

Promotion of Environmental Literacy in University Education: A Desirable Option for Achieving Nigeria's Environmental Policy Objectives

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Abstract

Environmental Literacy (EL) is an outgrowth of Environmental Education (EE). The 1997 Belgrade Charter of the United Nations defines the goal of EL as being to develop a world population that is aware of and concerned about the environment and its associated problems. In 1992, C.E. Roth, identified three Environmental Literacy Levels (ELL_s) which he classified as nominal (ELL₁), functional (ELL₂) and Operational (ELL₃) levels. Breadth of Knowledge of the environment and the ability to feature effectively in environmental issues are minimal at ELL₁, more ingrained at ELL₂ and advanced at ELL₃. As producers of personnel who develop and manage society's institutions, Universities are rightly seen to have the important role to inculcate the necessary literacy components (awareness, knowledge, skills and so on) that would enable their products (graduates) to contribute towards creation of an environmentally sustainable societal future. The graduates indeed need to acquire the three levels of EL. Nigeria's environmental policy objectives, as highlighted in this paper, need such products to effectively achieve them. Unfortunately, a study conducted in 2010, and which has been succinctly reported in this paper by the author, reveals that Nigerian University students, generally, acquire most of ELL₁, less of ELL₂ and least of ELL₃. Such graduates would hardly be environmentally literate enough to effectively facilitate achievement of the various objectives of Nigeria's Environmental Policy. This paper suggests various approaches that need to be adopted to enhance environmental literacy education in Nigerian universities as a veritable option for the realization of Nigeria's environmental policy objectives.

Keywords: Environmental Literacy, University Education, Environmental, Desirable Option, Environmental Policy Objectives.

1. Introduction

The promotion of citizenship education for adults as well as school children is usually identified as the primary task of schooling. A continuing assumption is that the success of the formal education system is relatively defined by its ability to prepare individuals to become citizens that would function effectively in today's and tomorrow's society (U.S. Department of Education, 1991). To achieve this success, the development of both general and specific literacies is no doubt, essential. Levels of literacy are generally assumed to exist, but are not often defined. With respect to environmental literacy, Roth (1992) has identified the following three levels; namely:

- i) Environmental Literacy Level One (ELL₁), which Roth referred to as the "Nominal Level". This level develops the ability to recognize many of the basic terms used in communicating about the environment and to provide rough, unsophisticated working definition of their meanings;
- ii) Environmental Literacy Level Two (ELL₂), called the "Functional Level" depicts a broader knowledge and understanding of the nature and interactions between human social systems and other natural systems;
- iii) Environmental Literacy Level Three (ELL₃), the "Operational Level", indicating progress beyond functional literacy in both the breadth and depth of understandings and skills. Persons at the operational level routinely evaluate the impacts and consequences of human actions on the environment. Such people also synthesize pertinent information, choosing among alternatives. They advocate action positions and take actions that work to sustain or enhance a healthy environment. People at the ELL₃ demonstrate a strong, ongoing sense of investment in and responsibilities for preventing or remediating environmental degradation, both personally and collectively, and are likely to be acting at several levels from local to global in so doing.

1.1 Environmental Literacy: The Outgrowth of Environmental Education

The creation of an environmentally literate citizenry is one of the goals of environmental education. The United Nations Belgrade Charter of 1975 and Tbilisi Declaration of 1997 make this clear in their definition of the goal of environmental education as being (EETAP, 1971:1):

... to develop a world population that is aware of, and concerned about,

the environment and its associated problems by making individuals and communities understand the complex nature of the natural and built environments and to participate in a responsible and effective way in anticipating and solving environmental problems.

1.2 **Issues about the Development of Environmental Literacy**

The challenge for environmental educators is to provide meaningful educational learning experiences that help raise awareness in order to foster environmental ethics that will have long lasting impacts. If environmental educators succeed in developing methods to inculcate such environmental ethics, there is hope for the citizenry to influence future policies and positive environmentally focused decision making.

Developing environmental literacy has progressively become a major task for society. Different sectors of society, such as communities, schools, the media and workplace, tend to support this today as an on-going venture. The responsibilities of environmental educators thus include development of an environmentally literate society capable of internalizing issues and making decisions based on real environmental perspectives. There are a number of educational resources available that can help the educators in understanding the concepts behind environmental literacy.

Although the term environmental literacy has been used for more than two decades, it continues to lack precise definition. It has received a good deal of attention since 1968 and creates positive images while conveying little in the way of substantive information or direction. Later, renewed interest in environmental education has afforded an opportunity to reconsider and highlight the interrelationships between environmental education and environmental literacy and to define the latter so that it can be a useful term and concept

To illustrate, the 1970 United States of America Environmental Education Act, for example, received essentially no priority from the U.S. Department of Health, Education and Welfare, where it was housed. Over the years, however, significantly greater interest has been demonstrated by American conservationists and environmentalists whose priority is environmental quality and who see education as a mechanism for promoting it. For this reason, the U.S. 1990 National Environmental Education Act received significant attention from its host unit, the U.S. Environmental Protection Agency and from conservationists and Environmentalists in general (Marcinkowski, 1991).

1.3. **The Role of Universities**

The role of Universities in the creation of environmentally sustainable future is captured and stressed in the 1990 Declaration by the Conference of University Presidents and Chancellors which took place in Talloires, France. The Declaration was a ten-point action plan for incorporating sustainability and environmental literacy in college and university teaching and research. The declaration provided a justification for getting universities involve in the promotion of sustainability and environmental literacy in the following words (ULSF, 1990:1):

Universities educate most of the people who develop and manage society's institutions. For this reason, universities bear profound responsibilities to increase the awareness, knowledge, technologies and tools to create an environmentally sustainable future.

Nigeria was among the pioneer fifteen nations that endorsed the Talloires Declaration.

1.4. **Purpose of the Paper**

The purpose of this paper is to practically demonstrate the desirability of promoting environmental literacy education in Nigerian Universities for ensuring the achievement of Nigeria's environmental policy objectives.

2. **Nigeria's Environmental Policy Objectives**

The goal of Nigeria's Environmental Policy is to achieve sustainable development in the country. Specifically, the policy objectives are to (Federal Republic of Nigeria, 1989:3):

- i) secure a quality of environment adequate for good health and well-being;
- ii) conserve and use the environment and natural resources for the benefit of present and future generations;
- iii) restore, maintain and enhance the ecosystems and ecological processes essential for the functioning of the biosphere to preserve biological diversity and the principle of optimum sustainable yield in the use of living natural resources and ecosystems;
- iv) raise public awareness and promote understanding of the essential linkages between the environment, resources and development, and encourage individual and community participation in environmental improvement efforts; and
- v) co-operate in good faith with other countries, international organizations and agencies to achieve optimal use transboundary natural resources and effective prevention or abatement of transboundary environmental degradation.

Proper implementation of these objectives, as further highlighted in the policy, is expected to lead to:

- i) improvement in the quality of life of the people;
- ii) the establishment of adequate environmental standards as well as the monitoring and evaluation of changes in the environment and the adoption of appropriate restorative measures;
- iii) the acquisition and publication of up-to-date environmental data and the dissemination of relevant environmental information;
- iv) prior environmental assessment of proposed activities which may impact the environment or the use of a natural resource.

Looking closely at the objectives of Nigeria's Environmental Policy and their expected outcomes if properly implemented, as listed above, one may observe clearly that achievement of the objectives and their outcomes would require knowledgeable citizenry who have acquired the various levels of environmental literacy. Given the mass of students that are exposed to university education in Nigeria and the already emphasized role of universities in the promotion of environmental literacy and production of high levels of environmentally literate citizenry, it would stand to reason that promoting environmental literacy in the universities would help create cohorts of citizens that would assist in the realization of Nigeria's environmental policy objectives. How this is being or would be accomplished is the concern of the rest of this paper.

3. University Education and International Efforts to Integrate Environmental Literacy

Beyond the concerns regarding the appropriate knowledge, skills and disparity that should be associated with environmentally literate citizens, attention has also specifically been drawn to what universities and other tertiary institutions should do to produce such citizens. From February 18 to 20 1994, barely two years after a World Earth Summit in Rio de Janeiro, Brazil, a Campus Earth Summit was convened at Yale University, USA. The summit brought together 450 University faculties, staff and students from 22 countries, 6 continents and all the 50 states of North America. The purpose of the Campus Summit was to craft a Blue-print for a Green Campus comprising a set of recommendations for higher education institutions across the globe to work towards the production of environmentally literate persons that would ensure environmentally sustainable future. Teresa Heinz, the Chairman of Heinz Family Foundation Unit that organized the summit, defined a Green Campus as (Heinz, 1995:2):

One that integrates environmental knowledge into all relevant disciplines, improves environmental studies course offerings, provides opportunities for students to study campus and local environmental problems, conducts environmental audits of its practices, institutes environmentally responsible purchasing policies, reduce campus waste, maximize energy efficiency, makes environmental sustainability a top priority in land-use, transportation, and building planning, establishes a student environmental center, and supports students who seek environmentally responsible careers.

In her introductory remark at the campus summit, Heinz (1995:7) also spoke of lapses in the contributions of tertiary institutions toward environmental sustainability as follows:

Colleges and universities wield incredible power and yet, at least in terms of the environment, most have not wielded it well. Our institutions of higher learning provide the knowledge that will guide future architects, engineers, policy makers, community activists, industrialists, mothers, fathers, potential teachers, all nonetheless, with only a few noteworthy expectations, most colleges and universities fail to educate their students in the environmental ramifications of their field of study. We will persist in designing buildings that are energy-inefficient, products that are polluted, and systems that throw off waste, we will go on doing all these things and more, as long as our educators fail to teach their students that it does not have to be this way. There is a better, and less expensive way. Ultimately, design is an expression of intent. What is needed is thought and planning about function, aesthetics, conservation, efficiency – in other words intent Universities have the opportunity to prove that a new model for environmentalism is possible. In this model, individual action counts. In this model, collaboration, too, is essential. In this model, future professionals are taught that the environmental impact of products and services and systems can be efficiently accounted for in the design phase. In this model, the environment and the economy will be allies, not enemies. In this model,

the interconnectedness of things will matter, rather than their separateness.

Furthermore, delegates to the Campus Earth Summit were of the conviction that since colleges and universities educate most of the people who educate the children, it “becomes clear that transforming campuses into catalysts for environmental sustainability is a very good first step towards changing the world” (Heinz, 1995:2).

The Blue Print that emerged out of the series of discussions in a collaborative process made ten recommendations. The first three of the ten recommendations can be considered as having direct relevance to the promotion of environmental literacy among would-be university graduates. The fourth recommendation advocates integration of Environmental Knowledge into all relevant disciplines.

Other recommendations of the Blue Print required Universities to:

- i) provide appropriate resources for faculties to integrate environmental issues and perspectives into their existing courses;
- ii) become signatories to the Talloires Declaration, an international declaration of principles dedicated to fostering environmental literacy;
- iii) improve undergraduate environmental studies course offerings through:
 - a) formation of a review committee in each institution to produce report on the quality of any existing or proposed environmental studies course offerings;
 - b) publicize, distribute and adopt the recommendations made by the review committees;
 - c) make a commitment to provide funding for teaching and administration of the reviewed courses;
 - d) provide opportunities for students to study campus and local environmental issues;
 - e) organize classes in which students could obtain academic credit for research on campus and local environmental issues;
 - f) make a commitment to use the outcome of the research studies to help formulate more effective and innovative approaches to campus and local environmental issues.

4. Environmental Literacy Education in the Nigerian University System

Using three Universities in the South-South Geopolitical Zone of Nigeria which is part of the country’s Niger Delta that experiences serious environmental problems (various forms of pollution, land and water degradation and so on) arising from vast oil and gas exploration, Eheazu (2010) conducted a study on the environmental literacy levels of graduating (final-year students) of the universities. The three universities were selected because they were the oldest in the South-South Zone. Again, it was envisaged that environmental problems of the zone would have prompted the three universities to infuse environmental matters in their cognate departments and courses.

The study involved a sample of 1,514 (60%) of a population of 2,527 final-year students from seven departments (Physics, Chemistry, Biology, Adult and Community Education, Science Education, Geography and Environmental Studies and Business Education) in four faculties (Science, Education, Social Sciences and Management Sciences) of the Universities of Port Harcourt (UNIPORT), Calabar (UNICAL) and the Rivers State University of Science and Technology (RSUST). Selection of the final-year students for the study was based on the anticipation that such students would have acquired nearly all (if any) environmental knowledge, skills and attitudes their universities could have afforded them during their four years of study. Distribution of the final-year students’ population and sample for the study is shown in table 1 below.

Table 1
Distribution of the Population and Sample of Students for the Study by Universities/Faculties/ Departments

FACULTY	DEPARTMENT	POPULATIONS & SAMPLES BY UNIVERSITY			OVERALL FACULTY POPULATION & SAMPLE
		UNIPOINT	UNICAL	RSUST	
Science	Physics	55(33)	166(100)	27(16)	(623(373))
	Chemistry	29(17)	57(34)	53(32)	
	Biology	82(49)	130(78)	24(14)	
Education	Adult & Community Education	75(45)	58(35)	45(27)	278(166)
	Science Education	64(38)	17(10)	19(11)	
Social Sciences	Geography & Environmental Studies	76(46)	413(248)	54(32)	543(326)
Management Sciences	Business Management	100(60)	954(572)	29(17)	1,083(649)
Total		481(288)	1,795(1,077)	252(149)	2527(1,514)

A questionnaire modelled after Roth's (2002) *Questioning Framework for Shaping Environmental Literacy* was used for the study. Percentages, means, the Pearson Product Moment Correlation Coefficient, The Spearman-Brown Formula and the Analysis of Variance (ANOVA) were the statistical methods used to analyze the obtained data.

Table 2 below shows a summary of the findings in relation to the students' overall percentage mean scores at various levels (ELL₁, ELL₂, ELL₃) of Environmental Literacy

Table 2
Overall Percentage Mean (X) Scores of the University Students in the Selected Universities, Faculties and Programmes/Departments at various Levels (ELL₁, ELL₂, ELL₃) of Environmental Literacy

FACULTY	PROGRAMME/DEPT.	UNIVERSITY	% -AGE MEAN SCORES OF STUDENTS		
			ELL ₁	ELL ₂	ELL ₃
SCIENCES	Physics	UNIPOINT	87	60	47
		UNICAL	84	65	44
		RSUST	81	62	48
	Chemistry	UNIPOINT	94	72	68
		UNICAL	90	66	43
		RSUST	82	67	45
	Biology	UNIPOINT	95	62	60
		UNICAL	80	71	57
		RSUST	75	66	48
EDUCATION	Adult & Community Ed	UNIPOINT	76	55	44
		UNICAL	70	58	42
		RSUST	76	63	49
	Science Education	UNIPOINT	72	53	48
		UNICAL	70	56	44
		RSUST	80	71	57
SOCIAL SCIENCES	Geography & Environmental Studies	UNIPOINT	86	64	56
		UNICAL	84	72	58
		RSUST	73	67	47
MGT. SCIENCES	Business Management	UNIPOINT	68	49	39
		UNICAL	66	50	38
		RSUST	67	48	33

Source of data: Computations from Students' Responses to the Questionnaire

Further analysis of the scores in table 2 above revealed among other things that the students acquired the nominal level (ELL₁) of Environmental literacy most, less of the functional level (ELL₂) and least of the operational level (ELL₃). It was also established among other facts, that the three Universities studied did not differ significantly in exhibiting this trend of limited EL acquisition. Two serious revelations from this study, among others, include that (Eheazu 2010:94-95):

- i) Nigerian universities are yet to fully embrace and implement the 10 point action plan of the Talloires Declaration (referred to earlier) to which Nigeria is a signatory on behalf of her universities, and which, among other things, requires the universities to educate for environmentally responsible citizenship (ULSF, 1990);
- ii) Specifically, General Studies (GES) which is a compulsory course for all Nigerian Universities, is yet to identify with the global movement to ensure that “Core General Education requirement for undergraduate degrees incorporate an indepth focus on sustainability, including an environmental literacy component” (Filho, 2002:3).

Given the above empirically revealed scenario in the Nigerian University system, it would be pertinent to argue that if nothing is done to incorporate environmental literacy education into Nigeria’s university courses and programmes, most Nigerian University students will graduate and still be functionally illiterate environmentally.

5. The Way Forward

In the light of the highlighted low levels of environmental literacy acquisition by Nigerian University graduates, raising the desired crop of environmentally literate citizen to assist in the achievement of Nigeria’s environmental policy objectives through University education would surely require adopting some critical positive steps. In this wise, and based on the research findings of Eheazu (2010), the following approaches are hereby suggested:

- i) The National Universities Commission (NUC) of Nigeria should make inclusion of relevant environmental sustainability courses mandatory for Nigerian Universities, and thereby, among other things, honour Nigeria’s endorsement of the Talloires Declaration;
- ii) The various Nigerian Universities should design core environmental literacy courses/programmes which would enable students to study campus, national and global environmental issues. Such courses should also form an important part of the compulsory General Studies (GES) programmes of the universities;
- iii) Nigerian Universities should provide Environmental Studies course offerings as electives in all non-environmentally oriented undergraduate disciplines;
- iv) To ensure the success of recommendation No.(iii) above, as well as promote students’ acquisition of the three levels of EL, each Nigerian University should include in its Statement of Academic Policy, a section which would stipulate that **upon graduation, all students will possess the knowledge, skills and values to work towards an environmentally sustainable future**;
- v) Environmentally-related disciplines in Nigerian Universities (e.g. botany, geography and so on) need to broaden their contents beyond their basic curriculum concerns to include social, economic and political dimensions of human interaction with natural systems. This will provide students in those disciplines the opportunity to acquire not only remarkable environmental awareness/knowledge at the ELL₁, which is currently the case as revealed in Eheazu (2010), but also desirable attitude, values, commitment and skills (at the ELL₂ and ELL₃) needed to create new patterns of behaviour in individuals, groups and society for environmental protection and improvement as recommended by UNESCO (1978).

6. Summary and Conclusion

Environmental literacy exists at three levels, nominal, functional and operational levels. The second and third levels depict advancement in depth and breadth of understandings and skills needed to evaluate and tackle different forms of environmental issues and problems. Renowned educationists the world over recognize the important role of universities in the production of environmentally literate citizenry who would acquire the three levels and thus effectively be adequately predisposed towards effectively contributing to the solution of local as well as global environmental problems.

Nigeria’s environmental policy objectives essentially require an environmentally literate citizenry, especially graduates, that would serve as facilitators (personnel) in the various areas of environmental needs specified by the policy. In the light of the findings of Eheazu’s (2010) study cited in this paper, it is obvious that current course provisions in Nigerian Universities cannot raise the requisite cohorts of graduates with the necessary

environmental literacy levels to meet the country's environmental policy needs. Accordingly, it would be necessary for Nigeria to promote environmental literacy education in all her Universities as a good option towards the achievement of her environmental policy objectives. The adoption of the relevant suggestions made in this paper would be an important approach towards attaining the much needed enhancement of the environmental literacy levels of future Nigerian University graduates.

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