A Discourse on the Ecological Modernization Approach to Environmental Education: The Case of Eastern Mediterranean University

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ABSTRACT

The aim of this paper is to explore the role of educational institutions (i.e., at the university level) in the dissemination of environmental awareness, among the students, as a catalyst to future environmental convictions (i.e., environmental stewardship, natural resource management, public policy, and the awareness of the environment's intrinsic values). This study's theoretical grounding is ecological modernization theory and the theory of planned behavior. A survey was administered to students at Eastern Mediterranean University (EMU), in North Cyprus, to assess the scope of environmentally related education (i.e., modules, workshops, seminars, field trips, etc.) as well as the students' general knowledge of environmental issues. The study revealed that EMU's environmentally focused education is not adequate and that students' environmental awareness is minimal.

KEYWORDS: Ecological modernization, environmental education, environmental behavior, Eastern Mediterranean University, North Cyprus

INTRODUCTION

"The late 1960s saw the beginning of an intense debate on the societal consequences of environmental disruption and resource depletion. A considerable number of social scientists took the view that the existing institutional system was unable to prevent the emergence of ecological crises." [1, p. 1340]

Educational institutions are recognized as suitable venues to provide environmental awareness by means of their various programs [2, 3]. With reference to 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 [4]. 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 [5, p. 7].

In keeping with the above narrative, which outlines the role of education, this study focuses on the role of the university as an institutional platform for environmental education and that has obvious components that legitimize institutional transformation [6 7, 8] The components of environmental education are the following:

1. Awareness and sensitivity to the environment and environmental challenges
2. Knowledge and understanding of the environment and environmental challenges
3. Attitudes of concern for the environment and motivation to improve or maintain environmental quality
4. Skills to identify and help resolve environmental challenges
5. Participation in activities that lead to the resolution of environmental challenges (http://www.gdrc.org/uem/ee/1-1.html).

By considering whereby educational institutions as the organizations responsible for dissemination of knowledge and awareness, which 'environment' is only one of the subjects within the curriculum, then it is the responsibility of these organizations to perform the function of providing relevant knowledge in this field. In this regard, Mansour et al [9, p. 92] stated that 'Organizational Learning defined as the process of developing and applying new knowledge

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that has the potential to change staff's [student's] behavior. It will lead the organization to achieve improved results, ensures adaptability to cope with change, grow through innovation and create result-oriented employees'.

CONCEPTUALIZATION

As a backdrop to this study, ecological modernization (EM) 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 [10, 11]. Some have gone a step further and have labeled it an oxymoron [12]. 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 EM [13, 14]. Such a transformation, Giddens [14] 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 [10, 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."

EM has captured the attention of numerous scholars around the world, Mostly so in Western Europe (especially, Germany, the Netherlands, the UK, Denmark, and Sweden), the United States, and, more recently, in the newly industrialized countries where the concept has been molded into an epistemological/paradigmatic framework [13, 15, 16]. In fact, "Joseph Huber (from Germany) should be acknowledged as the father of ecological modernization theory due to his theoretical contributions to the environment and society debate from the 1980s onward" [17, p. 2].

Nevertheless, the paradigmatic structure of EM 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 [8, 10]. 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. [8, p. 93].

For example, EM was employed to justify shifting the institutional structures of solid waste management and improving its system in Malaysia [18] or reforming the planning system in Australia's island-state [19]. The focus of our study is the institutional transformation of the educational entities such as universities in the context of EM are four constructs of transformation which are targeted by the EM school of thought through environmental education and green education policy. These constructs are as follows:

1. Transformations in the role of the nation-state,
2. Modifications in the position, role and ideology of social movements,
3. Changing discursive practices and emerging new ideologies.
4. The changing role of science and technology [20, p. 6–7].

The core hypothesis of EM is that 'production processes are increasingly designed and conducted using ecological criteria' [20, 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 toward greening the curriculum on the one hand and encouraging environmentally oriented extracurricular activities on the other. As reiterated by Khadem and Bagheri [21], Institutional policy reforms, as part of the strategic planning development, are the main bastion for incorporating environmental issues and awareness toward mitigating damage. In the context of EM, 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" [22, p. 26]. Such a culture is nothing other than environmentalism, and it will not become a mediator of environmental attitude/behavior unless there is a clear institutional policy change toward long-term, policy-useful knowledge regarding environmental issues.

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' 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" [14, p. 57]. This is clearly reflected and realized by Beck [22] within the context of the *risk society.*

ENVIRONMENTAL ATTITUDE/BEHAVIOR 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 behavior required for certain environmental actions.

Among those factors, education, knowledge, and awareness have been discussed extensively as influential variables in displaying pro-environmental behavior [23, 24, 25, 26, 27, 28, 29, 30]. The role of educational institutions, regardless of the level of schooling, has proven to be highly effective in terms of environmental awareness and commitment, as well as sensitivity to environmental protection [25, 28, 31, 32, 33]. However, some scholars reported positive attitude and behavior from the students' side; still, there is not a well-structures mechanism for the establishment of environmental awareness in the educational system [34]. As Lozano et al. [35] emphasize regarding the role of the university as the best leader in initiation of sustainable development awareness, the university system needs to restructure by including environmental and developmental issues in curricula, research, physical plant operations, outreach and engagement with stakeholders, as well as 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 EM 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 behavior toward the environment. EM's call for institutional transformation (i.e., the greening of universities) is considered a shift away and revision of the traditional curriculum; environmental education becomes a transformation from rhetoric to reality. As Beck [25, p. 28] 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".

In this study, efforts were made to examine the case of Eastern Mediterranean University (EMU) and its quest to disseminate environmentalism among its consumers in the context of what Stevenson [36, p. 139–140] 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.'

Nevertheless, environmental knowledge can also be conceptualized in the context of education where the former is the product of educational institutions and is a catalyst for green behavior [37].

This is the first study in which the theory of ecological modernization (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 behavior (TPB) through the measurement of the knowledge, attitude, and behavior of students in different fields of study and at varying educational levels. That is we provide a mechanism which demonstrates how educational institutions should function parallel to EM principles which assessing the operation of encouraging pro-environmental behavior based on internal (knowledge, value, conscience) and external factors (non-educational institutions). In other words, while EM sets the context, TPB becomes instrumental in the validation of the environmental knowledge/attitude/behavior nexus (Figure 1).
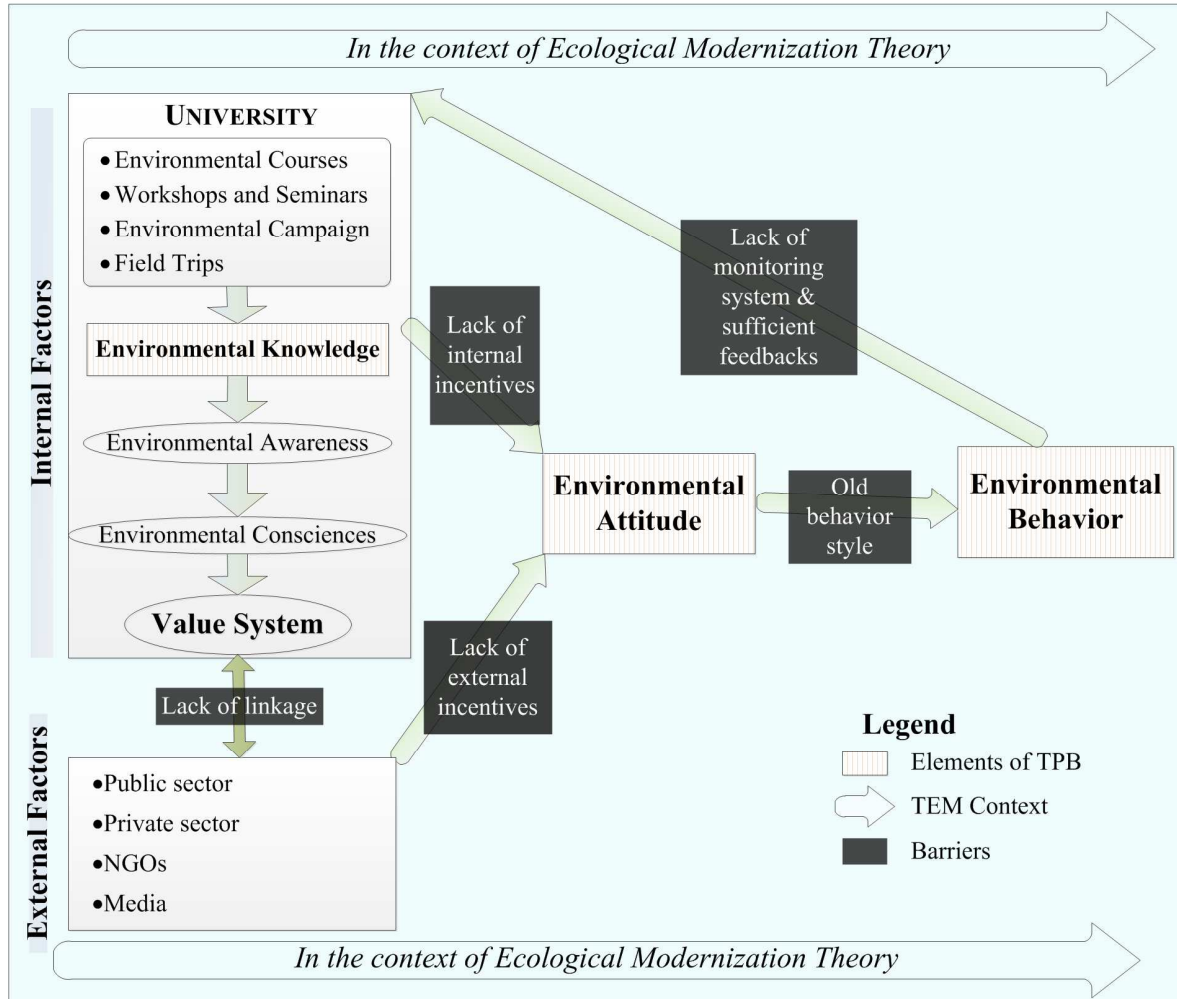
Figure 1. Environmental education model (adopted based on TPB and TEM).
TPB: Theory of Planned Behavior [38].
TEM: Theory of Ecological Modernization [13].

Recently, TPB was employed to support the link between attitude and environmental behavior in various disciplines such as agriculture and ecology [39, 40], business and marketing [41, 42, 43], energy [44] hospitality [45, 46], psychology [47] and education [48]. Perhaps the most cited theoretical model, relevant to environmental education, is the TPB modeled by Ajzen and Fishbein, which became a backdrop for Hines, Hungerford, and Tomera's model of responsible environmental behavior [26, p. 243]. In the latter model, Hines and his colleagues found that certain variables were highly associated with responsible environmental behavior. These variables are "knowledge of issues, knowledge of action strategies, locus of control, attitudes, verbal commitment, and individual sense of responsibility [26, p. 243]. Araghieh et al. [49, p. 255] stated that the 'Educational System is one of the social systems at any country and this system is tasked to create appropriate changes in recognitions, attitudes and eventually learners' behavior rather than conveyance of cultural heritage and human experiences to new generation'.

As exhibited in Figure 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 behaviors (i.e., based on TPB) [38, 50]. 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 toward environmentalism is emphasized as structural (based on EMT) [6, 51]. Therefore, the strength of such a link, based on a partnership framework, is essential in the shift toward greening educational institutions (i.e., institutional policy transformation). Otherwise stated, "The prevailing political will of governments is thus pivotal. Regardless of a genuine commitment to sustainability principles, successful practices remain dependent on the institutional and administrative context in which such changes are negotiated" [52, p. 48]. In addition, external factors also encompass the private sector, nongovernmental 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 behavior. 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" [36, p. 143].

STUDY SITE

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 been awarded 41 international accreditations, recognitions, and memberships by international organizations (http://ww1.emu.edu.tr/en/about-emu/memberships-and-accreditations/c/597).

METHODOLOGY AND DATA ANALYSIS

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 the recognition of the legitimacy of change in the public sphere toward the ecological system. The proponents of TEM believe that this is possible through institutional transformation in all spheres of society [5, 8, 10, 13, 14, 53, 54, 55]. Therefore, we have focused on the case of an educational institution, i.e., 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 behavior that favors environmentalism (i.e., contextualized based on TPB) [50, 56, 57].

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 instruments were adapted from Ivy et al. [25], which was used to measure secondary students' environmental knowledge. The 51 questions contained 16 items for the measurement of students' environmental knowledge, 13 that targeted their attitudes toward environmental concerns, and 13 that gauged their environmental behavior (i.e., four items on their green consumerism and nine on their general environmental behavior). The remaining nine items assessed EMU's environmentally relevant modules within the curricula (Table 1). In order to reduce common method bias, one of the procedural remedies proposed by Podsakoff et al. [58] was applied to provide respondent anonymity. Therefore, students were assured about confidentiality of the information that they provided in the questionnaire.

Table 1-Respondets' profile

Variable	N	%	Variable	N	%
Age			*Educational Level*		
18-27	188	78.0	2-year program	32	13.3
28-37	46	19.1	4-year program	130	53.9
38-47	4	1.7	Master program	53	22.0
More than 48	3	1.2	Doctoral program	26	10.8
Total	241	100.0	Total	241	100.0
Gender			*Major field*		
Male	134	55.6	Engineering	96	39.8
Female	106	44.4	Social Science	145	60.2
Total	241	100.0	Total	241	100.0

A nonrandom 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 were selected from students from different age groups, educational levels, gender, and study filed. In total, 277 questionnaires were returned, of which 241 items were valid and usable. Thus, the response rate was 40%. The independent t-test was used to check the 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 result of the pilot study indicated that the questionnaire items were understandable and unambiguous. The reliability of the instruments was measured using Cronbach's alpha. Also, the reliability coefficients for three dimensions-environmental knowledge, attitude, and behavior—met the acceptable cutoff, indicating 0.61, 0.65, and 0.63, respectively [59]. 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 version 20 was utilized [60].

To provide further information about the selected sample, profiles of the students are summarized in Table2. Accordingly, the majority of the students (78 %) are aged between 18-27 years old. Nineteen percent of the students are between 28-37 years old while the rest (2.9 percent) are 38 years old and above. About 13 % of the respondent study are in 2-year program, 54 % are in the 4-year program, 22 % are in the M.S. program and about 10 % are PhD students. About 55 % of the students are male and 44 % are female. Major filed study of 60 % of the students is in social sciences including, tourism management, business management, economics and finance, psychology, and literature. About 40 % are majoring in engineering fields including: industrial engineering, mechanical engineering, civil engineering, and electrical and electronic engineering (See Table 2).

Table2. Breakdown of the instruments

Dimensions	No. of Items
1. **General environmental knowledge**	(16) Items
2. **Attitudes toward environment**	(13) Items
3. **Environmental behavior:**	(13) Items
• **Green consumerism (4 items)**	
• **General behavior (9 items)**	
4. **EMU's environmentally relevant modules/ Curricula**	(9) Items
Total items	(51) Items

ANALYSIS AND RESULTS

To meet the objective of the study, the mean scores for the students' environmental knowledge through attributes of land, air, water, noise and global issues have been calculated and are presented as a percentage in Table 3.

Table3. Descriptive statistics of respondents' knowledge regarding environmental facts, concepts, and global environmental issues

Issues	Items	Answers Options %					Total%
		1	2	3	4	Don't Know	
Land	*Which 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	
	Which is a renewable resource?	8.7	10.8	9.5	49.8*	21.2	
Air	*What is the effect of burning coal and oil?*	4.1	11.6	11.6	56.4*	16.2	**51**
	Which is the major air pollutant (by weight) discharged by motor vehicles?	39.4*	38.6	5.4	3.3	13.3	
	Which 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	
	Which is the cause of an increase in carbon dioxide in the atmosphere?	46.9*	15.4	12.0	7.9	17.8	
	Which statement is true about air pollution?	29.9	10.8	9.5	39.0*	10.8	
Water	*Which is the major source of oil pollution in the oceans?*	25.7	36.5*	15.8	9.1	12.9	**36**
	Why are fish killed when waste is thrown into bodies of water?	27.4	10.4	13.7	32.0*	16.6	
Noise	*Which does not contribute to an increase in noise levels?*	24.5	29.5	10.0*	24.5	11.6	**10**
Global Issues	*Which increases the acidity of rain?*	15.4	18.3	13.3	25.7*	27.4	**28**
	Which is the effect of deforestation?	5.8	24.9	10.0	41.1*	18.3	
	Which 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 behavior of students by field of study, gender, and nationality (continent) were compared using the t-test (see Table 4).

Table4. Compare mean of environmental attitude and behavior of respondents with different major, gender and original continent.

Mean comparisons	Field of Study					Gender					Students' Origin				
	Engineering		Social sciences			Male		Female			African		Asian		
Variables	Mean	SD	Mean	SD	*t*-test	*Mean*	*SD*	*Mean*	*SD*	*t*-test	*Mean*	*SD*	*Mean*	*SD*	*t*-test
Environmental attitude	3.04	.52	3.22	.50	-2.65*	3.15	.52	3.15	.49	.002 (ns.)	3.13	.50	3.15	.52	-.26 (ns.)
Environmental behavior	2.86	.46	2.86	.44	-.02 (ns.)	2.89	.44	2.81	.44	1.28 (ns.)	2.85	.44	2.86	.44	-.26 (ns.)

Note: * significant at level of 0.01, (ns.): not significant.

The ANOVA was employed to compare mean scores of the environmental attitude and behavior of the respondents, in the context of four modules (i.e., courses, workshops, trips and campaigns) within the curricula, toward the dissemination of environmental education (see Figure 2).

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 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 3). 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 %). Average considered being 50%.

The consistency of our study is only similar to that conducted by Ivy et al. [25] in terms of the knowledge of noise pollution as an environmental issue. In other cases, such as Blum [61, 62], Richmond [63], and Bohl [64], 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. [25], who studied Singaporean students.

Environmental attitude (Dimension 2)

The students' learned attitude precedes their behavior where the latter is associated with taking action on an issue of concern—in this case, environmental concern. The idea of attitude toward a behavior is theorized and explained by Fishbein and Ajzen [65] and Azjen [56] through TPB. Based on TPB and its sister theory, the theory of reasoned action (TRA), which has been explored by numerous scholars [66], that knowledge through education results in an attitude toward a behavior/action with a certain issue as the target. Thus, being knowledgeable of the environment can possibly result in an individual taking positive action toward the environment. One's attitude toward 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 [23, 31].

The composite scores of 13 items allocated for measurement of student's environmental attitude were computed and the results indicate that the average for the respondents' attitude is 3.15 (SD= .55) out of 5, which is the highest scale. The average score for environmental behavior of the students is relatively low (M=2.86, SD=.44). The percentage rate of environmental knowledge that was obtained and based on correct answers (through Likert scale), showed a mean value of 1.8, which is very low (Refer to Table 4). The results are in accord with the presented theoretical framework, which demonstrates a low level of knowledge possibly will lead to a poor environmental attitude and behavior. This finding is in line with the study conducted by Dimopolos and Pantis [67], Thapa et al. [68], and Monroe et al. [69], where a positive correlation between environmental knowledge and attitudes/behavior was demonstrated.

Environmental behavior (dimension 3)

This dimension was measured by 13 items in two categories, where the mean attitude and behavior scores with the standard deviation for engineering and social science students were illustrated. In addition, the mean and standard deviation scores based on gender and nationality (continent) were shown (Refer to Table 4).

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 social science students ($t=-2.65$, $p<.01$). The environmental attitude of the social science students (M=3.22, SD=.50) is stronger than that of the engineering students (M=3.04, SD=.52). However, the mean scores for the environmental behavior of engineering and social science students are not significantly different ($t= -.02$, *ns.*). The environmental attitude and behavior of male and female students is not statistically different. A comparison of the environmental attitude and behavior of African and Asian students revealed no significant differences between the two groups (t (241) $=- .26$, *ns.*) (Refer to Table 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 dissemination of environmental knowledge/awareness among the students. An ANOVA test was conducted to compare the means of the educational level of students in regard to environmental attitude and behavior. The analysis revealed no significant differences in the environmental attitude (F (3,241) =.54, *ns.*) and behavior (F (3,241) =1.2, *ns.*) of students terms of 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 two-year programs, four-year programs, master programs, and doctoral programs. As depicted in Figure 2, 39% of the respondents claimed that they have taken no environmentally related/relevant modules, 59% stated that they have never participated in any workshop on environmental issues, 54% responded that they have never participated in any field trip for environmentally oriented educational purposes. Fifteen percent of the students have never participated in any campaign related to an environmental issue. As depicted in the last column of Figure 2, only 2% of the students have taken part in more than three environmentally oriented courses, 5% have attended more than three workshops, 5% have taken more than three field trips, and 6% have taken part in campaigning for environmental purposes.

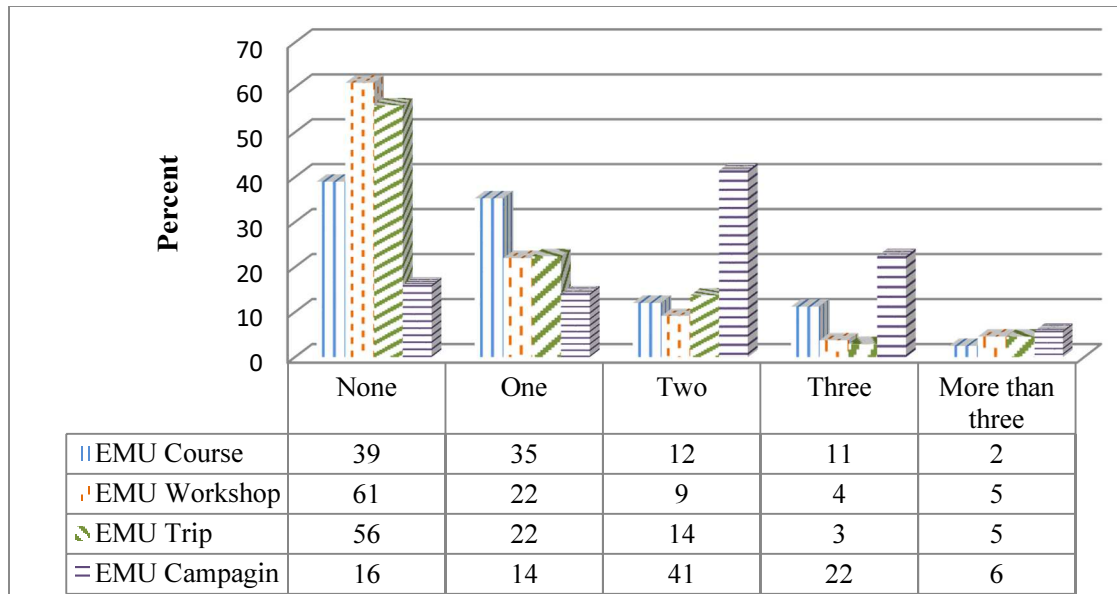|	None	One	Two	Three	More than three
‖ EMU Course	39	35	12	11	2
·ˌ EMU Workshop	61	22	9	4	5
◣ EMU Trip	56	22	14	3	5
≡ EMU Campagin	16	14	41	22	6

Figure 2. Environmentally relevant modules at EMU (In the context of EM).

What is revealed through this dimension has profound implications for attitude and behavior, as knowledge and attitude are considered antecedents of behavior toward environmental actions (i.e., based on TPB) [50, 70, 71]. 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 upon university and public sector partnerships geared toward what Weidner [1] called the "ecologicalization" of institutions and organizations in various social systems (and scientific disciplines), which is slowly progressing in the developing nations. It is hoped that this will pave the way to sustainable development.
Consonant with other empirical studies [72, 73], the independent sample t-test was employed to check none-response bias. Respondents were grouped as early and late respondents. The two groups were compared on their responses to the question items using the 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 nonresponse error in survey research [73, 74]. Based on the results of the independent-test ($p<.01$), non-response bias did not emerged in the data.

CONCLUSION

Notwithstanding the growth of environmentally oriented curricula in the last few decades, along with the establishment of environmentally relevant fields [75, 76, 77, 3], the following question remains: To what extent is environmental education deliberately designed to instill the behavior of environmentalism in students?

The first major purpose of the present study was to test the degree of the 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 [1].

As an underpinning framework for this study, the convergence between TPB and EM is modeled (Figure 1), and the dissemination of knowledge through educational institutions becomes fundamental to changing behavioral patterns toward environmental concerns. As the environmental crisis intensifies, it is becoming increasingly clear that addressing it requires a radical change in human behavioral patterns.

This study has presented a provisional approach to the effectiveness of 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 [57], will result in the generation of attitudes/behaviors among the students geared toward upholding environmental values. As Stevenson [36, 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 the students as future policy makers, planners, managers, and consumers has fallen on deaf ears. Therefore, EMU has remained aloof to EM theory as a school of thought that "not only…contributes to environmental social sciences and policy, but also strengthens the linkages between those trans-disciplinary pursuits and mainstream social science" [20, 34]. 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 Figure 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 behavior toward an issue are dependent on knowledge and information that is gained prior to commitment to the issue in question [50].

Overall, the results of the present study revealed 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 behavior.

Various scholars have discussed and analyzed the role of educational institutions in instilling environmental awareness geared toward a commitment to environmental sustainability among students enrolled in universities, colleges, and primary/secondary education [9, 26, 78, 79]. However, this study contributed to the role of educational institutions by focusing on the modules/means that are essential for the construction of attitude/behavior among the 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 behavior [35].

Such environmental behavior among the students can be placed on a continuum. At one end, the worst-case scenario of environmentalism, known as *anthropocentricity*, is the dominant behavior. This is the behavioral 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 behavioral state when students graduate with compassion toward the environment [80]. This is also in line with Kazemi et al.'s [81] findings who investigated school children and their

environmental behavior through interaction between 'organization', 'education-culture', and environment. They emphasized that coordination of curriculum activities based on those dimensions will result in closer affinity between school children and environment.

This research was 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, current study considered several factors out of 18 social and personal factors that influence pro-environmental concern and behavior, is suggested to measure all factors for future research to provide more comprehensive view in 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 toward EM.

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