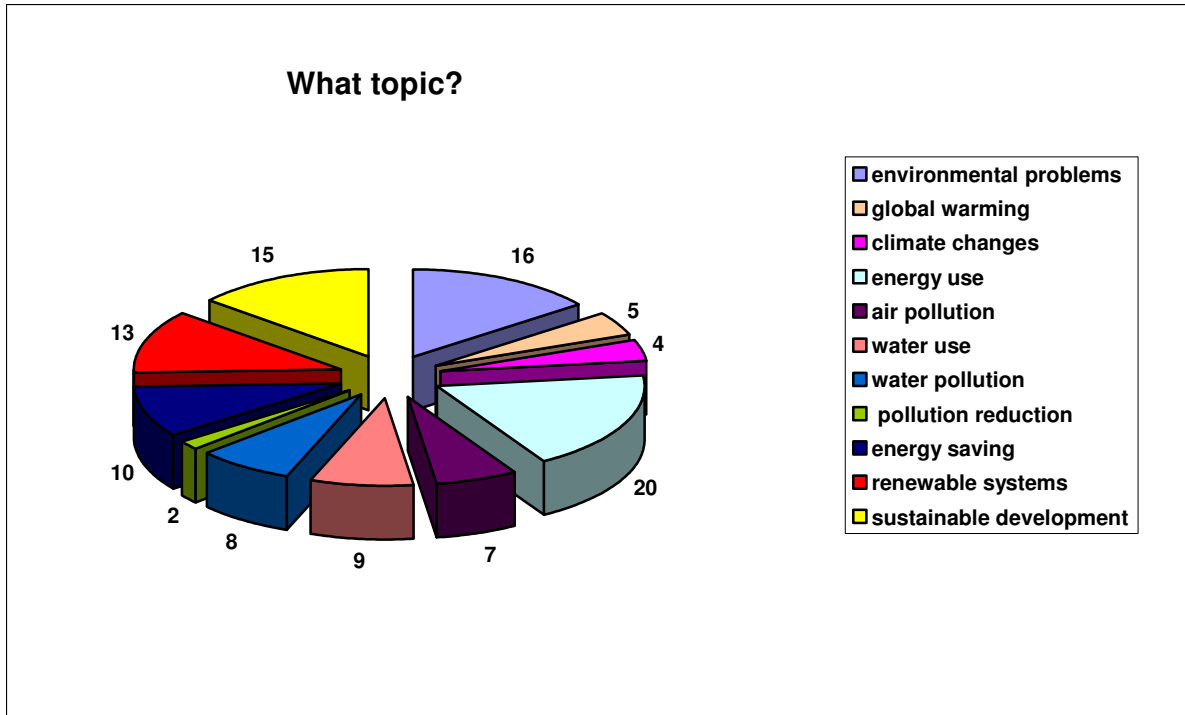
Have you ever attended training courses in environmental subject?

yes, in the last 10 years	5
yes, in the last 5 years	6
yes, in the last 3 years	21
no	14



If yes, about what topic?

environmental problems	16
global warming	5
climate changes	4
energy use	20
air pollution	7
water use	9
water pollution	8
pollution reduction	2
energy saving	10
renewable systems	13
sustainable development	15
other	

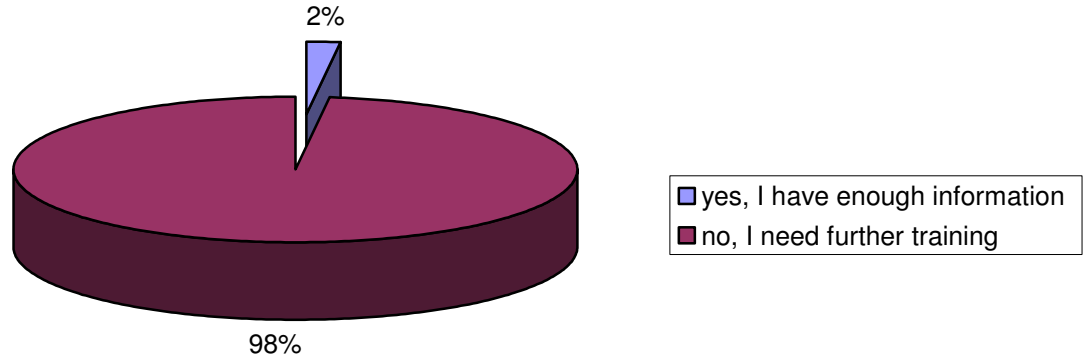


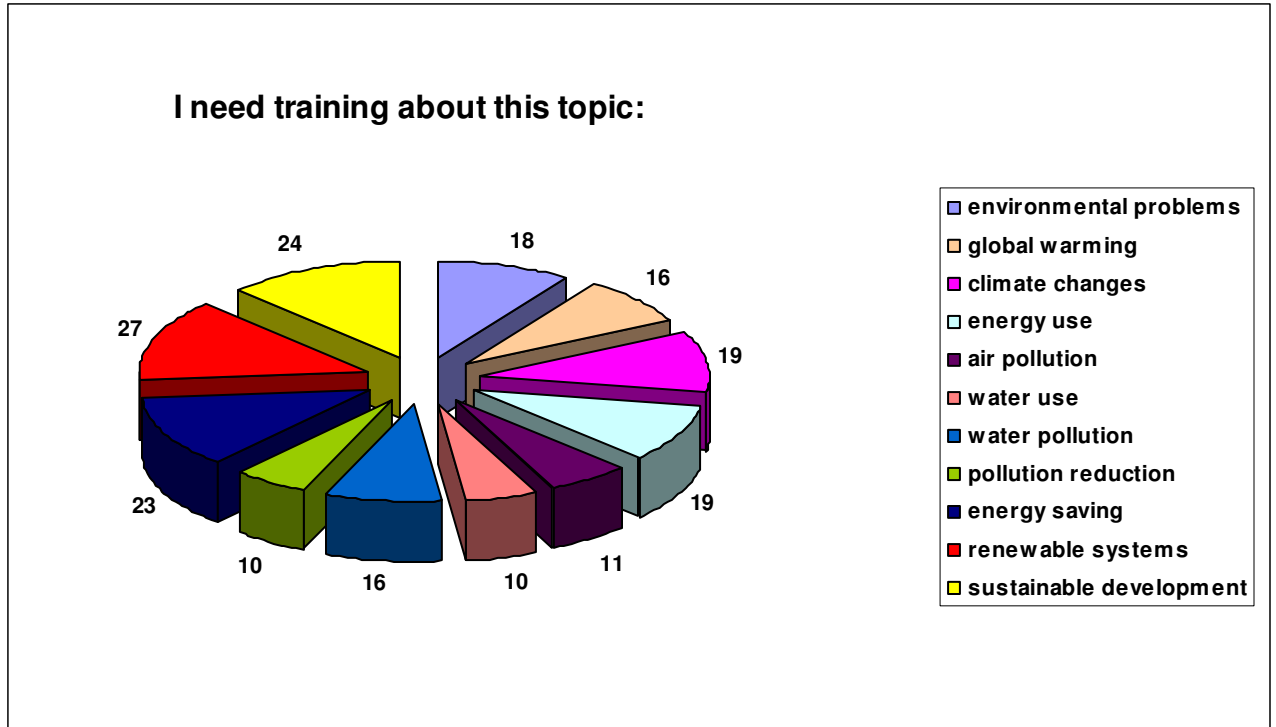
Do you suppose your knowledge is enough or you should improve it?

yes, I have enough information 2%
no, I need further training 98%

environmental problems	18
global warming	16
climate changes	19
energy use	19
air pollution	11
water use	10
water pollution	16
pollution reduction	10
energy saving	23
renewable systems	27
sustainable development	24
other	

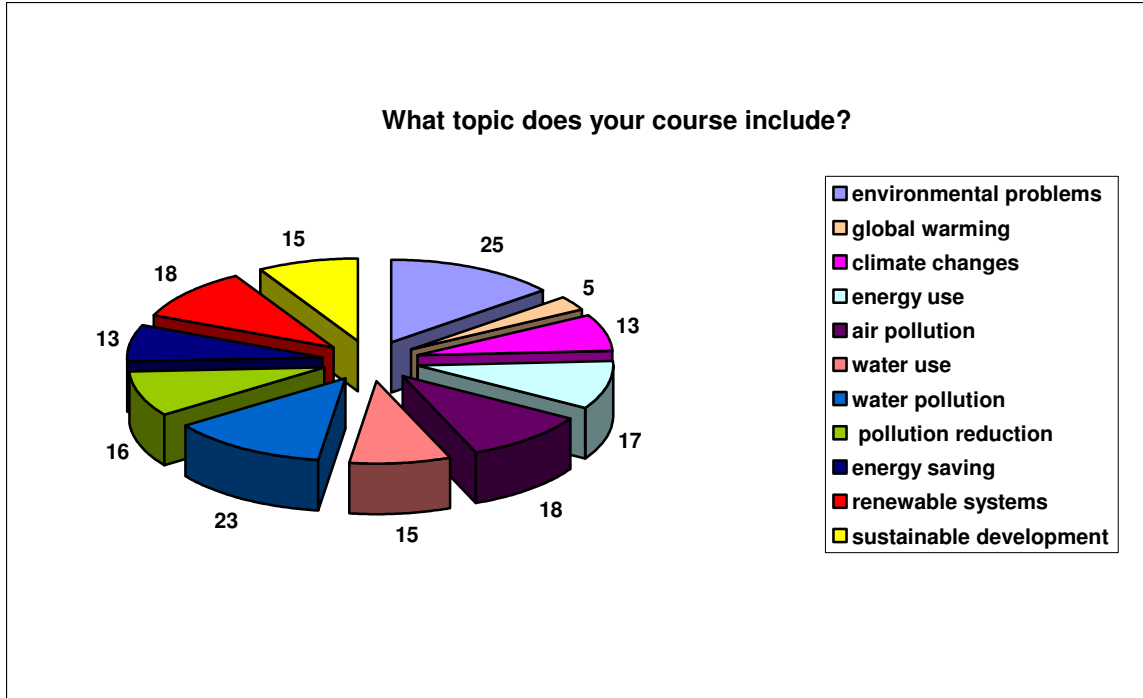
Do you suppose your knowledge is enough or you should improve it?





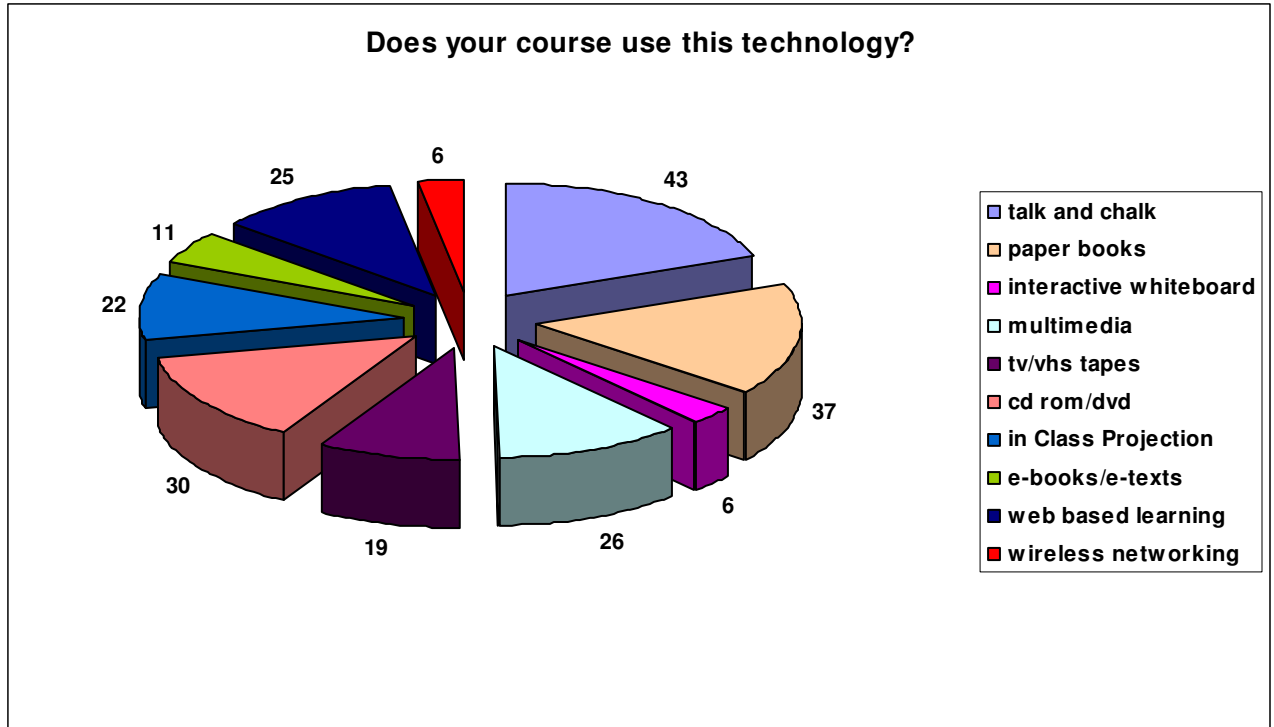
What topic is included in your course?

environmental problems	25
global warming	5
climate changes	13
energy use	17
air pollution	18
water use	15
water pollution	23
pollution reduction	16
energy saving	13
renewable systems	18
sustainable development	15
other	



Does your course use this technology?

talk and chalk	43
paper books	37
interactive whiteboard	6
multimedia	26
tv/vhs tapes	19
cd rom/dvd	30
in Class Projection	22
e-books/e-texts	11
web based learning	25
wireless networking	6
other	

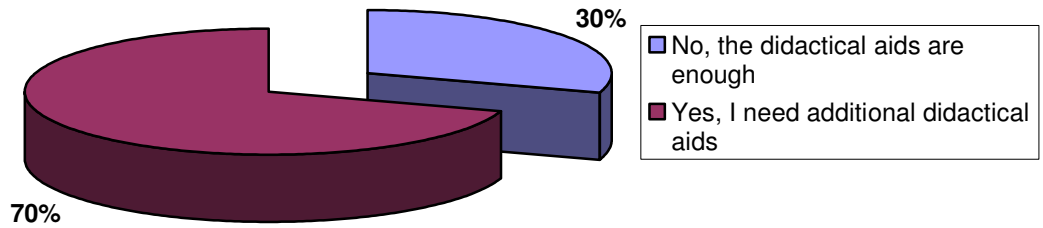


Should your course use other technology?

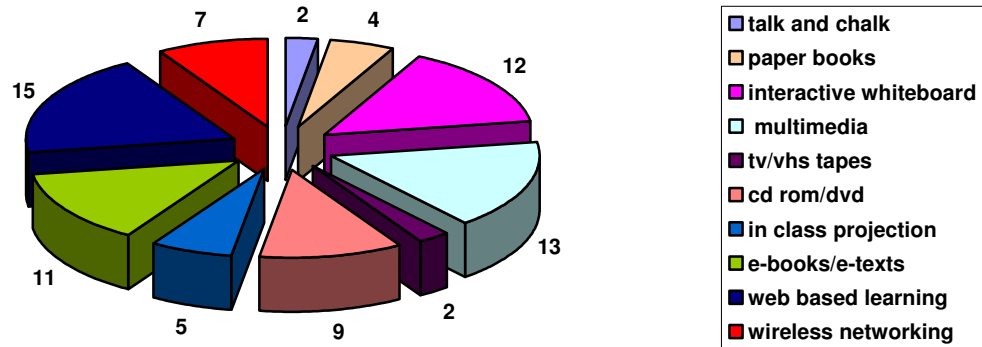
No, the didactical aids are enough 30%
Yes, I need additional didactical aids 70%

talk and chalk	2
paper books	4
interactive whiteboard	12
multimedia	13
tv/vhs tapes	2
cd rom/dvd	9
in class projection	5
e-books/e-texts	11
web based learning	15
wireless networking	7
other	

Should your course use other technology?



I need additional aids, especially:



Final Curricula

Global and Local (EU level) Environmental Problems
 EU Environmental Legislation
 EU Environmental Standards

Implementing Environmental Standards
Technical Environmental Auditing (Energy, Water, Materials and Waste)
Economics
Environmental Economics
Energy, Water and Materials conservation measures
The use of Renewable Systems for Sustainable Development
Pollution Reduction
Waste Minimisation

LEVEL 3 Vocational Training in Spain

10 Employer organisations/recruitment agencies and the 20 Courses were identified.

Final Curricula

- Global and Local (EU level) Environmental Problems
- EU Environmental Legislation
- EU Environmental Standards
- Implementing Environmental Standards
- Technical Environmental Auditing (Energy, Water, Materials and Waste)
- Economics
- Environmental Economics
- Energy, Water and Materials conservation measures
- The use of Renewable Systems for Sustainable Development
- Pollution Reduction
- Waste Minimisation

LEVEL 4 Informal Adult Learning in Finland

Please see **European perspectives on and info about Finnish Environmental education**

LEVEL 5 Further and Higher Education in the United Kingdom

Existing Provision in Environmental Training

A database of UK courses relating to the environment was constructed. 118 colleges and universities professed to offering 1165 environmentally-related undergraduate (Diplomas, BA and BSc Degrees) and postgraduate (MA and MSc Degrees). In the UK, the environment is a popular area for prospective students and the database shows that 1062 of courses are in existing subjects with the word “environment” added to attract students (e.g. Environmental Biology, Environmental Chemistry, Environmental Microbiology, Creative Writing and Environmental Studies, Environmental Science and Drama, Business Computing and Environmental Science, etc. In a modularised environment, an environment module can be tacked on to any subject. Eliminating irrelevant and combined courses and non-technical courses, the list of environment courses reduces to 103.

The websites of these 103 courses were visited to discover if they contain environmental legislation, environmental standards, energy, water and waste management, multimedia materials, e-books and web-based elements. 19 of these courses were not found at the college sites, 64 of these courses were in subjects such as agriculture, forestry, biodiversity conservation, land management, ecological and physical sciences, biology, earth sciences, chemistry, physics, built environment, coastal conservation, earth sciences, atmospheric sciences, ecology, ecosystems, geography, biosciences, health and safety, horticulture, land economy, nature conservation, ocean and Environmental Sciences and life sciences and so not relevant to the subject matter and the course proposed.

The remaining 20 courses each had some small elements of the proposed technical subject matter and this indicates that the proposed e-book course is indeed innovative and needed.

None of the courses examined contained e-learning, e-books or web-based activities to any great extent.

Members of the initial target group were recruited from the tutors and students of the 20 courses identified in the UK .

A further 20 university courses were identified in Bulgaria.

A database of UK employer organisations was constructed.

Initial Curricula

- Global and Local (EU level) Environmental Problems
- EU Environmental Legislation
- EU Environmental Standards
- Implementing Environmental Standards
- Technical Environmental Auditing (Energy, Water, Materials and Waste)
- Economics
- Environmental Economics
- Energy, Water and Materials conservation measures
- The use of Renewable Systems for Sustainable Development
- Pollution Reduction
- Waste Minimisation

10 Employers/Organisations responded to the survey

Employment Opportunities

- 100 Environmental problems
- 100 Energy Use
- 100 Air Pollution
- Environmental
- 100 Assessment
- 100 Energy Auditing
- 100 Water Auditing
- 100 Waste Auditing
- 100 Energy Conservation
- 100 Water Conservation
- 100 Materials Conservation
- 100 Waste Minimisation
- 100 Pollution Reduction
- Money Saving
- 100 Possibilities
- 100 Renewable Systems
- Sustainable
- 100 Development
- 95 Water Use
- 95 Water Pollution
- 95 Uses of Materials
- 85 Global Warming
- 85 Climate Change
- 80 Ozone Layer Depletion
- 80 Waste Mountains
- Other (please specify)

Responses were extremely positive. There are employment opportunities in all the technical subjects listed in the initial curricula.

Should ELEVATE include this Topic?

- 100 Environmental problems
- 100 Energy Use
- 100 Air Pollution
- Environmental
- 100 Assessment
- 100 Energy Auditing
- 100 Water Auditing
- 100 Waste Auditing
- 100 Energy Conservation
- 100 Water Conservation
- 100 Materials Conservation
- 100 Waste Minimisation

- 100 Pollution Reduction
Money Saving
- 100 Possibilities
- 100 Renewable Systems
Sustainable
- 100 Development
- 95 Climate Change
- 95 Water Use
- 95 Water Pollution
- 95 Uses of Materials
- 90 Ozone Layer Depletion
- 90 Waste Mountains
- 85 Global Warming

No respondent suggested deletions from these subjects.

One respondent suggested that Energy Policy Supply and Distribution should be added to the curricula but it was considered that this was a parochial topic specific to individual countries and not to the EU as a whole.

One respondent suggested Environmental Impact. This is included in the Energy, Water and Materials auditing procedures.

One respondent suggested Acoustic Noise Pollution. This is included in WP2.1: Implementing Environmental Standards.

One respondent suggested Contaminated Land. This is included in WPs 2.2.4: Materials and 2.2.5: Waste and in WP 3.4:

An online DATABASE of cost-effective retrofit options covering:

- Energy conservation measures
- Water conservation measures
- Materials conservation measures
- Waste Minimisation

The use of Renewable Systems for Sustainable Development

Air Pollution Reduction
ELEVATE Emissions to Air Checklist and Clean up Techniques

Water Pollution Reduction
Land Pollution Reduction

21 Students responded to the survey.

**Are you interested in this
Topic?**
Priority List

- 105 Renewable Systems
Sustainable
- 105 Development

- 86 Waste Minimisation
- Money Saving
- 86 Possibilities
- 81 Environmental problems
- 81 Climate Change
- 81 Uses of Materials
- 81 Materials Conservation
- 81 Pollution Reduction
- 76 Energy Use
- 76 Waste Mountains
- 71 Global Warming
- 67 Water Use
- Environmental
- 67 Assessment
- 62 Ozone Layer Depletion
- 62 Energy Conservation
- 60 Air Pollution
- 48 Water Conservation
- 43 Energy Auditing
- 38 Water Pollution
- 38 Water Auditing
- 38 Waste Auditing

**Should ELEVATE include
this Topic?**

Priority List

- 86 Renewable Systems
- 81 Environmental problems
- 81 Pollution Reduction
- Sustainable
- 81 Development
- Money Saving
- 71 Possibilities
- 67 Water Use
- 67 Uses of Materials
- Environmental
- 67 Assessment
- 67 Materials Conservation
- 62 Global Warming
- 62 Climate Change
- 57 Ozone Layer Depletion
- 57 Energy Use
- 57 Energy Auditing
- 57 Waste Minimisation
- 55 Air Pollution
- 52 Water Auditing
- 52 Waste Auditing
- 52 Energy Conservation
- 48 Water Conservation
- 43 Water Pollution

38 Waste Mountains

Whilst no respondents suggested deletions from these subjects, preferences were clear. Special mentions were made of Renewable Systems and Sustainable Development and Pollution Reduction was suggested as a priority.

No respondent suggested additions to the initial curricula.

10 Course Directors/Tutors responded to the survey.

Does your course include this Topic?

- 60 Environmental problems
- 60 Energy Use
- 60 Energy Conservation
- 60 Sustainable Development
- 50 Global Warming
- 50 Environmental Assessment
- 50 Renewable Systems
- 45 Water Use
- 45 Uses of Materials
- 45 Water Conservation
- 40 Climate Change
- 40 Energy Auditing
- 40 Money Saving
- 40 Possibilities
- 35 Materials Conservation
- 35 Waste Minimisation
- 30 Ozone Layer Depletion
- 30 Air Pollution
- 30 Waste Mountains
- 25 Water Pollution
- 25 Pollution Reduction
- 20 Waste Auditing
- 10 Water Auditing

The courses surveyed were heavily biased towards Energy Use and Conservation. Water and Materials uses and conservation were afforded low priorities. This suggests that the courses on offer did not include some of the student's expectations in materials conservation and waste minimisation.

Should ELEVATE include this Topic?

- 65 Energy Use
- 65 Uses of Materials
- 65 Energy Conservation
- 65 Renewable Systems
- 60 Money Saving

	Possibilities
55	Environmental problems
55	Water Pollution
55	Waste Mountains
	Environmental
55	Assessment
55	Energy Auditing
55	Waste Auditing
55	Water Conservation
55	Materials Conservation
	Sustainable
55	Development
50	Global Warming
50	Waste Minimisation
50	Pollution Reduction
45	Water Use
45	Water Auditing
40	Climate Change
40	Ozone Layer Depletion
40	Air Pollution
	Other (please specify)

No respondent suggested deletions from the initial curricula and no other subjects were suggested.

An overall analysis of the data produced the following priority list:

Should ELEVATE include this Topic?

84	Renewable Systems
79	Environmental problems
	Sustainable
79	Development
	Money Saving
77	Possibilities
77	Pollution Reduction
76	Uses of Materials
74	Energy Use
	Environmental
74	Assessment
74	Materials Conservation
72	Energy Conservation
71	Energy Auditing
69	Waste Auditing
69	Waste Minimisation
69	Water Use
68	Water Conservation
66	Water Auditing
66	Climate Change
66	Global Warming

- 65 Air Pollution
- 64 Water Pollution
- 62 Ozone Layer Depletion
- 61 Waste Mountains

It was concluded that, whilst no changes to the initial curricula emerged, the ELEVATE team should take this priority list into account when preparing the course materials.

Final Curricula

Global and Local (EU level) Environmental Problems
EU Environmental Legislation
EU Environmental Standards
Implementing Environmental Standards
Technical Environmental Auditing (Energy, Water, Materials and Waste)
Economics
Environmental Economics
Energy, Water and Materials conservation measures
The use of Renewable Systems for Sustainable Development
Pollution Reduction
Waste Minimisation

It is expected that 100 institutions will become involved initially to participate in the project in developing, testing and refining the results. In return for enrolling at the project web-site and answering the various questionnaires therein, these members will have access to all the project outputs, including the e-course, and selected members will be invited to the workshops, where e-learning methodology and e-book construction will be themed alongside the technical environmental subject matter.

At least 10 employer organisations/recruitment specialists were selected in each partner country. These organisations will be provided with details of the ELEVATE project and will be invited to enrol at the web-site, where a special short form interactive questionnaire will be provided for them.

As a result of this research, the database of prospective end-users contains 569 names and email addresses.