Conceptual Perception Of The Natural Environment
Year 2000-Valencia Polytechnic University

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Background:
The University´S Responsibility To The Natural Environment

Presently, Spanish universities are subject to the Organic Law of the Universities. As far as these normative texts are concerned, the demand of a guarantee of quality (Art. 31) was introduced in this Law by means of a series of assessment, certification and accreditation processes. These functions correspond to the National Agency of Assessment and Accreditation (Art. 32) (Peris Mora, E. EMSU Conference, 2002).

Quality Management Systems (QMS) have been imposed upon the business world as a consequence of the global market pressures. Anything may be purchased from anywhere, and only the "most apt" survive by offering the best products and services to a universal clientele.

Quite the opposite to what would be ideal, universities are not always an ideological driving force for the best innovations –they should be so for good innovations- since there are times when they are pushed by "external forces" that place pressure on structures that occasionally evolve too slowly. Universities are companies that provide services and it seems logical that they ought to be subjected to the same "good management" obligations as the rest of the organizations that society creates to solve its necessities with whatever expressions are required. Higher Education Institutions attempt to cover the need to train professionals and artists of the highest level. They develop investigation programs and they should favour the development of technology, theoretical thinking and artistic creation. Universities have more or less successfully taken on such responsibilities for centuries, and it is most likely because of this that the university has always had a relatively high social prestige..

It is assumed that the university is socially important, perhaps through the "training effect" consequences it performs on society; both through what the regulated education is made up of –careers- as well as, and what is becoming more important, pre- and post-professional training, masters, business professional training and technological and basic research. Whether there is an employment crisis or not, within ten years companies, administration and services (and all the levels of the government) will have admitted those professionals who are presently in the university lecture rooms: shortly after, these professionals will occupy management posts (UNESCO, 83).

Doubtlessly environmental management is one of the fields where many of the professionals of the future will be committed to in their different disciplines. Over the last few years, certain universities worldwide have become concerned about an aspect of their

activities that gave rise to potential impacts on the natural environment (Holt and &col. 97; Rodgers, 97; Rosennorn, 97; Van Volsen, 97). They began paying attention to the teaching and investigation activity of laboratories and workshops situated in campus for many years, which were producing dangerous waste, that was merely and carefully poured straight into the drains of the sewer system or placed with the urban waste formed in the campus. The introduction of a Standardized Environmental Management System (ISO 14.001 or European Regulation 761/2001) is an instrument that: guarantees that the recommendations made are fulfilled: establishes an environmental risk study of the place where the activity is being developed: and minimizes the negative effects that may take place (Peris Mora, E, 2002).

The universities´ participation in the activity of attaining a sustainable human society has to pass through the "sustainable management of the university's own activity". The companies of the produce sector and other organizations of the services sector must plan their proceedings so that their environmental impact is reduced to a minimum as much as possible. The most important aspects that both companies and organizations must study thoroughly are the consumption of raw materials and the products and waste that are generated. As for the university, its main product is that of training professionals and producing science and technology, and the analysis of the inputs and outputs of these organizations is particularly delicate.

Environmental Management Systems And Analysis Objectives

The Environmental Management System (EMS) in universities is compelled to design "procedures" through which the "training effect assessment" becomes possible, which represents the main aspect to be considered in the environmental diagnosis of these institutions. This investigation work intends to develop criteria –scientific and ethical- concerning the natural environment matter among the students who pass through university in any of its specialities. The initiative to achieve this objective embarked upon is that of conducting a study on "the perception or concept of the natural environment" among university students.

The justification of undertaking a survey covering the students´ personal opinion and position on the natural environment is to obtain objective information which justifies the procedures taken towards, and the purposes of reaching any EMS in the university.

The final objectives of this study are at the same time both management and training objectives. The management will improve if a better participation of the university collective is achieved; the training objectives will be achieved when the natural environmental perception of the students, for whom the management is programmed, is better known, as well as favouring the participation of this collective in the management – with what training represents through action.

This work also intends to conduct a study which is compared with other universities, by extending the analysis to different collectives.

In this way, this particular investigation intends to provide answers from the survey developed by the Valencia Polytechnic University to the following questions:

- How do the university students interpret the natural environment?
- What is their level of awareness of the "crisis" and their personal position in the face of the natural environment?
- What are their personal tendencies regarding the natural environment?
- What degree of availability is there to participate in environmental management or in a socio-cultural activity?
- What is the personal analysis of one's own surroundings and its environmental self-esteem?
- What are the tendencies, attitudes, desires and availability for the participation?
- What are the responsibilities in the management of natural resources?
- What knowledge do the university people have about standardized Environmental Management Systems?
- What are the indicators that will define the possible student tendencies?

The intention is to establish a methodology/tool with the answers to these questions in order to measure the effect that environmental training has on the students while they are at University, where this measurement is an integrated part of the standardized Environmental Management Systems which are introduced in university institutions.

This study intends to identify the different personal conceptions, attitudes and positions on the "environmental conflict" of students at different levels, specialities and in different Spanish regions, by differentiating between colleges of engineering, empirical sciences and humanities. Likewise it intends to provide objective criteria and quantifiable results to be used in the design of training policies (environmental education within the university) that allow for a sustainable management of the university itself as well as contributing to university education towards global sustainability.

Material And Methods

The Survey
Justification Of Its Content

In general terms, the information sought refers to

a) general opinion aspects regarding the concept of the "natural environment"
b) critical sense of the negative and positive assessment of the situation
c) identification of tendencies and personal positions
d) a criterion is requested to attribute management responsibilities of certain natural environment aspects to different political or administration levels.

The perception of the natural environment from a conceptual point of view was attempted with the first general block of questions. Sections on the conception of the natural environment itself are included in this group (by contrasting natural, anthropic and social aspects), as well as the sense of crisis and the analysis of the immediate and nearby environment itself.

A second block of questions assessed the environmental self-esteem and the identification of personal tendencies (attitudes).

Finally, it is committed through "non innocent questions" (asked with the purpose where occasionally the student receives their first information on the theme) which deal with the public environmental management and that of the university itself.
The survey contains questions about:

1- *Identification data*
2- *Environmental conception*
3- *Sense of Crisis*
4- *Environmental self-esteem*
5- *Identification of personal tendencies*
6- *Analysis of the will to participate*
7- *Opinion regarding the management responsibilities*
8- *Attitude toward environmental problems*
9- *Knowledge about Environmental Management Systems (EMS)*

Classifying opinions by tendencies

With the intention to identify the indicators that will define the possible student tendencies, classifying the groups of answers to the survey sections to be analysed in this work into three categories was considered an interesting option (2. Environmental Conception, 3. Sense of crisis, 4. Environmental self-esteem, 5. Identification of personal tendencies: table 5.1)

The three tendency groups defined will be: a first group represented by the options that present a basically environmental character, called the natural character, a second group characterized by the influence of mankind, called the anthropic character; and finally, the

so-called social character, which groups the tendencies that refer to the present-day social problems.

The Sample Group

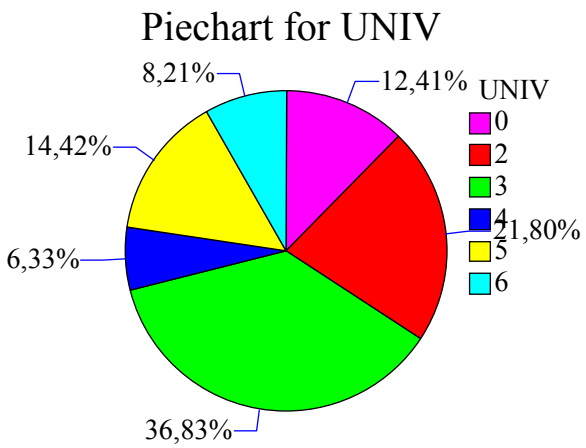
The only survey conducted was agreed by consensus on behalf of the 6 participating universities and was applied to the registered students throughout the year 2000 in the extension shown in Figure 1. These 6 universities were: Alicante University, Valencia University, Valencia Polytechnic University, Jaume I University in Castellón, Granada University and Extremadura University. The surveys were transferred to a general data base by using optical scanning systems provided by the Institute of Educational Sciences (ICE) of the Valencia Polytechnic University, and were transmitted to all the participants.

CONCEPTUAL PERCEPTION OF THE NATURAL ENVIRONMENT. YEAR 2000

TOTAL NO. OF PROCESSED SURVEYS: 5,811

UNIVERSITY	No. surveys In 2000	RELATIVE FREQUENCY
ALICANTE UNIVERSITY	721	0.1241
VALENCIA UNIVERSITY	1,267	0.2180
VALENCIA POLYTECHNIC UNIVERSITY (UPV)	2,139 (in 1995: 1,994 surveys)	0.3683
JAUME I UNIVERSITY OF CASTELLÓN	368	0.0633
GRANADA UNIVERSITY	839	0.1442
EXTREMADURA UNIVERSITY	477	0.0821

Figure 1



The statistical treatment of the data has been performed with the computer program: STATGRAPHICS PLUS version 5.0. Descriptive statistics tools have been used which allow the information of the sample group to be compiled in tables and graphs.

Development

A summary is offered for all survey sections, which consists of the first comparative analysis, but only of the first five blocks as they are considered suitable for the majority of the proposed objectives to be achieved.

1. Identification
2. Environmental conception
3. Sense of crisis
4. Environmental self-esteem
5. Identification of personal tendencies

The first tables intend to identify what the nature of conceptual perception is by differentiating if the student primarily has a concept of the natural environment or of the environmental crisis from the options selected: a) naturalistic; b) anthropic; c) social.
The naturalistic character concentrates on the answers that describe the natural environment as something which mankind is absent in, and they are represented by a green background in the tables; the anthropic perception, corresponding to the vision of nature being the provider of resources for human exploitation, is represented by a blue background in the tables. The social perception of the natural environment is that which integrates problems concerning inequality among social groups, poverty, conflicts among communities, etc; and is represented by a red background in the tables.

UPV comparative of the sample group from 1995 with the UPV sample group of the year 2000

The UPV sample group which formed part of the study conducted in 1995, consisted of a total of 1,914 processed surveys, whereas the number rose to 2,139 processed surveys in the year 2000.

Results

Natural environment conception

NATURAL ENVIRONMENT	UPV PERCENTAGE 2000	UPV PERCENTAGE 1995
Natural resource	65.78	50
Human relation with their surroundings	59.51	64.58
atmosphere	36.56	45.14
management of waste materials	34.88	33.96
plant subsoil	33.99	20.06
virgin nature	33.61	37.25
wild fauna	30.11	27.17
human life quality	26.04	30.67
Wild flora	24.45	23.15
nature reserves	19.92	18.18
sea	19.73	21.68
problems of lack-price of raw materials	10.28	8.88
freshwater	9.35	9.14
urban space	9.26	12.54
quality of food	5.70	3.66
Urban surface	4.39	2.98
thrid world environment	1.36	1.31

Sense of crisis.

Feelings towards the most important environmental threats.

ENVIRONMENTAL THREATS	UPV PERCENTAGE 2000	UPV PERCENTAGE 1995
Destruction of natural resources	72.32	66.61
Climatic changes	45.53	
Atmospheric pollution	44.37	56.95
Excess of waste production	39.41	48.43

Exhaustion of the ozone layer	37.82	43.57
Overexploitation of raw materials	25.53	24.61
Seas becoming contaminated	25.15	34.12
Excess energy consumption	24.68	24.14
Radioactive contamination	20.24	22.05
Freshwater becoming contaminated	19.49	19.54
Overexploitation of surface areas for construction	18.75	11.91
Desertification of rural areas	18.70	25.39
Population explosion	18.05	
Wars	12.29	13.22
Soil becoming contaminated	12.11	11.91
General life quality	10.89	12.17
Food poisoning	9.44	4.34
Noise pollution	9.26	7.89
Overexploitation of agricultural surfaces	8.74	5.69
Famine	7.57	6.22
Social conflicts	4.02	5.43
Problem of shanty towns	2.99	4.70
Urban public order	1.87	1.99

Feelings towards more important environmental threats in the professional area (University).

ENVIRONMENTAL THREATS UNIVERSITY	UPV PERCENTAGE 2000	UPV PERCENTAGE 1995
Wasting paper	43.57	44.72
Traffic problems to reach the University	41.00	47.81
Tobacco smoke in public places	39.74	
Overheavy atmosphere in lecture rooms	33.71	28.27
Wasting energy	30.86	31.24
Overcrowding	28.89	38.30
Lack and poor accessibility of green belt areas	22.63	19.91
Wasting water	21.22	22.73
Parking difficulties	18.23	16.30
Radiations from a computer screen	15.57	14.21
Improper management of organic waste	13.79	11.34
Noise in meeting areas (coffee shops, students room) or others	13.28	13.38
The distancing of the University to social problems of its surroundings	11.50	15.62
Risks of using solvents, glues, etc.	11.41	6.69
Use of toxic products in laboratories	10.80	6.84
Services in university coffee shops and dining areas	10.75	11.70
Toxic-carcinogenic pigments used in photocopy machines	10.66	10.24
State of the campus gardens	9.40	8.46
Toilet cleanliness	8.51	8.67
Improper management of glass waste	7.01	7.37
Toxic-carcinogenic use of printing toners	6.17	4.81
Dirty lecture rooms	5.94	6.32
Dirty class tables	5.89	6.58
Radiations emitted by photocopy machines	4.67	4.49

Environmental self-esteem.

Here in this section, there is no data available from the sample group study performed in 1995, so no comparative may be made.

Identification of personal tendencies.

Extra-academic Activities

ACTIVITIES	UPV PERCENTAGE 2000	UPV PERCENTAGE 1995
Sports practiced	49.60	53.40
Social activity: gathering for discussion or discotheque in groups	49.27	42.16
Cinema (spectator)	45.86	45.51
Trips to parks, nature trips	26.04	23.04
Literature	20.29	30.46
Music (play an instrument)	21.55	16.30
Sports-spectator	20.34	19.38
Gardening	7.43	4.44
Collecting	7.39	5.12
D.I.Y.	6.92	6.22
Religious activities	5.94	8.62
Ecologist or excursion associations	5.56	6.84
Theatre (spectator)	5.14	4.44
Writing theatre or amateur cinema	4.35	3.03
NGOs (altruism/charity, etc)	3.88	4.86
Party politics	2.66	2.25

Time spent on extra-academic activities

TIME	UPV PERCENTAGE 2000	UPV PERCENTAGE 1995
One/Two hours a week	44.93	46.39
One hour or more a day	39.13	34.17
One monthly session	5.61	3.92
An occasional session	5.10	3.76

Only in holidays	3.46	3.50

Comparative of the High Technical college of Civil Engineering (ETSICCyP) with the rest of the Colleges/Faculties of the UPV (Valencian Polytechnic University)

The ETSICCyP was analyzed by means of 394 samples when compared with the rest of the UPV (a further 1,745), and the following result was obtained:

2.- Environmental conception

ENVIRONMENT	REST OF UPV PERCENTAGE	ETSICCyP PERCENTAGE
natural resources	63.67	6578
relation of human beings with their surroundings	58.57	59,51
atmosphere	37.02	36,56
virgin nature	36.85	33,61
plant soil	33.41	33.99
waste management	33.35	34.88
wild fauna	32.32	30.11
wild flora	25.96	24.45
quality of human life	21.89	26.04
nature reserves	21.49	19.92
sea	20.34	19.73
problems with lack-price of raw materials	10.54	10.28
urban space	9.28	9.26
freshwater	9.00	9.35
food quality	6.19	5.70
urban surface	4.41	4.39
third world environment	1.49	1.36

Sense of crisis.

Feelings towards the most important environmental threats.

ENVIRONMENTAL THREATS	REST OF UPV PERCENTAGE	ETSICCyP PERCENTAGE
Destruction of natural resources	71.86	72.32

Noise pollution	52.38	9.26
Climatic change	45.27	45.53
Excess of waste production	39.71	39.41
Exhaustion of the ozone layer	39.31	37.82
Overexploitation of raw materials	26.25	25.53
Excess of energy consumed	24.64	24.68
Atmospheric pollution	22.23	44.37
Subsoil becoming contaminated	22.23	12.11
Seas becoming contaminated	20.11	25.15
Overexploitation of surface areas for construction	18.28	18.75
Desertification of rural areas	17.71	18.70
Population Explosion	16.91	18.05
Wars	12.72	12.29
Social conflicts	10.49	4.02
Freshwater becoming contaminated	10.20	19.49
General life quality	9.91	10.89
Food poisoning	9.74	9.44
Overexploitation of agricultural surfaces	8.60	8.74
Famine	7.05	7.57
Problems of shanty towns	4.18	2.99
Urban public order	2.12	1.87
Radioactive contamination	0.34	20.24

Feelings towards the most important environmental threats in the professional areas (University).

ENVIRONMENTAL THREATS UNIVERSITY	REST OF UPV PERCENTAGE	ETSICCyP PERCENTAGE
Wasting paper	45.67	43.57
Tobacco smoke in public areas	41.09	39.74
Traffic problems to reach the University	37.31	41.00
Overheavy atmosphere in lecture rooms	34.27	33.71
Wasting energy	30.09	30.86

Overcrowding	27.85	28.89
Lack and poor accessibility of green belt areas	23.78	22.63
Wasting water	20.63	21.22
Parking difficulties	17.82	18.23
Radiations from a computer screen	16.22	15.57
Improper management of organic waste	13.30	13.79
Noise in meeting areas (coffee shops, students room) or others	12.49	13.28
Risks of using solvents, glues, etc.	12.32	11.41
Use of toxic products in laboratories	12.21	10.80
Services in university coffee shops and dining areas	10.83	10.75
The distancing of the University to social problems of its surroundings	10.32	11.50
Toxic-carcinogenic pigments used in photocopy machines	10.20	10.66
State of campus gardens	9.68	9.40
Toilet cleanliness	9.57	8.51
Improper management of glass waste	6.76	7.01
Dirty lecture rooms	6.48	5.94
Toxic-carcinogenic use of printing toners	6.42	6.17
Dirty class tables	6.25	5.89
Radiations emitted by photocopy machines	4.53	4.67

The city or town you live in

POSITIVE NATURAL ENVIRONMENT VALUES	REST OF UPV PERCENTAGE	ETSICCyP PERCENTAGE
Green belt areas	32.49	32.54
Surrounding areas	26.07	26.37
Public services, transports, etc.	12.89	13.14
Urban landscape	12.84	12.95
The population and neighbourhood relationships	10.66	10.38

The University where you work/study

POSITIVE NATURAL ENVIRONMENT VALUES	REST OF UPV PERCENTAGE	ETSICCyP PERCENTAGE
Green belt areas	40.34	40.25
Surrounding areas	16.50	16.22
The population and neighbourhood relationships	15.59	15.15
Public services, transports, etc.	14.15	15.52
Urban landscape	6.30	6.45

Results And Discussion

Previous Opinion Studies On The University And The Environment

Empirical studies which centres on the population and their opinions and attitudes with regard to the natural environment is something relatively recent. García Ferrando (1991) presented results from a survey on the environmental problem from the Sociological Investigations Centres. This survey was conducted in October 1984, within a context of sociological thinking in which significant changes in the scales of values were detected in all the industrial societies. MOPTMA subsequently undertook other general studies on the theme, which enlarged upon the general knowledge obtained on the Spanish society. The CIRES report is a very complete study on the Spanish population regarding environmental themes (1994)[1]. Also, the studies conducted by Cabrejas y García (1993) are worthy of mention as a first study made on environmental attitudes carried out on the metropolitan area population of Valencia (Peris Mora, E., Montesinos, A., Palop, F. The students of the Valencian Polytechnic University and the Natural Environment; Opinion Study).

In spite of the fact that the most developed world continues producing important data on the natural environment, a series of initiatives is emerging from this same world that support a greater respect for nature. The concern to measure the opinions and attitudes of the population is registered in this framework, as well as the relation that this state of opinion has with the social action actually present.

Several cases using opinion studies have been found, based upon questionnaires and surveys on natural environmental themes focussed at different population sectors (Blomquist, G., Newsome, M. and Stone, B. (2003); Myatt, L.B., Scrimshaw, M.D. and Lester, J.N.(2003); Alessa, L., Bennett, S. and Kliskey, A. (2003); Zannin, P., Calixto, A.,

[1] A detailed description of these empirical studies is found in Gómez Benito and Paniagua Mazorra (1996) p. 135 ss.

Diniz, F. And Ferreira, J. (2003)), where the main opinion polls were performed in 2002 and included within the surveys made by Eurobarómetro (Comisión Européenne (2002) L´environnement? Ce que les Européens en pensent). Many analyses have been made but as far as we can see, none have been conducted with a university collective sample group.

As we have already mentioned, many of the present-day university students will be the professionals in ten years to come and they will occupy highly responsible decision-making posts. Therefore they will need to be aware of the sensitivity of such decisions towards the natural environment, not only interested in oneself, but also as a formative responsibility of those institutions in which the young adults study, supported by the scientific information available. This work is encouraged by the spirit to fulfil this responsibility.

By basing ourselves on the scientific method, which consists of forming questions on the reality, and based upon the already existing theory, and attempting to find solutions to those problems posed, this particular work is justified by the need to answer the following question:

Is the University training its students properly from a natural environmental point of view?

The first step to be taken in order to approach this question is to observe a limited part of the universe or single group that the sample group is made up of. What is observed should be noted, then the results obtained are to be organized into classified tables, to finally single out the most representative.

It is therefore necessary to start from the following hypothesis which this whole study is based upon in order to design the tools required to be able to answer this question correctly:

"The University has an effect on the students´ environmental conceptual perception".

By starting from this premise, not only does an instrument have to be designed and experimentation has to be conducted to demonstrate this, but also the question that arises is that if indeed this premise is certain, there is no method to date available to measure and quantify this effect.

A study was started in the Valencian Polytechnic University (UPV) in 1995 to demonstrate the work hypothesis which dealt with the environmental conceptual perception among students. The experimental part of this study was conducted by carrying out a first survey that consisted of approximately 2,000 questionnaires, in the UPV itself. References to this first survey are found in the annexes of this work (see Annex 1).

Therefore, the origin of this particular investigation was in this previous task conducted in 1995, which was presented in the First Sociological and Environmental Scientific Encounter: State of the Question, November, 1997 (Peris Mora, Montesinos, and Palop, 1999).

Given the opportunity offered by the Third OIUDSMA Congress which took place in Valencia (Spain) in December, 1999, a group of universities decided to participate in an initiative by following certain patterns based on that particular line of investigation. The general results obtained from this second application in the year 2000 were presented in the 7th Spanish Sociological Congress held in Salamanca (Spain) in 2001, which was the main aim of this work (Peris Mora, E., Martí, C., Capilla, C. and Palop, F.).

This study is only the start of what will be a more comprehensive, subsequent line of investigation, as we intend to repeat the survey in the year 2005 in order to establish a follow-up of the results that have been recently discovered. This follow-up will be based upon the comparative of the environmental conceptual perception of those students who will be studying the last year of their career, and who answered the survey while studying the first year of their career in the year 2000.

A UPV comparative between the sample group in 1995 and the UPV sample group in the year 2000.

Environmental conception

The most selected answer in the 1995 sample group was that concerning "the relation between human beings and their surroundings" (64.58%), followed by "natural resources (50%) and the atmosphere" (45.14%), and these coincide with the three same mostly selected answers in the 2000 sample group. There was only one difference, this being that the most popular answer in the 2000 sample group was "natural resources" (65.78%), followed by "the relation between human beings and their surroundings" (59.51%). The selection of the remaining values in both sample groups was always below 40%.

Given there were barely any changes between both analyses among the group of the three mainly selected answers, neither in the order they appear, suggests that the most widespread environmental vision remains within the so-called natural character group (green coloured), although one of the most chosen answers has a definite anthropic character (blue coloured). This result offers an odd bipolar reading regarding the relation mankind has with his natural surroundings. The relation of human beings and their surroundings may be mutually beneficial and mutually destructive, and natural resources, the atmosphere, the virgin nature and waste are considered as central themes of this relation.

It is also interesting to observe how the description of the negative pole of the tested items coincides in both sample groups, that is, those items that suggest the idea of being related to the natural environment to very few of our questioned students: especially the Third World scope, urban surface or food quality, where the so-called social character is highlighted (red coloured) are among those less selected. This leads to the understanding that these terms were neither considered nor are considered as forming part of the natural environment.

The only outstanding difference among the students interviewed in 1995, as opposed to those interviewed in the year 2000 is that the latter group considers that the plant subsoil as

a relevant aspect by placing it in fifth place rather the tenth place it was placed at with the 1995 sample group.

Sense of Crisis

Feelings towards the most important environmental threats

In both sample cases, the relation between mankind and his surroundings remains as a common element to characterize the way of thinking of our sample group. The problems that are mainly perceived in this relation are in the following order: destruction of resources, the climatic change (only shown in the 2000 sample group as it was not included in the 1995 survey), atmospheric pollution, excess waste production, exhaustion of the ozone layer, overexploitation of raw materials and the seas becoming contaminated. All these themes are linked to the abuse of taking advantage of the different ecological system capacities worldwide for human activity purposes. On the other hand however, there is only slight concern in both sample groups regarding those themes that are to do with social organization, such as famine, wars, shanty towns, etc.

We can observe the reflection of the professional orientation of these young adults in their concern for the natural resources, and perhaps a reflection of the training they impart. On the other hand, the five following themes have been broadly mentioned, both in scientific information as well as in the general information that the media provides. There have been occasions that these general themes have represented informative motives to a great extent, especially in important intergovernmental conferences. Agreements have been made and these agreements involve techniques to limit emissions, damages and consequences of human activities, many of which are often technological and have probably been the subject of teaching material in the different university centres. This could explain the specificity of the interviewed students´ conception regarding the more general study results in both analyses.

The items that occupy the sixth to the tenth places obtained between a quarter and a fifth of the total number of answers in the questionnaires. In 1995 these are shown in the following order:

- desertification of rural areas,
- Overexploitation of raw materials,
- excess of energy consumption,
- radioactive contamination and
- freshwater becoming contaminated

as opposed to those from the 2000 sample group:

- overexploitation of raw materials,
- seas becoming contaminated,
- excess energy consumption,
- radioactive contamination and
- freshwater becoming contaminated

It should be pointed out that the only difference between the samples is that “desertification of rural areas” is considered as one of the important problems for the students in 1995 (25.39%, sixth place) whereas it is considered as less important in 2000 (18.70%, twelfth place).

It is also interesting to note that among those subjects which were less selected, apart from those which are more related to social organization, were those themes mainly related to how the subsoil is used, either by contamination or by agricultural or urban abusive uses, which were apparently not associated with desertification in 1995.

Extra-academic activities

This part of the questionnaire intends to learn about the students from an environmental awareness point of view, and also as an approach to their lifestyles. The first of the questions centred on this purpose was "the extra-professional activities you enjoy" which encourages the person interviewed to point out the three activities they enjoy most from a list. Both sample groups showed that roughly half the students practiced some form of sport in their spare time. Almost half of them go to the cinema as spectators and enjoy gathering to discuss subjects or going to the discotheque with their friends.

Within the activities that are related to environmental concerns, approximately a quarter of the students enjoy hiking in nature areas, although only 6.84% of these belong to ecological or excursion associations in 1995, and only 5.56% of them did in the year 2000. Finally, watching sports and playing a musical instrument also stand out.

Being a member of an institutionalised association is a minority with regard to the “affiliation” of being in a group of friends, and although being a member of an organization is significantly present in both sample groups, a reduction has been seen from 1995 to 2000, as shown below:

- religious activities: from 8.62% in 1995 to 5.94% in 2000,
- NGOs: reduced from 4.86% to 3.88% between the two same years.
- Ecological or excursion associations went down from 6.84% to 5.56% over the same period.

Finally, with hardly any incidence, being a member of a political association is also present in both sample groups.

A comparative between universities of the Valencian Community with the rest of the universities

A major difference stands out between the universities outside and inside the Valencian Community. This is seen in the association of "the quality of human life" with the environmental conception: 28.52% of the non Valencian students as opposed to 6.23% of the Valencian students.

Likewise, it is interesting to check that in both cases, and in the same way as in the previous comparison, the Third World situation, urban surface or food quality are the items which were selected less, meaning that the so-called social character (red coloured) is last. This details leads to an understanding that such terms are not considered to form part of the natural environment.

Sense of crisis and feelings towards the most important environmental threats

The most greatly perceived threat in both cases is that of the natural resources being destroyed by mankind itself. This is in keeping with the answer to the first group of question. The following points are a great cause of concern among 40% and 50% of those questioned: environmental problems affecting the atmosphere, pollution, global warming and the collapsing ozone layer, and almost on the same level, excess waste production.

Between 20% and 26% of the sample groups respectively select the items that refer to marine contamination, lack of raw materials, excess of energy consumption, radioactive contamination and overexploiting surfaces for urban requirements.

Between 10% and 20% of students from both sample groups emphasize the threats that the following mean: desertification, freshwater becoming and subsoils becoming contaminated, wars, general life quality and noise pollution. At a similar level, around 10% of the answers touch on problems which include food poisoning in a highly technological society. Items referring to the overexploitation of agricultural areas, famine, social conflicts, shanty town problems and public order in urban areas obtain less than 10% of the answers.

This response is probably coherent with the global information concerning ecological terms in our society, and it may be for this reason that differences are not appreciated among the students from different geographical areas. However we should point out there is a certain ethnocentric matrix sensed. All the threats especially close to the natural environment of our own civilized regions stand out, whereas apparently we are less likely aware of the relation between the destruction of the natural environment in vast regions of the Third World and of other blights, such as war, famine, mankind or the poor human living

conditions produced by the ecological abuse of the environment to profit others. This abuse in turn causes a desperate exhaustion of resources for those people who could not survive any other way.

Extra-academic activities

Both sample groups reflect that their spare time is taken up by half the students going to the cinema as spectators, gathering with friends for discussions or going to the discotheque with their friends. Almost half practice some form of sport.

Within those activities related with the environment, about a quarter of the students enjoy hiking in nature areas (more students inside the Valencian Community than outside the Valencian Community), although only 5.09% are members of ecological or excursion organizations in Valencian universities and only 2.36% in other universities outside the Valencian Community. Finally, watching sports being played and playing a musical instrument should also be pointed out.

Institutionalised associate members are seen as a minority, and although they are featured, a lower participation in the sample groups is seen outside the Valencian Community, as the following items show:

- NGOs: 1.75% as opposed to 4.81%
- Ecological or excursion associations: 2.36% as opposed to 5.09%

A comparative between ETSICCyP with the rest of the colleges and faculties which form part of the UPV.

Environmental conception.

As in the rest of the analyses, both sample groups coincide in defining the natural environment as a group of natural resources with regard to human societies. There is a second response level, where between 40% and 30% of the answers are of an environmental defining characteristic type; atmosphere, virgin nature, plant subsoil and fauna, all related to natural resources. On a similar level and from a society interaction point of view, the human waste problem arises. Over 20% of the answers highlight flora, human life quality, nature reserves and the sea. The following themes appear among nearly 10% of the answers selected: urban spaces, freshwaters, food quality and urban surfaces, and the Third World situation is once again a minority option.

Sense of crisis

Feelings towards the most important environmental threats

Throughout the UPV, the greatest threat that is perceived is the destruction of natural resources by mankind, as according to the response from the first group of questions. There is also great concern, between 40% and 55%, towards the problems related to the climatic change problems and the exhaustion of the ozone layer, and excess waste production is almost on the same level.

Between approximately 20% and 27% select the items which refer to the lack of raw materials, the excess of energy consumption, seas becoming contaminated and the overexploitation of surfaces for urban requirements in both sample groups.

Between 10% and 20% of the students from both sample groups emphasize the threats that involve desertification, population explosion, freshwaters becoming contaminated, wars and general life quality.

On a similar level, almost 10% of the responses touch on problems involving food poisoning in a highly technological society. Less than 10% of the responses include items that refer to the overexploitation of agricultural areas, famine, and public order in urban surroundings.

These aspects described until now collect the points that are common between both sample groups, but there are notable differences between the feelings towards environmental threats of the ETSICCyP students with regard to the rest of the UPV students. These aspects are as follows:

ENVIRONMENT	PERCENTAGE & ORDER OF THE REST OF UPV		PERCENTAGE & ORDER OF ETSICCyP	
Noise pollution	52.38	2	9.26	18
Atmospheric pollution	22.23	8	44.37	3
Subsoil becoming contaminated	22.23	9	12.11	16
Social conflicts	10.49	15	4.02	21
Radioactive contamination	0.34	23	20.24	9

As the table shows, the ETSICCyP students consider that noise pollution, subsoil problems and social conflicts are a lot less important than the rest of the UPV students do, whereas exactly the opposite occurred when it came to atmospheric pollution and radioactive contamination.

3.1.2.1.Feelings towards more important environmental threats in the professional area (University)

The similarity in the answers of both sample groups is significant, specifically so as almost half the answers considered wasting paper, tobacco smoke in public places and the traffic to avoid in order to reach the university as main problems. Wasting energy, overheavy atmosphere in lecture rooms and overcrowding were aspects that obtained percentages below 40%.

These first items were followed by the lack of green belt areas and wasting water.

A list of problems derived from University activities themselves appeared, although the answer incidence was low, headed by the fear of radiation from computers, general cleaning problems and toilets, but also in the lecture rooms and tables, which some people are sensitive about.

3.1.3. Environmental self-esteem

The green area option is clearly the most valued in the three reference areas. The second ecological value option is that of nearby surroundings, which is slightly less valued than the University surroundings.

Neighbourhood relations are also valued, as are district and University relations in a similar measure in both sample groups. What was noticeably less valued were the city aspects, probably because life seems more impersonal outside ones own district.

The last of these items, this being the urban landscape, is one of the least valued items in both sample groups, both in the University as well as in the district, and it is placed relatively low down with a poor answer incidence within the more extensive geographical

context of the city. We must interpret this answer in a similar way to that regarding services and transports, that is, urban landscape from a city point of view is more acceptable than if observed from districts or from the campus.

3.1.4. Identification of personal tendencies

3.1.4.1. Extra-academic activities

Approximately half those questioned from both sample groups gather for discussions, go to the discotheque with friends, practice some form of sport or go to the cinema as spectators.

Within the activities that are related to natural environmental concerns, around a quarter enjoy trips to nature areas, although only 3.88% of the ETSICCyP students belong to ecological or excursion associations and only 3.72% of the rest of the UPV students do. Finally, playing a musical instrument or watching some form of sport should be pointed out.

Institutionalised association membership is a minority with similar results in both sample groups, and political party activities remain as the least frequent activity.

3.1.4.2. Time spent on extra-academic activities

The same order of priorities is set out in both analyses. Generally speaking, almost half the students spend one or two hours a week on their activities, which reveal notable levels of liking and perseverance.

Conclusions

1. CONCLUSIONS ABOUT THE TECHNIQUE APPLIED

- This is the first time such a study has been conducted.
- The questionnaire is a necessary and useful instrument to assess the effect of the students´ environmental training during the time they study at University. It is also an integrated part of the standardized Environmental Management Systems which are introduced in the University as an institution.

- **Conclusion 2**

Obtaining a methodology in order to follow up the university environmental policy results.

- **Conclusion 3**

Establishing how to introduce the preactive attitude, environmentally speaking

- **Conclusion 4**

Students are well informed about environmental issues, both through the general media as well as through specific technical information

- **Conclusion 5**

Readiness in collaborating is high although very centralized in reforestation themes. However certain contradiction is seen in answers, especially with regard to the irresponsibility of how we set out about our social and economic life in ecological terms, as we always expect the salvation to such problems will come through state formulae rather than from global changes orientated to our own habits, ideological compromises and lifestyles.

In this study we have found a population group which is widely sensitive to ecological themes, but at the same time it is blamed for its aggressive practices on the environment. The contradiction is solved by placing the responsibility on public organization from its lack of solutions to the problems set out. This most probably means that those policies that facilitate the feasibility of environmental protection will become a demand within this collective to political parties and public institutions over the next few years.

What we can also conclude from this study is that the role the media play in the population becoming sensitive to ecological issues is significant. The environmental problems excluded by the informative policy of this media also go unnoticed by our students. On the other hand, those problems which occupy the students´ concerns most are also those themes that have captured their interest more from the media itself.

These results are coherent with the Spanish ecological awareness, which is more concerned about consolidating quantitative levels of economic development than reflecting more on the consequences that this process will have in the long term.

References

- Alessa, L., Bennett, S. and Kliskey, A. (2003) Effects of Knowledge, personal attribution and perception of ecosystem health on depreciative behaviors in the intertidal zone of Pacific Rim National Park and Reserve. Journal of Environmental Management 68, Issue 2 (2003) 207-218.

- Blomquist, G., Newsome, M., Stone, B. (2003) Measuring principals´ values for environmental budget mamagement: an exploratory study. Journal of Environmental Management 68(2003)83-93.

- Cabreras, M. y García, E. (1993) Ciutat, camp y natura: Medi Ambient i conflicto social a l´àrea metropolitana de Valencia IVEI, Valencia.

- CEE (2001) Reglamento (CEE) Nº 761/2001 del Parlamento Europeo y del Consejo de 19 de marzo de 2001, por el que se permite que las organizaciones se adhieran con carácter voluntario a un sistema comunitario de gestión y auditoría medioambiental (EMAS)

- CIS (1996) “Ecología y medio ambiente” *Datos de opinión,* 6, pp.3-10

- CIS (1999) “Opiniones sobre el medio ambiente en Europa” *Datos de opinión*, 20, pp.9.12.

- CIS (1999) “Del medio ambiente:el ruido” *Datos de opinión*, 21, pp 3-5

- CIRES (1994) La realidad social en España. 1992-93 (Cap. 3 Ecología y medio Ambiente). Ediciones B, Madrid.

- CIRES (1996) Encuesta dedicada a la sensibilidad medioambiental

- Comisión européenne (2002) L´environnement? Ce que les Européens en pensent. Principaux résultats des sondages effectués en 2002 dans le cadre des enquêtes EUROBAROMETRE 58.0 et EUROBAROMETRE 123. Luxembourg, Office des publications officielles des Communautés européennes. ISBN 92-894-4779-6

- Diez Nicolás J. y Inglehart R. (coord.) (1994) “Tendencias mundiales de cambio en los valores sociales y políticos”, Fundesco, Madrid

- Garcia E. (2002) “Desenvolupament i sostenibilitat al País Valencia” *Arxius*, 7, pp.173-197

- García Ferrando, M. (1991) Opinión pública y medio ambiente. Sistema, 104-105,pp. 175-189.

- García Ferrando M. y Ariño A.(1998) “Los nuevos valores de los valencianos”, Fundación Bancaja, Valencia.

- Gómez, C. y Paniagua, A. (1996) Caracterización sociodemográfica de la sensibilidad ambiental en España ICE,751, pp. 128-147.

- Inglehart R. (1977) “The silent revolution”, Princeton Univ. Press, Princeton.

- Myatt, L.B., Scrimshaw, M.D., Lester, J.N.(2003) Public perceptions and attitudes toward a forthcoming managed realignment scheme: Freiston Shore, Lincolnshire, UK. Ocean& Coastal Management 46 (2003) 565-582.

- Ley Orgánica de Universidades. Art31 y 32

- Peris Mora, E.; Montesinos, A.; Palop, F. (1999). El alumnado de la Universidad Politécnica de Valencia y el Medio Ambiente. Estudio de opinión. En M. Pardo: “Sociología y Medio Ambiente, Estado de la Cuestión. ISBN 84-921242-7-x

- Peris Mora, E., Martí, C., Capilla, C. y Palop, F. (2001) VII Congreso español de sociología en Salamanca 2001.

- Peris Mora, E (2000) Gestión ambiental en la Universidad. Ed. Tetragrama. ISBN 84-88523-75-0

- Peris Mora, E. y colaboradores (2002) Sistemas de Gestión Ambiental en la Ingeniería Civil. Escuela Técnica Superior de Ingenieros de Caminos, Canales y Puertos de la Universidad Politécnica de Valencia. ISBN84-699-8191-9.

- Peris Mora, E. (2002) Conferencia EMSU.

- UNE-EN-ISO 14001 Sistemas de Gestión Medioambiental. Oct. 1996

- UNESCO (1983)Trenes in Environmental Education since the Tbilisi Conference. Programa Internacional de Educación ambiental UNESCO-PNUMA.

- Holt, D., Homewood, S. And Kirby, D. (1997) Greening a Business School Curriculum in practice and principle al Middlesex University. The TEXT Consortium 1997 Annual Conference. Universidad Politécnica de Valencia. España.

- Rodgers, Ch. (1997) Green Eduaction through Greening Education. The TEXT Consortium 1997 Annual Conference. Universidad Politécnica de Valencia. España.

- Rosennorn, T. (1997) Environmental protection as a Tepic in Higher Eduaction in Denmark: a case study. The TEXT Consortium 1997 Annual Conference. Universidad Politécnica de Valencia. España.

- Van Volsen, S., Vens, V. and Hens, L. (1997) A case Study: the Green School Project in Flanders. In: Schools, Universities and the Environment. International Seminar on Environmental Care an Environmental Management Systems in School and Universities (47-54). Brussels.

- Zannin, P., Calixto, A., Diniz, F. And Ferreira, J. (2003) A survey of urban noise annoyance in a large Brazilian city: the importance of a subjetive analysis in conjuncion with an objetive analysis. Environmental Impact Assessment Review 23 (2003) 245-255.