



Environmental Education for Sustainable Development: The Case of University of Cape Coast-Ghana

Sarah Darkwa^{1*}

¹Department of VOTEC, University of Cape Coast, Cape Coast, Ghana.

Author's contribution

The sole author designed, analyzed, interpreted and prepared the manuscript.

Article Information

DOI: 10.9734/BJESBS/2016/25158

Editor(s):

(1) Madine Vander Plaats, Department of Sociology and Criminology, Saint Mary's University, Canada.

Reviewers:

(1) Grecu Eugenia, Politehnica University of Timisoara, Romania.

(2) Eugenia Iancu, Stefan Cel Mare University Suceava, Romania.

(3) Sergey A. Surkov, International Institute of Management LINK Zukovsky, Moscow, Russia.

Complete Peer review History: <http://sciencedomain.org/review-history/14936>

Received 20th February 2016

Accepted 12th May 2016

Published 7th June 2016

Original Research Article

ABSTRACT

Aim: To determine students' knowledge in greening, sustainable development and the readiness to embrace environmental education as part of the curricular in the different programs offered at the University of Cape Coast-Ghana as a way of preparing them well for future work.

Study Design: A survey was used for the study.

Place and Duration of Study: The University of Cape Coast from May to June 2015.

Methodology: A total of 270 students from 23 different departments of the University of Cape Coast were sampled and studied. A questionnaire was self-developed, pilot tested and distributed to the students. Their knowledge in sustainability, sustainable development, greening among others was assessed. Students' interest in learning about environmental issues should it be introduced as part of the curriculum in different programs was sought.

Results: Out of the 270 questionnaires distributed, 254 were retrieved giving a response rate of 94%. There were 150 males and 104 females ranging from 19-33 years with a mean age of 23 years. Seventy-two percent of the students believed that the U.C.C. campus is green enough and 85% believed that there is a relationship between green and sustainability. About 87% welcomed

*Corresponding author: E-mail: snaadom@gmail.com;

the idea of adding environmental issues to the curricular of their respective programs and 83% suggested it be added to the curricular of all programs offered at the University.

Conclusion: Students may have a good idea of what green, sustainability and sustainable development are but their willingness to study environmental issues will help augment their knowledge in these. There is need for further work to validate how this gained knowledge will transcend into helping graduates secure jobs after graduation and reduce graduate unemployment.

Keywords: Sustainable development; education; tertiary education; green.

1. INTRODUCTION

Education has been the foundation of development in most countries with Ghana being no exception. Education in Ghana occupies a highly important place especially in the socio-economic development of the country. Students' enrollment in colleges and universities have increased greatly to match the increasing population in Ghana and its relative need for trained personnel to manage the industrial sector and other fields to sustain the country's technological growth. One would have expected that the upsurge of private universities in the country coupled with the increase in enrollment at the existing public universities would have produced enough qualified graduates to properly manage our resources and promote sustainable economic development in the country. Rather it seems there is an escalating graduate unemployment and lack of jobs in Ghana. This trend is disturbing and calls for a critical look at the content, presentation and relevance of the different programs being offered at the country's tertiary institutions. How sustainable is our education which intends hopefully to define development in the country? Sustainable development comprises three constituents, the environment, society and economy which promote welfare among people [1]. Various individuals, groups and organizations have highlighted the need to include environmental education in regular school curricular and programs as a way to prepare graduates better for natural resource management and work after school.

In 2005, the United Nations Decade of Education for Sustainable Development (DESD) was introduced to make stronger government commitments to include sustainable development and environmental education into all education systems, strategies and public awareness by 2014. Education must be made climate compatible and linked to sustainable development in order to meet the needs of the 21st century and beyond. Education for

Sustainable Development (ESD) is a method of teaching and learning which focuses on the ideals and principles that underlie sustainability. As such, ESD promotes multi-stakeholder social learning; emphasizes the empowerment of communities and citizens; engages with key issues such as human rights, poverty reduction, sustainable livelihoods, climate change, and gender equality in an integral way; and encourages changes in behavior that will create a more sustainable future [2].

Anderson and Morgan [2] suggest that environmental education, climate change and scientific literacy, disaster risk reduction and preparedness, and education for sustainable lifestyles and consumption need to be incorporated in teaching and learning. They further stressed the need for learners to be conversant with basic scientific concepts, knowledge that will allow them to differentiate certainties from uncertainties, risks and consequences of environmental degradation, disasters and climate change, knowledge of mitigation and adaptation practices that can add to creating resilience and sustainability.

Established in October, 1962, the University of Cape Coast is situated along the Cape Coast – Takoradi highway. It was established initially to train graduate teachers in the Arts and Sciences to teach in secondary or high schools, Colleges of Education, Polytechnics and Technical Institutions in Ghana. Today, the University of Cape Coast trains not just teachers but doctors, lawyers', and agriculturists among others. It has adopted the collegial system with five main colleges, the College of Health and Allied Sciences; College of Agriculture and Natural Sciences; College of Humanities and Legal Studies; College of Distance Education and College of Education Studies and a School of Graduate Studies. The University confers diploma certificates, bachelors' degree, masters' degree and doctoral degree on students.

Education that is geared towards achieving sustainable development must in itself be

sustainable [3]. Sustainability has often been centered on the environment and economy neglecting other aspects such as institutional sustainability [4,5,6,7]. According to the Brundtland commission [8] in the book "Our Common Future", sustainable development "meets the needs of the present without compromising the ability of future generations to meet their own needs". The Brundtland Commission's report prepared the way for the UN's Earth Summit, which was held in Rio de Janeiro, Brazil, in 1992. At this conference, clearly explained in Agenda 21, there was a declaration and an all inclusive plan of action. Through this plan, sustainable development attained the internationalism needed to drive it further and also became an instituted model in international politics. The 36th chapter of Agenda 21 is devoted to education and begins by stating that "education is critical for promoting sustainable development. Both formal and non-formal education is indispensable to changing people's attitudes so that they have the capacity to assess and address their sustainable development concerns". To plan and offer sustainable development education, the 36th chapter of Agenda 21 offers an exceptional place to start.

Sustainable development has been known to be indistinct although it is this same quality that is able to bring many parties together in dialogue [9] While there is an overall agreement on both principles and supporting concepts guiding sustainable development as well as sustainability, there will certainly be differences according to the local contexts and priorities because there is no universal model of education for sustainable development [10]. As a result content and relevance become important aspects of quality when sustainable development is discussed [10].

Universities are often said to be large economic engines that greatly affect the areas or districts they occupy. In addition, universities are areas of innovation and learning and thus the campus may be an ideal location to impart knowledge on the concepts of sustainable development. If students are provided with such knowledge, they will be able to influence and help others engage in sustainable development wherever they find themselves after their education. The United Nations declared in the year 2005 through to 2014, considered as the decade of Education for sustainable development, how much has education in Ghana helped the country achieve

sustainable development? It is time to look at the possibility of including environmental education and the topic sustainable development in a variety of subject areas in tertiary institutions and not necessarily only as a school subject as recommended earlier by the Canadian Sustainability Curriculum Review Initiative [11]. This declaration supports efforts to inculcate the concept of sustainability into all educational settings including teacher education and other school subjects. Savageau [11] also highlighted the need to personalize and make sustainability more real to students. In a similar vein, Hay and others [12] suggested that the traditional single discipline subjects most university departments emphasize need to be changed. Universities need to partner with industry, government agencies and international agencies so as to be well positioned to make certain that their programs integrate current issues and offer practical insights into environmental and developmental policies [13]. They further stressed that changes in goals, attitudes, values and approaches concerning environment and development have significant implications for Human Resource Development. Do curricula that universities design and implement contain a mix of multidisciplinary and single discipline knowledge and skills? Hay et al. [12] reported that this mix will put graduates in a position that will enable them assess broader issues as well as contribute to the design and management aspects in their areas of specialization. How much environmental education and sustainable development is included in the various programs offered at the University of Cape Coast?

As earlier mentioned, education for sustainable development seems not to have a worldwide agreed conception of sustainable development thus brings up numerous issues such as different people using the same language to mean different things. Scott and Gough [13] suggest that education for sustainable development is actually environmental education. Others like UNESCO EDUCATION FOR SUSTAINABLE DEVELOPMENT IN ACTION [14] have identified knowledge, issues, skills, perspectives and values as the main elements of curriculum that have been adjusted to cover sustainability. Capra [15] gave an alternative view of sustainable development "as a creative process, characteristic of all life", [16] viewing development as a "multidimensional systematic process that is economic, social, ecological and ethical" identifying that "we are inseparable from the web of life of human and non human

communities". A recent workshop "Pre-cop climate change knowledge and leadership festival" organized to catalogue activities on sustainable development and climate change at the Institute for Social Science and Economic Research (ISSER) conference facility, University of Ghana - Legon on the 18th of November, 2015 [17] presented research that argued that the greatest challenges to sustainable development especially in Ghana are environmental issues as have been provided by earlier authors. This argument was based on the fact that most important issues in Africa generally and Ghana specifically are environmentally related like food security, poverty, disease, land degradation, water security, climate change, conflicts, deforestation, natural disasters and urbanization.

Certain measures and steps have been taken in Asia and the Pacific to help improve students' environmental knowledge and skills which are yielding great results and would be worth trying in the sub Saharan region including Ghana. The United Nations Environment Program's network for Environmental Training at Tertiary Level in Asia and the Pacific (NETTLAP) believes that improving the environmental knowledge and skills of educators and trainers in tertiary institutions is profitable to graduates, government, the private sector and the community at large [1]. Also, training methods that usually allow the incorporation of traditional knowledge and practices, and foster political and cultural sensitivity is profitable to a community at large and could be adapted in Ghanaian tertiary education [9]. Again, experiential learning and scenario building are essential to take educational training beyond mere application of theory as often pertained in the Ghanaian education curricula. Population growth and economic, social, and cultural changes in Ghana, which is located in the sub Saharan region of Africa are argumentally pressurizing systems that support life, demanding sustainable ways of achieving strong economic development, social progress, resource use, and environmental management immediately [9,13]. To achieve this, professionals, government officials and community leaders need to have knowledge and skills in environmental education.

The AAU devoted 2006 and 2008 African Universities Day celebrations as well as its 12th General Conference held in Abuja, Nigeria in May 2009 to the theme "Role of Higher Education in Promoting Sustainable Development in Africa". If ensuring that the

continent's higher education institutions continue to remain significant in the continent's developmental needs, then it is pertinent that these higher education institutions are evaluated to assess their progress towards achieving sustainable development education. This study thus focused on finding out from a group of University of Cape Coast students their knowledge in greening, sustainable development and their readiness to embrace environmental education as an extra subject or topic in the curricular of different programs offered at the university.

2. METHODOLOGY

A self developed questionnaire was used to collect data from a group of students studying different programs at the University of Cape Coast. Questions covered issues in "greening", how well students are conversant with sustainability issues, suggestions to improve the "green: environment on campus and the possibility of incorporating environmental education into individual courses taken by students or to the curricula of all programs. The questionnaire was pilot tested using 30 students and the alpha Cronbach determined as 0.76 which is acceptable and so the questionnaires were deemed reliable enough to collect the required data. An examination center which comprised of 3 lecture halls was selected for distribution of questionnaires. Students who occupied these examination halls were from different departments but had gathered together to write examinations for common courses taken by first year students called communication skills and liberals.

These students belonged to 23 different departments and are expected to graduate with Bachelor of Education degrees, Bachelor of Arts degrees and Bachelor of Science degrees among others. Although the students sampled belonged to different departments in the University, they were easily identified as a group because they all meet together for common courses in communicative skills and liberal studies. The group of students selected gives a good representation of the different programs offered at the University of Cape Coast. A total of 270 questionnaires were distributed to the students, out of which 254 completed ones were retrieved. Responses from the questionnaires were collated and analyzed using SPSS version 21.

3. RESULTS AND DISCUSSION

A total of 270 questionnaires were distributed to the students who participated in the study and 254 of those questionnaires were retrieved giving a high response rate of (94%). Participants ranged from 19 years of age to 33

years with a mean age of (23 years). There were 150 males and 104 females. Participants belonged to 23 different departments offering different programs at the University of Cape Coast. The programs offered by these students ranged from Education through the Humanities to the Sciences.

Table 1. Demographic characteristics of participants (N=254)

Particulars	Frequency	Percent (%)
Age (years)		
18	0.0	0.0
19	4.0	1.6
20	48	18.9
21	64	25.2
22	65	25.6
23	32	12.6
24	17	6.7
25	4.0	1.6
26	17	6.7
27	2.0	0.8
28	0.0	0.0
29	0.0	0.0
30	0.0	0.0
31	0.0	0.0
32	0.0	0.0
33	1.0	0.4
Program		
B.Ed. Social science	5.0	2.0
B.Ed. Health science	7.0	2.8
B.Ed. Accounting	15	5.9
B.Ed. Arts	10	3.9
B.Ed. Mathematics	11	4.3
B.Ed. Basic education	10	3.9
B.A. Social science	18	7.1
B.A. Anthropology	7.0	2.8
Business management	18	7.1
Bachelor of commerce	10	3.9
B.A. Arts	15	5.9
B.A. Communication studies	10	3.9
B.Sc. Mathematics	10	3.9
B.Sc. ICT	11	4.3
B.Sc. Computer science	11	4.3
B.Sc. Optometry	10	3.9
B.Sc. Chemistry	12	4.7
B.Sc. Molecular biology & biotechnology	10	3.9
B.Sc. B.Sc. Human biology	15	5.9
B.Sc. Biomedical forensic science	10	3.9
B.Sc. Biological sciences	9.0	3.5
B.Sc. Psychology	10	3.9
B.Sc. Biochemistry	10	3.9
Level (year)		
100 (1)	253	99
200 (2)	1.0	1.0
Religion		
Christianity	250	96
Islam	3.0	3.0
Buddhism	1.0	1.0
Total	254	100

With the exception of one student, the rest were level 100 (first year) students. Probably, the individual who stated that he or she was in level 200 could be taking the course for the second time probably as a result of failing the first time he/she took the class.

Participants understanding of “Green” with reference to the University of Cape Coast campus is provided in (Table 2) below. With the exception of 2 individuals who understood “Green as the color green, the remaining 99% of the participants had similar laudable ideas of what green should be. Most of the responses provided by the participants implied that for a campus to be green, “there is need for vegetation cover on campus” or “the need to plant trees for environmental purposes”, “as well as “planting trees for beautification”. As reported by Too and Bajracharya [18] the advent of social media technologies has vastly increased the awareness of green issues among several people. Other authors have stated that although several people know and are aware of the need to be sensitive to environmental issues, only a few reflect on this when it comes to certain behaviors including purchasing [19]. Following this, a holistic strategy has been recommended as necessary to help engage communities in sustainability practices.

Table 2. Participants understanding of a green campus

Statements	Frequency	Percent (%)
Planting trees for beautification	48	18.9
Planting trees for environmental purposes	64	25.2
Vegetation cover/Green grass	65	25.6
Better environment	26	10.2
Rich and well being of plants	24	9.5
Making the environment lively	25	9.8
Color green	2	0.8
Total	254	100

Majority of the responses provided by participants as their understanding of the term sustainability all boils down to ensuring efficient use of natural resources so that the natural environment will be maintained. It is interesting to note that about 25% of the participants each separately mentioned that sustainability is either the efficient use of resources or using natural resources and leaving some for the future

generation. Earlier on Dobson [20] identified three hundred definitions of sustainable development and sustainability and further stressed that the numbers have increased exponentially in the past ten years. It is thus not surprising that almost 20 years later after 1996 different definitions of the term sustainable development still come up. However, in this study, sustainable development is being looked at as the efficient use of natural resources and how this management can transcend into graduates acquiring jobs after completing their university education. As mentioned earlier, the possibility of including environmental education and sustainable development in a variety of subject areas in tertiary institutions has been recommended by the Canadian Sustainability Curriculum Review Initiative [11]. Other authors have stressed that changes in goals, attitudes, values and approaches concerning environment and development have significant implications for Human Resource Development and need to be incorporated in programs in the tertiary institutions [13].

Table 3. Participants understanding of sustainability

Statement	Frequency	Percent%
Maintain the natural environment	28	11.0
Improve the community	13	5.1
Efficient use of resources	64	25.2
Ability to keep and maintain something for a while	12	4.7
Ensure sustainability & prevent extinction	25	9.8
Maintain a good condition	12	4.7
Use natural resources efficiently & avoid negative effect on environment	20	7.9
Use natural resources & leave some for the future generation	65	25.6
Ensure continuous existence of natural resources	10	3.9
Sustain what we have	5	2.0
Total	254	100

Environmental issues have been identified as the greatest challenge to sustainable development especially in Africa where food security, poverty, disease, land degradation, deforestation among others have been environment related Pre-cop

Climate Change knowledge and Leadership Festival [17]. African University day celebrations for both 2006 and 2008, and the 12th General Conference held in Abuja, Nigeria in May 2009 were dedicated to the theme “Role of Higher Education in Promoting Sustainable Development in Africa”. The AAU’s program on “Achieving Sustainable Development” aims at ensuring that the continent’s higher education institutions continue to remain relevant to the continent’s developmental needs by developing innovative local strategies to entrench values, behaviors and lifestyles required for a sustainable future and for positive societal transformations. Africa’s stock of human resources is enormous and the potential to tap into this for accelerated development has been emphasized over the decades. The continent’s higher education institutions should not only mainstream education for sustainable development in their activities but should also ensure that the review of the learning materials reflect the latest scientific understanding of sustainable development.

Table 4. Participants response to whether UCC campus is green & sustainable

Statement	Frequency	Percent (%)
Is UCC campus green?		
Yes	184	72.4
No	70	27.6
Is there any relationship between green & sustainability?		
Yes	216	85
No	38	15
Total	254	100

A program introduced in Asia and the Pacific (NETTLAP) [1] is believed to enhance the environmental knowledge and skills of educators and trainers in tertiary institutions. The program has a large multiplier effect through benefits to graduates, government, the private sector and the community at large. Probably, developing a program similar to the NETTLAP and introducing it to tertiary institutions in Ghana including the University of Cape Coast may enhance the environmental knowledge and skills of students. With recent challenges of graduate unemployment in Ghana, the need to increase the knowledge, skills and commitment of the people, and lay structures and systems in place may be vital. Also, recent trends in human

resource development in Ghana, examination of the efforts required to facilitate sustainable development, initiatives to environmental management need to be looked at critically. Education for sustainability often geared at sustainable future could also be looked at as one of the several concepts of education (UNESCO) Education for sustainable development in Action [14]. This Action plan identified curriculum reoriented to sustainability as knowledge, issues, skills, perspectives and values. Others have looked at it as active, relevant and interdisciplinary (UNESCO) ESDA Technical paper [21,14]. Since the students in this study were willing to accept and take environmental courses irrespective of the programs they are enrolled in, it is highly recommended that some environmental courses be added to programs at the university to empower upcoming graduates to be more employable.

Table 5. Participants views on addition of environmental issues to the curricular

Statement	Frequency	Percent %
Would you like environmental issues to be added to your curriculum?		
Yes	220	86.6
No	34	13.4
Would you like environmental issues to be added to the curricular for all programs?		
Yes	211	83.1
No	43	16.9
Total	254	100

4. CONCLUSION

Participants have a good idea of what greening is and other environmental issues but results from this study cannot conclude that the students are well versed in environmental education. Participants showed great interest in studying environmental issues should it be added to the curricular of the various programs they undertake at the University of Cape Coast. However, in order to include sustainable development in educational curriculum and instruction in an educationally defensible manner; the respective lecturers at the university must have enough conceptualization of sustainable development and process for systematic assimilation or else adopt approaches that are more like training.

CONSENT

The author declares that oral informed consent was obtained from the participants of the study prior to participating and they were informed that the results will be published purely for academic purposes.

ETHICAL APPROVAL

Although human subjects were involved, their consents were orally obtained and responses were kept confidential. There was no foreseeable risk to participants so the author did not find it necessary to obtain ethical approval from the University of Cape Coast review board. The study is not against the public interest.

COMPETING INTERESTS

Author has declared that no competing interests exist.

REFERENCES

1. Mckeown R. The ESD TOOLKIT 2.0. Web-Published Document. (Retrieved February 2015)
Available:<http://www.esdtoolkit.org/discussion/default.htm>
2. Anderson A, Morgan S. Sustainable development: A case for education. (Retrieved February, 2016)
Available:<http://www.environmentmagazine.org/Archives/Back%20Issues/2012/November-December%202012/sustainable-full.html>
3. Sachs I. Social sustainability and whole development: Exploring the dimensions of sustainable development. In Egon B, Thomas J, (Editors). Sustainability and the social sciences: A cross-disciplinary approach to integrating environmental considerations into theoretical reorientation, Zed Books, London; 1999.
4. Koning J. Social sustainability in a globalizing world. Context, theory and methodology explored. Paper prepared for the UNESCO/MOST meeting. The Hague, the Netherlands. 22 -23 November; 2001.
5. Thin N, Lockhart C, Yanon G. Conceptualizing socially sustainable development. A paper presented for DFID and the World Bank, DFICD, Mineo; 2002.
6. Littig B, Griebler E. Social sustainability: A catchword between political pragmatism and social theory. Journal of sustainability development. 2005;8(1-2):65-79.
7. Brundtland Report. Our Common Future: The World Commission for the Environment and Development. Madrid: Alianza Publication; 1987.
8. Adam WM. Green development (3rd edition)-environment and sustainability in a developing world. Routledge Taylor & Francis Group, New York, USA; 2009.
9. J, Fong S, Ho N, Isamura D, Jensen M, Shopland-Black L, Smith G, Vallis A, Yip S. Bringing the world into your classroom: Teacher action research for global education. Journal of Home Economics Education. 1996;34(2):25-31.
10. Canadian sustainability curriculum review initiative. Learning for a sustainable future: Rationale, context and scope. North York, Ontario, Canada; 2006.
Available: www.lsf-1st.ca
11. Savageau AE. Let's get personal: Making sustainability tangible to students. International Journal of Sustainability in Higher Education. 2013;14(1):15-24.
12. Hay JE, Oshima A, Lewis GDL. Capacity building for sustainable development in Asia. Asian Perspective. 1999;23(3):7-32.
13. Scott W, Gough S, (Eds.). Key issues in sustainable development and learning: A critical review. Routledge, London; 2004.
14. UNESCO EDUCATION FOR SUSTAINABLE DEVELOPMENT IN ACTION. Guidelines and recommendations for reorienting teacher education to address sustainability. Technical Paper No. 2, Paris, France; 2005.
15. Capra F. Development and sustainability. The Center for Ecoliteracy; 2007. Retrieved Dec. 2015.
Available:<http://www.ecoliteracy.org/publications/>
16. Pre-Cop Climate Change knowledge and Leadership Festival, November 15th; 2013.
17. Cheng VC. Trends in educational reform in the Asia Pacific Region. In Keeves JP, Watanabe R, (Eds). International handbook of educational research in the Asia- Pacific region. London: Kluwer.
18. Too L, Bajracharya B. Sustainable campus: engaging the community in sustainability. International Journal of Sustainability in Higher Education. 2015; 16(1):57-71.

19. DEFRA. The UK Government Sustainable Development Strategy, TSO; 2005.
20. Dobson. Environmental sustainabilities: An analysis and a typology. Environmental Politics. 1996;5(3):401-428.
21. UNESCO Education for Sustainable Development in Action. Technical Paper 4. Paris-France; 2007.
(Retrieved on December 2015)
Available: www.unesco.org/educationdesd

© 2016 Darkwa; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Peer-review history:
The peer review history for this paper can be accessed here:
<http://sciencedomain.org/review-history/14936>