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# 10 Ecological Modernization and Environmental Education: The Case of Turkey

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## 10.1 Introduction

Educational institutions are recognized as suitable venues to provide environmental awareness through their various programmes (Shin, 2000). Based on the Tbilisi Conference on Environmental Education in 1977, the main objectives of environmental education are awareness, knowledge, attitudes, skills and participation (<http://www.gdrc.org/uem/ee/tbilisi.html>). Overall, environmental education provides valid information for understanding the biophysical environment, creating motivation and guiding the discovery of suitable solutions to biophysical environmental problems. It is also involved, and plays an effective role, in environmental movements as a social and political culture (Hajer, 1996; Potter, 2010). Eventually,

Those now being educated will have to do what the present generation has been unable or unwilling to do: stabilize world population, reduce the emission of greenhouse gases that threaten to change the climate ... protect biological diversity, reverse the destruction of forests everywhere, and conserve soils.

(Orr, 1996, p. 7)

An environmental issue, as a challenge for the 21st century, is a foregone conclusion; therefore, its inclusion in the curriculum of tourism education has been stressed and recognized as an essential part of the tourism curriculum (Fidgeon, 2010). It has been realized that training and education enhances environmental awareness regarding the negative and positive impacts of tourism, which leads to a pro-environmental attitude and behaviour among stakeholders, i.e. tourists, the host community, the commercial sector and the government (Ballantyne *et al.*, 2011).

In keeping with the above narrative, which discursively outlines the role of education, this study focuses on the role of the university as an institutional platform for environmental

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education and which has obvious components that legitimize institutional transformation (Mol, 2002; Choy and Lau, 2013).

However, overcoming these challenges cannot be perceived as a magic wand. In order to achieve environmentally and socially acceptable tourism models, it is essential for educational institutions to embark upon transforming market value led behaviour and environmentally laissez-faire attitudes towards more environmentally – and social value driven – responsible tourism (Mihalic, 2014). Therefore, education will play a catalytic role in imbedding environmental values among students, who will be apt to take strategic actions in implementing environmental policies for the betterment of their firms and local population.

## 10.2 Literature Review

As a backdrop to this study, the theory of ecological modernization (TEM) is initiated as a discourse in response to ecological problems; this is because sustainable development, notwithstanding its grand goals, is perceived as vague and difficult to operationalize (Eder, 1996). This is not, however, meant to undermine the credibility of the sustainable development paradigm. In fact, it has been a major force in the transformation of environmentalism into the ecological discourse that is TEM (Hajer, 1996; Giddens, 1998). Such a transformation, Giddens (1998) noted, is reflected in the fact that the ‘countries most influenced by the idea of ecological modernization are the cleanest and greenest of the industrial nations’. In Eder’s (1996, p. 210) words, ‘Its transformation into a new ideological master frame provides the possibility of a way out, legitimating social institutions by means of environment-related ethical frames.’

The paradigmatic structure of TEM is rooted in a process of production and consumption (i.e. the decoupling or delinking of material flows from economic flows) and institutional transformation, especially in the public sphere (Eder, 1996; Mol, 2002). The crux of the theory was initially established when:

The social dynamics behind these changes that are the emergence of actual environment-induced transformations of institutions and social practices in industrialized societies are encapsulated in the ecological modernization theory. This theory tries to understand, interpret and conceptualize the nature, extent and dynamics of this transformation process.

(Mol, 2002, p. 93)

However, TEM is not employed solely to justify shifting the institutional structures of solid waste management and improving its system in Malaysia (Saat, 2013), or reforming the planning system in Australia’s island state (Castles and Stratford, 2014); the focus of our study is the institutional transformation of the educational entities, universities, in the context of TEM. Four constructs of transformation are targeted by the TEM school of thought through environmental education and green education policy.

The core hypothesis of TEM is that ‘production processes are increasingly designed and conducted using ecological criteria’ (Mol and Sonnenfeld, 2000, p. 9). Therefore, we can also assume that *universities, as the bastion of educational institutions, have the potential to transform the attitude and behavior of the students (i.e. consumers) towards ecocentricism knowing the fact that they are fixated on anthropocentricism.*

Therefore, as institutions of science and knowledge, universities need to move towards greening the curriculum on the one hand and encouraging environmentally oriented extracurricular activities on the other. In the context of TEM, educational institutions need to revise the politics of knowledge and its dissemination to their consumers (students). In Grove-White's words, 'If we are to produce accounts of environmental problems that are sensitive to culture and indeterminacy, we will need different institutions, and different knowledge cultures' (as cited in Beck, 1996, p. 26). Such a culture is nothing other than environmentalism, and it will not become a mediator of environmental attitude/behaviour unless there is a clear institutional policy change towards long-term, policy-useful knowledge regarding environmental issues. Focusing on tourism education, the above argument is converging with a 'knowledge-based platform' 'which is characterized by a preference for objective, scientific methods to obtain knowledge about the tourism industry, and by the concomitant rejection of simplistic judgments regarding the nature of mass and alternative tourism' (Weaver and Lawton, 1999, p. 15).

Nevertheless, this school of thought has transcended Western economies and has grown into an intellectual stock that becomes more heterodox as its scope and influence expands. In Giddens's words, 'Ecological modernization implies a partnership in which governments, businesses, moderate environmentalists, and scientists cooperate in the restructuring of the capitalist political economy along more environmentally defensible lines' (Giddens, 1998, p. 57). This is clearly reflected and realized by Beck (1996) within the context of the *risk society*.

### 10.2.1 Environmental attitude/behaviour and education nexus

Numerous theoretical frameworks have been used in an effort to elaborate and explain the factors that result in the development of an attitude that will eventually generate the behaviour required for certain environmental actions. Among those factors, education, knowledge and awareness have been discussed extensively as influential variables in displaying pro-environmental behaviour (Ivy *et al.*, 1998; Kollmuss and Agyeman, 2002; Thapa, 2010; Kuo and Jackson, 2014). As Lozano *et al.* (2013) emphasize on the role of the university as a better leader in the initiation of sustainable development, the university system needs to restructure through including environment and development issues in the curricula, research, physical plant operations, outreach and engagement with stakeholders, and in assessment and reporting.

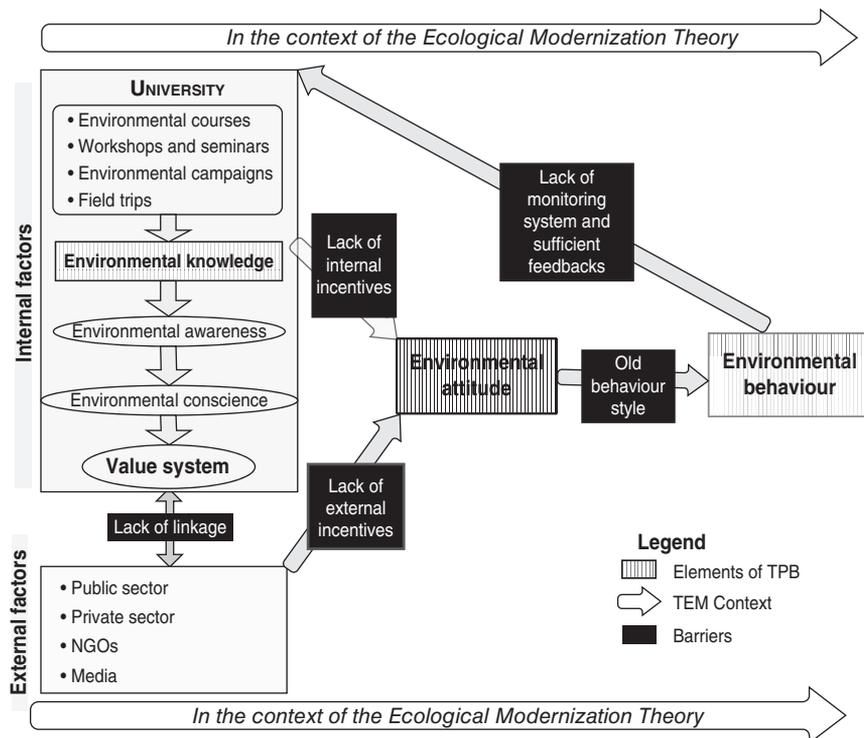
In this study, an attempt has been made to place the aforementioned factors and the role of the university within the context of TEM by emphasizing the university's curriculum and students' environmental awareness. The overarching concept is that the aforementioned independent factors will eventually lead to the development of a responsible attitude and behaviour towards the environment. TEM's call for institutional transformation (i.e. the greening of universities) is considered a shift away from and revision of the traditional curriculum; environmental education becomes a transformation from rhetoric to reality. As Beck stated, 'The constellations of risk society are created because the self-evident truths of industrial society (the consensus on progress, the abstraction from ecological consequences and hazards) dominate the thinking and behavior of human beings and institutions' (Beck, 1996, p. 28).

In this study, efforts were made to examine the case of the Eastern Mediterranean University (EMU) and its quest to disseminate environmentalism among its consumers in the context of what Stevenson eloquently explained:

The need for students to engage in ideological and critical inquiry is indicated by an examination of the different ideologies which underlie proposals for environmental reform. Such educational ideals, however, conflict with the dominant practices in schools, which emphasize the passive assimilation and reproduction of simplistic factual knowledge and an unproblematic 'truth'.

(Stevenson, 2007, pp. 139–140)

This is the first study in which TEM has been used to justify the role of the university as an institution in the process of transformation and to monitor its performance in the context of the theory of planned behaviour (TPB) through the measurement of the knowledge, attitude and behaviour of students in different fields of study and at varying educational levels. This means that we provide a mechanism that demonstrates how educational institutions should function parallel to EM principles and assess the operation of encouraging pro-environmental behaviour based on internal (knowledge, value, conscience) and external (non-educational institutions) factors. In other words, while EM sets the context, TPB becomes instrumental in the validation of the environmental knowledge/attitude/behaviour nexus (Fig. 10.1).



**Fig. 10.1.** Environmental education model (adapted based on TPB and TEM).

Notes: TPB = theory of planned behaviour (Ajzen and Fishbein, 1980); TEM = theory of ecological modernization (Hajer, 1996).

Recently, TPB has been employed to support the linkage between attitude and environmental behaviour in various disciplines such as agriculture and ecology (Price and Leviston, 2014; Sulemana and James, 2014), business and marketing (Kalamas *et al.*, 2014), energy (Stigka *et al.*, 2014), hospitality (Chou, 2014), psychology (Sparks *et al.*, 2014) and education (Yasunaga *et al.*, 2014). In a recent study conducted by Gifford and Nilsson, knowledge and education were considered influential factors towards creating pro-environmental behaviour. In their words 'one is unlikely to knowingly be concerned about the environment or deliberately act in pro-environmental ways if one knows nothing about the problem or potential positive actions' (Gifford and Nilsson, 2014, p. 142).

As exhibited in Fig. 10.1, a model has been developed to provide a framework for this case study. As previously mentioned, the structure of the model is framed based on TEM and TPB. Two sets of variables/factors are identified as the machinery that is fundamental for setting the process in motion.

The first set consists of internal factors, which fall within the domain of the university, where different modules (environmental courses, workshops and seminars, environmental campaigns, field trips, etc.) will channel environmental knowledge, awareness and consciousness. This process will most likely result in an environmental value system among the students in regard to their attitude and behaviours (i.e. based on TPB) (Ajzen and Fishbein, 1980; Montano and Kasprzyk, 2008; Gifford and Nilsson 2014). The *environmental knowledge construct* is highlighted as it encompasses all other modules.

The second set is composed of external factors, with an emphasis on the degree of linkages to internal factors. External factors are those that fall outside the university's sphere; however, they have an active and dynamic link to internal factors as public institutional spheres (e.g. the Ministry of Education). Consequently, the public institutions' policy change towards environmentalism is emphasized as structural (based on TEM) (Choy and Lau, 2013). Therefore, the strength of such a link, based on a partnership framework, is essential in the shift towards greening educational institutions (i.e. institutional policy transformation). In addition, external factors also encompass the private sector, non-governmental organizations (NGOs) and the media. Their role as partners in the process of transformation cannot be overemphasized.

The model also refers to the barriers to the process of transforming environmental behaviour. These barriers are a manifestation of the difficulties that are inevitably associated with change. Perhaps, in the context of EM, the nature of such change can be understood as follows: 'Consistent with democratic principles, students should be exposed to the plurality of environmental ideologies, and...through a process of inquiry, critique and reflection, they can be assisted to develop and defend their own set of environmental beliefs and values' (Stevenson, 2007, p. 143).

The Eastern Mediterranean University was established in 1979 as a technical college in the newly independent economy known as the Turkish Republic of North Cyprus (TRNC). The university has become an educational hub for international students, mainly from the Middle East, Central Asia, Africa and the Far East. EMU is the largest university on the island of Cyprus. At present, it has a student body of over 16,000, and this figure is increasing. The university has awarded 41 international accreditations, recognitions and memberships by international organizations (<http://ww1.emu.edu.tr/en/about-emu/memberships-and-accreditations/c/597>).

### 10.3 Methodology

The assumption that frames the conceptual/discursive nature of this study lies in TEM, which is justified because it has become instrumental and is the focus of analysis for recognition of the legitimacy of change in the public sphere towards the ecological system. The proponents of TEM believe that this is possible through institutional transformation in all spheres of society (Eder, 1996; Hajer, 1996; Orr, 1996; Giddens, 1998; Jackson and Roberts, 1999; Huber, 2000; Mol, 2002; Steurer and Hametner, 2013). Therefore, we have focused on the case of an educational institution, a university, to explore the nature of environmental education as a learning culture. Furthermore, we assume that environmental education in the form of the provision of knowledge can lead to the development of an attitude that will result in behaviour that favours environmentalism (i.e. contextualized based on TPB) (Ajzen, 1991; Montano and Kasprzyk, 2008; Ajzen and Sheikh, 2013).

Six hundred questionnaires were distributed among undergraduate- and graduate-level students majoring in different fields. For this purpose, an instrument of 51 items was designed and tested. The instrument was adapted from Ivy *et al.* (1998) and was used to measure secondary students' environmental knowledge. The 51 questions contained 16 items to measure students' environmental knowledge, 13 that targeted their attitudes towards environmental concerns and 13 that gauged their environmental behaviour (i.e. four items on their green consumerism and nine on their general environmental behaviour). The remaining nine items assessed EMU's environmentally relevant modules within the curricula. In order to reduce common method bias, one of the procedural remedies proposed by Podsakoff *et al.* (2012) was applied to provide respondent anonymity. Therefore, students were assured about the confidentiality of the information that they provided in the questionnaire.

A non-random method of convenience sampling was applied. However, in this study, the instruments were readjusted to measure EMU's role in the provision of environmental education through different modules within the curricula. Samples selected from students of different age, educational level, gender and study were filed. In total, 277 questionnaires were returned, of which 241 items were valid and usable. Thus, the response rate was 40%. An independent *t*-test used to check non-response bias. To ensure the clarity of the instruments, they were pilot tested on 20 respondents (12 undergraduates and 8 graduates) who were not included in the survey.

The pilot study result indicated that the questionnaire items were understandable and unambiguous. The reliability of the instruments was measured using Cronbach's alpha, and the reliability coefficients for three dimensions – environmental knowledge, attitude and behaviour – met the acceptable cut-off, indicating 0.61, 0.65 and 0.63, respectively (Cortina, 1993). Therefore, the results indicate the internal consistency of the measurement. For the purpose of descriptive and inferential statistical analysis, a *t*-test and a one-way analysis of variance (ANOVA) were applied. For the statistical analysis, SPSS (statistical package for social sciences) version 20 was utilized.

The majority of the students (78%) are between 18 and 27 years old, 19% of the students are 28–37 years old and the remainder (2.9%) are 38 years old and above. About 13% of the respondents study in a 2-year programme, 54% in a 4-year programme, 22% are in an MS programme and about 10% are PhD students. About 55% of the students are male and 44% are female. The major field of study of 60% of the students is in social sciences (tourism management). About 40% are majoring

in engineering fields including: industrial engineering, mechanical engineering, civil engineering and electrical and electronic engineering.

## 10.4 Results

To meet the objective of the study, the mean scores for the students' environmental knowledge through the attributes of land, air, water, noise and global issues have been calculated and are presented as a percentage in Table 10.1.

**Table 10.1.** Descriptive statistics of respondents' knowledge regarding environmental facts, concepts and global environmental issues.

Issues	Items	Answer options (%)				Don't know	Total (%)
		1	2	3	4		
Land	What is likely to be the most important worldwide source of energy for the future?	66.8*	4.6	7.9	12.9	7.9	55
	Which source of energy contributes the least to environmental problems?	48.1*	10.4	11.6	24.5	5.4	
Air	Which is a renewable resource?	8.7	10.8	9.5	49.8*	21.2	51
	What is the effect of burning coal and oil?	4.1	11.6	11.6	56.4*	16.2	
	What is the major air pollutant (by weight) discharged by motor vehicles?	39.4*	38.6	5.4	3.3	13.3	
	What are the major sources of air pollution in big cities?	7.9	7.9	73.0*	7.1	4.1	
	Why is carbon monoxide a serious air pollutant?	39.4*	32.8	11.6	6.2	10.0	
	What is the cause of the increase in carbon dioxide in the atmosphere?	46.9*	15.4	12.0	7.9	17.8	
Water	Which statement is true about air pollution?	29.9	10.8	9.5	39.0*	10.8	36
	What is the major source of oil pollution in the oceans?	25.7	36.5*	15.8	9.1	12.9	
Noise	Why are fish killed when waste is thrown into bodies of water?	27.4	10.4	13.7	32.0*	16.6	10
	What does not contribute to an increase in noise levels?	24.5	29.5	10.0*	24.5	11.6	
Global issues	What increases the acidity of rain?	15.4	18.3	13.3	25.7*	27.4	28
	What is the effect of deforestation?	5.8	24.9	10.0	41.1*	18.3	
	What caused the 'greenhouse effect'?	29.0*	17.0	12.0	16.2	25.7	
	Which statement about the ozone is not true?	16.2*	13.3	14.1	14.1	42.3	

Note: Correct answers indicated with an asterisk.

The mean scores for the environmental attitude and behaviour of students by field of study, gender and nationality (continent) were compared using the *t*-test (see Table 10.2).

The ANOVA was employed to compare mean scores of the environmental attitude and behaviour of the respondents, in the context of four modules (i.e. courses, workshops, trips and campaigns) within the curricula, towards the dissemination of environmental education (see Fig. 10.2).

#### 10.4.1 General environmental knowledge (Dimension 1)

The analysis of the respondents' knowledge regarding environmental facts and concepts, as well as global environmental issues (i.e. measured by 16 items), showed that 55% had an accurate knowledge of the specific issue of land-related environmental issues (measured by three items). The accuracy of their knowledge of air-related environmental issues was 51% (measured by six items). The respondents' knowledge of water-related environmental issues was 36% (measured by two items). However, the respondents' knowledge and information on the issue of noise was 10% (measured by one item). In relation to global environmental issues, respondents' knowledge was 28% (measured by four items) (refer to Table 10.1). Overall, the average scores of the respondents in relation to their awareness and knowledge of environmental issues was 36%. The results indicate that the general environmental knowledge and information of students at EMU is below average (36%). The consistency of our study is only similar to that conducted by Ivy *et al.* (1998) in terms of the knowledge of noise pollution as an environmental issue. In other cases, such as Blum (2008) and Richmond (1976), who measured the environmental knowledge and information of students in different countries, the result of our study is consistent with their findings. However, this is not the case when our results are compared with those of Ivy *et al.* (1998), who studied students from Singapore.

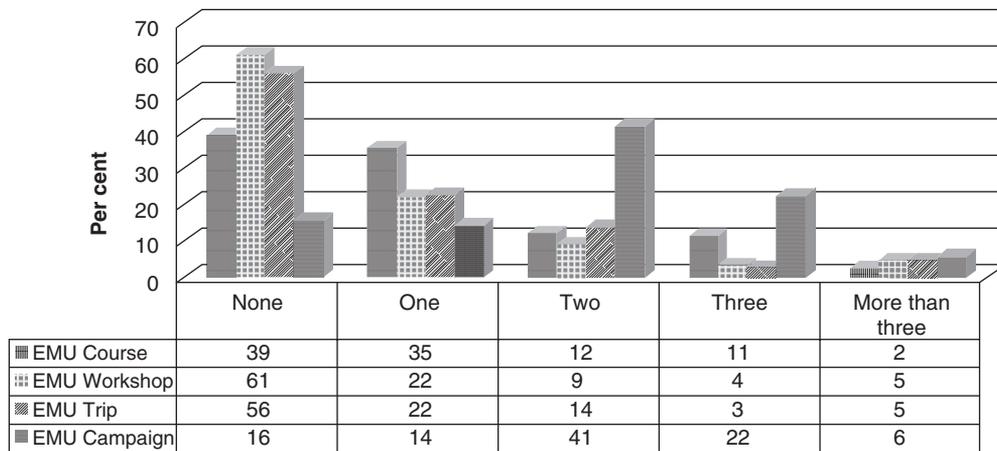
#### 10.4.2 Environmental attitude (Dimension 2)

Students' learned attitude precedes their behaviour where the latter is associated with taking action on an issue of concern – in this case, environmental concern. The idea of attitude towards a behaviour is theorized and explained by Fishbein and Ajzen (1975) and Azjen (1991) through the TPB. Based on TPB and its sister theory, the theory of reasoned action (TRA), which have been explored by numerous scholars (Glanz *et al.*, 2008), knowledge through education results in an attitude towards a behaviour/action with a certain issue as the target. Thus, being knowledgeable of the environment can possibly result in an individual taking positive action towards the environment. One's attitude towards the environment is consequently a learned process, and it is the responsibility of educational institutions to generate such an attitude in students, who are the future scientists, policy makers, consumers and voters (Chaineux and Charlier, 1999). The composite scores of the 13 items that were allocated to measure students' environmental attitudes were computed, and the results indicated that the average respondent's attitude was 3.15 (SD = 0.55) out of 5, which was the highest scale. The average score of students' environmental behaviour was relatively low ( $M = 2.86$ ,  $SD = 0.44$ ). The percentage rate of environmental knowledge

**Table 10.2.** Compared mean of environmental attitude and behaviour of respondents with different major, gender and continent of origin.

Mean comparisons Variables	Field of study						Gender						Students' origin					
	Engineering		Tourism		Male		Female		African		Asian		Mean		SD		t-test	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	t-test	t-test
Environmental attitude	3.04	0.52	3.22	0.50	3.15	0.52	3.15	0.49	3.13	0.50	3.15	0.52	3.15	0.52	3.15	0.52	0.002 <sup>(ns)</sup>	-0.26 <sup>(s)</sup>
Environmental behaviour	2.86	0.46	2.86	0.44	2.89	0.44	2.81	0.44	2.85	0.44	2.86	0.44	2.86	0.44	2.86	0.44	1.28 <sup>(ns)</sup>	-0.26 <sup>(ns)</sup>

Notes: \*Significant at 0.01 level; ns = not significant.



**Fig. 10.2.** Level of environmental activities of the EMU in line with TEM.

that was obtained based on correct answers (through the Likert scale), showed a mean value of 1.8, which was very low (refer to Table 10.2). The results are in accord with the theoretical framework presented, which demonstrates that a low level of knowledge will possibly lead to poor environmental attitude and behaviour. This finding is in line with the study conducted by Monroe *et al.* (2013), where a positive correlation between environmental knowledge and attitudes/behaviour is demonstrated.

#### 10.4.3 Environmental behaviour (Dimension 3)

This dimension was measured by 13 items in two categories, where the mean attitude and behaviour scores with standard deviation for engineering and tourism students were illustrated. In addition, the mean and standard deviation scores based on gender and nationality (continent) were shown (Table 10.2). The results of the *t*-test for the mean comparison of two groups of students revealed a significant difference between the environmental attitudes of engineering and tourism students ( $t = -2.65, p < 0.01$ ). The environmental attitude of the tourism students ( $M = 3.22, SD = 0.50$ ) is stronger than that of the engineering students ( $M = 3.04, SD = 0.52$ ). However, the mean scores for the environmental behaviour of engineering and tourism students are not significantly different ( $t = -0.02, ns$ ). The environmental attitude and behaviour of male and female students is not statistically different. A comparison of the environmental attitude and behaviour of African and Asian students revealed no significant differences between the two groups ( $t(241) = -0.26, ns$ ) (refer to Table 10.2).

#### 10.4.4 EMU's environmentally relevant modules/curricula (Dimension 4)

This dimension focuses on EMU's environmentally oriented modules and activities, as part of its curricula, with the aim of assessing the extent of the university's

efforts towards the dissemination of environmental knowledge/awareness among the students. An ANOVA test was conducted to compare the means of the educational level of the students in regard to environmental attitude and behaviour. The analysis revealed no significant differences in the environmental attitude ( $F(3,241) = 0.54$ , ns) and behaviour ( $F(3,241) = 1.2$ , ns) of the students through four means of educational modules (i.e. courses, workshops, field trips and campaigns). Furthermore, no significant differences exist among the various levels of schooling, including 2-year programmes, 4-year programmes, master programmes and doctoral programmes.

As depicted in Fig. 10.2, 39% of the respondents claimed that they had taken no environmentally related/relevant modules, 59% stated that they had never participated in any workshop on environmental issues and 54% responded that they had never participated in any field trip for environmentally oriented educational purposes. Fifteen per cent of the students had never participated in any campaign related to an environmental issue. As depicted in the last column of Fig. 10.2, only 2% of the students had taken more than three environmentally oriented courses, 5% had attended more than three workshops, 5% had taken more than three field trips and 6% had taken part in campaigning for environmental purposes.

What is revealed through this dimension has profound implications for attitude and behaviour, as knowledge and attitude are considered antecedents of behaviour towards environmental actions (i.e. based on TPB) (Ajzen, 1985; Montano and Kasprzyk, 2008). Finally, yet importantly, the EM school of thought has been instrumental in environmental capacity building in various institutions around the world, and this has positive implications. It is time for transitional economies, such as north Cyprus, to embark on university and public sector partnerships geared towards what Weidner (2002) called the 'ecologicalization' of institutions and organizations in various social systems (and scientific disciplines), which is progressing slowly in the developing nations. It is hoped that this will pave the way to sustainable development.

Consonant with other empirical studies (Hartline *et al.*, 2000; Lindner *et al.*, 2001), an independent sample *t*-test was employed to check a non-response bias. Respondents were grouped as early and late respondents. The two groups were compared on their responses to the question items using a *t*-test. No apparent significant differences were found between the responses of early (i.e. 170 cases) and late (i.e. 70 cases) respondents; therefore, the results are generalizable to the target population. This is one of the highly used methods for controlling a non-response error in survey research (Lindner *et al.*, 2001). Based on the results of an independent test ( $p < 0.01$ ), a non-response bias did not emerge in the data.

## 10.5 Conclusion

Notwithstanding the growth of environmentally oriented curricula in the past few decades, along with the establishment of environmentally relevant fields (Palmberg and Kuru, 2000; Shin, 2000), the following question remains: To what extent is environmental education deliberately designed to instil environmentalism behaviour in students?

The first major purpose of the present study was to test the degree of dissemination of environmental knowledge/education in the case of EMU. The second was to gauge the students' environmental awareness. For this purpose, the EM paradigm and TPB have been instrumental in advancing understanding of the role of the university's curricula towards environmentalism in the context of EM. The results revealed the extent of the university's efforts in this regard, as well as the students' environmental inclinations. It also contributed to the notion that, in the developed countries, through organizational/institutional differentiation/integration, capacity building has been elevated within the context of environmental modernization in science, culture, politics, economics and civil society by specializing in environmental matters where training and education play a decisive role (Weidner, 2002).

As an underpinning framework for this study, the convergence between TPB and EM is modelled (Fig. 10.1), and the dissemination of knowledge through educational institutions becomes fundamental to changing behavioural patterns towards environmental concerns. As the environmental crisis intensifies, it is becoming increasingly clear that addressing it requires a radical change in human behavioural patterns.

This study has presented a provisional approach to the effectiveness of the EM theory on educational institutions' dissemination of knowledge and the awareness of how best to safeguard the environment. The outcomes of such knowledge and awareness, as contextualized in TPB (Ajzen and Sheikh, 2013), will result in the generation of attitudes/behaviours among students geared towards upholding environmental values. As Stevenson (2007, p. 143) stated, 'Students should be exposed to the plurality of environmental ideologies, and...through a process of inquiry, critique and reflection, they can be assisted to develop and defend their own set of environmental beliefs and values'.

The study revealed that students at EMU scored poorly regarding their overall knowledge and awareness of environmental issues (47.3%). This is an indication of their lack of exposure to the subject in question. The students' responses to the issues of land, air, water, noise and globally related environmental issues scored 55, 51, 36, 10 and 28, respectively. This indicates that students, either prior to or during their attendance at EMU, have not developed adequate knowledge of the subject.

The findings indicate that the EM call for institutional policy change (i.e. curricular reform) in inspiring environmental valuation among students as future policy makers, planners, managers and consumers has fallen on deaf ears. Therefore, EMU has remained aloof to the EM theory as a school of thought that 'not only...contributes to environmental social sciences and policy, but also strengthen[s] the linkages between those trans-disciplinary pursuits and mainstream social science' (Mol and Sonnenfeld, 2000; Ismaili *et al.*, 2014). The study has also revealed the inadequacy of EMU's environmentally oriented curricula regarding four dimensions: courses/modules, workshops/seminars, field trips and campaigns.

As depicted in Fig. 10.2, students' exposure and involvement in regard to these dimensions have remained minimal. This picture contradicts the principles of TPB – that is, that attitude and behaviour towards an issue are dependent on knowledge and information that is gained prior to commitment to the issue in question (Montano and Kasprzyk, 2008).

The results of the present study reveal that TEM and TPB are adequate frameworks for understanding and explaining the deficient environmental capacity building among students in an educational institution. Overall, these findings highlight the fact that the basic curriculum structure at EMU has ignored the validity of environmental education as the catalyst for future environmental behaviour.

Various scholars have discussed and analysed the role of educational institutions in instilling environmental awareness geared towards commitment to environmental sustainability among students enrolled in universities, colleges and primary/secondary education (Kollmuss and Agyeman, 2002; Rickinson, 2001). However, this study has contributed to the role of educational institutions by focusing on the modules/means that are essential for the construction of attitude/behaviour among students for the purpose of encouraging their environmental commitment in the future.

Environmental knowledge and awareness modules are considered as the policy imperatives that are associated with the public sector, as well as educational institutions' approach to generating positive environmental behaviour (Lozano *et al.*, 2013). Such environmental behaviour among students can be placed on a continuum. At one end, the worst case scenario of environmentalism, known as *anthropocentricity*, is the dominant behaviour. This is the behavioural state when students remain apathetic to their environs. At the opposite end, the ideal case scenario of environmentalism, known as *ecocentricity*, is dominant. This is the behavioural state when students graduate with compassion towards the environment (Baker, 2006).

This research is a cross-sectional study, which can be considered a limitation; however, we suggest further studies that adopt a longitudinal approach through a follow-up of students' environmental performance after graduation. Another idealistic suggestion for further research is to track the performance of the current students in their later working lives to identify the effect of the environmental knowledge injected into them by the university. However, as the current study has considered several factors out of the 18 social and personal factors that influence pro-environmental concern and behaviour noted by Gifford and Nilsson (2014), it is suggested that future research should measure all factors, in order to provide a more comprehensive view of the environment and education nexus. Another recommendation is to explore the performance of institutions (other than universities), as policy changes need to be made in the process of transformation towards EM.

Some of the implications of so-called 'greening' EMU's curriculum can be highly effective for tourism students based on the role they will take in their environmental agenda in the future. According to the classic meta-analysis of Hines *et al.*, knowledge and education are underlined as the two strongest predictors of responsible environmental behaviour (as cited in Gifford and Nilsson, 2014).

The findings of the study revealed that students in general lacked environmental knowledge and awareness, which encompassed students of tourism as well. Such discouraging levels of knowledge about issues of climate change, energy production and pollution will hamper making pro-environmental choices as an essential embryonic environmental greening towards sustainable tourism development. In fact, mass tourism, with all the critique of its negative environmental impact, is going to stay; however, environmental education in the context of a knowledge-based platform and

concurrent with TEM is an initiative to accommodate a more complex and ambiguous array of sustainability options within the tourism industry (Weaver and Lawton, 1999).

This study should be considered a wake-up call for tourism educators at EMU that social equity, justice, ethics and environmentalism are values that demand their rightful place in the tourism curriculum. In the context of a knowledge-based platform and ecological modernization's call for institutional policy change, the present curriculum has remained short of an appreciation of the structural complexity and international nature of tourism as a socio-economic, political and environmental phenomenon.

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