

A House with Twenty-five Front Doors: Practical Teaching and Learning for Sustainable Development in Africa

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Challenge

The existing educational programs and structure of African universities were not designed to address the environmental and sustainability challenges now confronting the continent. They are rooted in a western, discipline-based higher educational model that is designed to produce graduates with expertise in established, standardized fields of study. The problem for Africa, as elsewhere, is that this is a product-focused, industrial age model. In it, the student is a product with knowledge in one, or sometimes a few fields of study. The education is designed to be taught by instructors with narrowly focused expertise.

In contrast, Education for Sustainable Development (ESD) is intended to catalyze people, building their capacity to imagine and work together for a different and better future. It is a contextual, holistic, community-based model for education. It is real education, since the word education comes from the Latin *e ducare*—to draw out or bring out. Successful ESD makes visible the needs of the community and brings out the talents of the people to address them. ESD considers the whole—the social, economic and environmental conditions, location, time and context. ESD does not replace discipline-based education. ESD and discipline-based education are complementary partners in the same way that the ability to see what is going on around you—ESD—provides valuable contextual information such as whether it would be safer to change paths while your focus is on walking on a path (discipline-based education).

In the near term, with the more than three hundred and fifty universities in Africa built upon the discipline-based model for education, the challenge for ESD, especially African ESD, is to design it to complement and integrate with, rather than replace, discipline-based education while it develops students' personal skills for adaptive, effective problem-solving.

Building SSA

In the late summer of 2005, a meeting with Akpezi Ogbuigwe, Head of the Environmental Education and Training Unit of the United Nations Environment Programme (UNEP/EET) began the conversation about how to develop an ESD course that could mainstream sustainability and environmental literacy and develop African students' problem-solving skills in a way that would be relevant to students in all faculties.

That was the beginning of the ESD course for Africa called *Sustainable Societies in Africa: Modules on Education for Sustainable Development*, or SSA.

Information Gathering

Information gathering began that fall and continued through the summer of 2007. Input was collected during multiple Mainstreaming Environment and Sustainability in Africa (MESA) University Partnership workshops. These workshops included more than one hundred professors, lecturers, and administrators from over sixty universities as well as representatives from the African Association of Universities (AAU), the United Nations Educational, Scientific and

Cultural Organization (UNESCO), the United Nations University (UNU) and the United Nations University/Global Virtual University (UNU/GVU). Additional workshops and meetings were held at Obafemi Awolowo University in Ile-Ife, Nigeria, Kwame Nkrumah University of Science and Technology in Kumasi, Ghana and the National Universities Commission here in Abuja, Nigeria.

Priorities that emerged were for a course that would:

- Introduce the concept of sustainability
- Introduce sustainability values
- Personally engage students in sustainability issues
- Introduce the full range of social, economic and environmental sustainability issues
- Encourage universities to engage with their communities about addressing local problems

Additional requirements included:

- Relevance to all African regions
- Relevance to students in any faculty
- Relevance for students whether in their first year of studies or at masters level
- Adequate guidance and support for instructors teaching the course
- Materials which could be incorporated into and complement existing disciplinary courses
- Bringing university research and development into the classroom

Developing the Draft

Production of the draft version of the course took place in the summer and fall of 2007.

The course was designed to be a combination of in-classroom and out-of-classroom student activities including discussions and presentations, readings about African sustainability problems and solutions, field visits, and student projects developed with and for their local communities.

Activities were sequenced and organized into parts, blocks and modules so that different elements of the course could be used alone or in combination to meet the requests for a course that could be used for the variety of academic levels and audiences identified above.

The mix of readings and activities were selected to engage students' heads, hearts and hands, recognizing that some students are most motivated to action based on what they come to understand, others by what they feel passionately about, and still others by what they can get out and do.

The "menu" of subjects explored in the course was organized using the list of the twenty-five most critical global sustainability challenges identified by the United Nations Commission on Sustainable Development (UNCSD). These subjects or issues include:

Agriculture, Biodiversity, Biotechnology, Climate, Consumption, Cultures, Decision Making, Education, Energy, Environmentally Sound Technologies, Finance, Forests, Health, Human Settlements, Justice and Peace, Land, Mountains, Oceans and Seas, Population, Poverty, Public Awareness, Trade, Transportation, Waste and Water, as well as the concept of sustainability.

Taken together, they provide the student with an introduction to the full breadth of social, economic and environmental sustainability challenges facing Africa. The course can be described as “a house with twenty-five front doors” because while each student may have one issue that they are primarily interested in or studying, the examination of any issue in the course leads one into discovering the connections that issue has to the others. By the time a student completes the course they are conversant in all the issues and understand their inter-relationships.

The great majority of the course readings were chosen from materials developed by United Nations agencies such as UNEP, the World Health Organization (WHO), the Food and Agriculture Organization (FAO), etc. in order to provide peer-reviewed materials of consistent quality and scholarship.

SSA also includes examples of sustainable practices—called Sustainability Strategies—and case studies that demonstrate ways in which the issues are being successfully addressed in Africa. Both come from a variety of sources in order to show students that appropriate solutions they can adapt or replicate for their own communities may come from anywhere and take many forms.

Since the array of subject matter covered in the course is so diverse, a one-sentence summary of each reading or example is provided to assist instructors so that they can quickly assess its relevance to their students. Instructors are also provided with lists of activities and questions that they can assign to their students to explore both inside and outside the classroom. An instructor’s guide provides the answers to the questions, suggestions on how to adapt the course for their particular locality to maximize local relevance and include indigenous knowledge and, most importantly, suggestions and explanations of how to conduct a student-centered course.

The size of the draft version totaled over 3000 pages of resources. It also included two video clips in its CD version. To make the course usable for the variety of audiences identified during the information gathering phase (i.e., a zero or one credit course for first year undergraduates, a three or four credit course for higher level undergraduates and a six credit version for graduate students), the course materials were assembled as a layered, progressively rigorous hierarchy of modules made up of folders.

A little over fifty pages can be used for a zero to one credit course that introduces the concept of sustainability. Blocks of seventy to one hundred and fifty pages are provided for examination of eight different thematic clusters of issues. As much as nine hundred pages can be used to support a rigorous three or four credit undergraduate course, while the total 3000 pages can be used to support a longer, high-level undergraduate or master’s level course.

Review

Review of the course draft began at the end of 2007 and continued into late spring of 2008.

The international review was coordinated by UNEP. It included representatives of the Association of African Universities, the Kenyan Organization of Environmental Education, the National Environmental Management Authority of Kenya, and the University of Nairobi among others. The review focused primarily on two aspects: pedagogy and content.

Principal comments regarding pedagogy included:

- Use student-centered learning pedagogy throughout the course
- Provide students with multiple opportunities for independent study and research
- Provide instructors more guidance about effectively facilitating student-centered learning

Principal comments regarding content included improving content navigation and increasing the number of readings about:

- Environmental governance
- Gender issues
- Indigenous knowledge
- Public engagement

Testing

At the same time that the draft version was being reviewed, it was being classroom tested.

During the spring semester of 2008, twenty-eight students in the Environmental Studies Program senior seminar at the University of Nebraska-Lincoln in the United States evaluated the draft. Since the seminar was only a one credit hour course, rather than all students doing all of the activities, readings and assignments, individual students worked in teams evaluating separate parts of the course.

Twenty were Environmental Studies majors with the following concentrations: Natural Resources – 12, Anthropology – 3, Biology – 2, Geography – 2, and Geology – 1. Eight other students came from a variety of other majors including: Agriculture – 2; Biology – 2; Art – 1; Civil Engineering – 1; Spanish language – 1; and Water Science – 1.

Four separate written assessment instruments combined with group oral interviews were used to document the students' evaluations. The assessment instruments took into account that the students taking the course were predominantly American rather than African. While the data obtained from evaluations should not be over-weighted due to the small sample size, the results provided useful information about improving course delivery and value. Results included the following:

Opinions about the course:

- How would you rate the content? Excellent 86%, Very Good 10%, Good 4%
- Was SSA of value to you? Yes 75%, No 7%, No Response 18%

- Would you enroll in a Sustainable Societies course? Yes 96%, No 4%
- Would you recommend this course to others? Yes 61%, No 7%, No Response 32%

Recommendations:

- In-class, make the course as involved and interactive as possible by utilizing real world experience such as outside speakers and experts, field trips, and in-class discussions related to the issues being studied
- Emphasize sustainability strategies, case studies, and the interrelationships between issues
- Emphasize experiential learning – if possible, 50% of class time devoted to outside experience and 50% for in-class discussions
- Have students visit and interview existing community sustainability projects before developing their own community sustainability project proposals

Findings:

- Students were virtually unanimous in preferring to keep the course led by students
- Most valuable aspects of the course (in descending order of value): the twenty-five issue modules and issue interrelationships; case studies; student independence
- 54% students found that investigating and visiting case studies (local projects) was the most rewarding activity in the course
- Based on the pre-course and post-course tests
 - All students learned a great deal about the interrelationships between sustainability issues that they previously had known little or nothing about
 - The major change in Environmental Studies majors was development of their problem-solving abilities
 - The major change in non-Environmental Studies majors was their learning more about sustainability and sustainability strategies
- Most students wanted continued access to the course materials after completion of the course

Final Version

The final version of SSA was completed during the summer and fall of 2008. All pedagogical and content comments received during the review phase were incorporated. Likewise, the recommendations from the in-classroom testing were incorporated into the final version.

Since neither the review nor the testing had proposed deletion of any course activities or materials provided in the draft, the additions—primarily from the content review—increased the total size of the resources provided in the course to the equivalent of over 4000 pages. The assembly of the course in its layered hierarchy allowed these content additions to be made by adding materials to existing folders within existing course modules, leaving the course structure and sequence unchanged.

Course Structure

The *Sustainable Societies – Africa* course consists of four Parts supported by Supplemental Materials. The sequence of the Parts leads students through four stages of development: recognition; understanding; integration; and application.

The objective of Part 1 is to connect students with sustainability. Each student has experienced sustainability problems personally or seen them in his or her community. In Part 1, students discuss these experiences.

Through discussions of their communities' problems, the students learn to *recognize* the wide range of social, economic and environmental sustainability problems in Africa and how the problems impact them personally.

Once this recognition has taken place, Part 1 explores the concept of sustainability and the rationale for sustainable development. Part 1 activities then explore the merits of sustainable development from a variety of African perspectives.

At the end of Part 1, the purpose and expectations for the students' Part 4 community application projects are explained so that during Parts 2 and 3 of the course, students are able to use and adapt the material in these parts to help develop their community sustainability strategy.

The objective of Part 2 is for students to develop practical sustainability issue *understanding*. Building on the personal recognition that takes place in Part 1, in Part 2, students examine each of the twenty-five most critical social, economic and environmental sustainability issues facing Africa—many of which they had personally identified as problems in Part 1.

In addition to learning more about the problems through assigned readings, the students explore and learn to evaluate sustainability strategies being used in Africa to address the problems, either through examples provided in the course materials or site-visits. Through critical-thinking exercises such as considering whether such strategies could be applicable to problems in their communities, students begin the process of applying what they are learning.

Also during Part 2, students select which community issue or issues they would like to design a strategy for as their Part 4 community application project and begin their personal research, assembling relevant issue and strategy information.

In Part 3, students move from understanding individual issues and evaluating strategies targeted to addressing one or several issues, to evaluating and critiquing a sophisticated strategy that is tackling many interrelated issues. The case involves multiple sustainability issues and

demonstrates how an integrated strategy to address the issues was developed and put into action. It also examines social, economic and environmental costs and benefits.

The objective of Part 3 is to develop students' understanding of how issues interrelate and strategy *integration*—how to build strategies that tackle multiple issues at the same time. This strengthens the students' ability to apply what they are learning and prepares them for their Part 4 community application projects, where they will integrate all that they have learned from Parts 1, 2 and 3.

In Part 4, students integrate their *recognition* that sustainability issues impact their communities from Part 1, their *understanding* of the issues and strategies to tackle them from Part 2, and their appreciation of the effectiveness of strategy *integration* from Part 3, and *apply* what they have learned by designing sustainability strategies for use in their communities.

The objective of Part 4 is student *application*. Each student, or student group, develops and presents a practical sustainability strategy for their community.

The Supplemental Materials include tools that support the activities in the four Parts. Students begin using these tools in Part 1. Using the Student Matrix Tracking Sheet in Part 1 provides students with a means of recording the various sustainability issues that their classmates regard as most critical.

The Issue Notes Template provides students with an organized way to continuously record and expand their notes on issues and appropriate strategies during Part 2 and prepare for the Final Examination in Part 4. It also serves as a tool for organizing issue and strategy information for their Part 4 community application projects.

The Sustainability Strategy Analysis and Application Sheet is used in Parts 2, 3 and 4. In Part 2, it works as a tool for diagramming and assessing the strengths, weaknesses, and applicability of sustainability strategies contained in the course, and for outlining student Part 4 project proposals. In Part 3, it helps students diagram and assess the merits of the Part 3 Case Study. In Part 4, the sheet is used by students and community members to assess the viability of the proposed community sustainability strategies that students present.

Student-centered Learning

As important as the content provided in SSA is the learning pedagogy used in the course. Recognizing the need to develop students who can solve problems independently and think creatively, SSA uses a learner-centered pedagogy.

In SSA, the student has primary responsibility for the learning process with the instructor serving as the facilitator of that process. This approach emphasizes application of what is learned and student initiative in all four parts of the course. The course is designed around the activities of

the student and not the activities of the instructor. The student is expected to be an active learner both inside and outside the classroom.

In the classroom, the majority of the class time is spent in student discussions, presentations and student assessments of the presentations. During class, it is the students who are expected to contribute the majority of information, not the instructors.

Three objectives of the course are to develop students' analytical, critical-thinking and leadership skills. With these objectives in mind, most of the activities in the classroom are designed so that students are responsible for both the quality of information presented in the discussions and for leadership in most of the activities. Leadership opportunities increase as the course progresses, building students' confidence and skill.

Outside the classroom, students are expected to build their research skills by exploring the Part 2 issue materials and sustainability strategies on their own and supplementing course information by seeking out external information sources. Out-of-class assignments, and especially the final student project, reinforce this approach. Meanwhile, Part 2 provides more information about each of the issues than a student could digest during the course. This is done in order to allow the student to explore subjects of personal interest at greater depth.

The instructor's role in this course is to be the students' guide and advisor. The instructor's purpose is to lead the student to his or her own deeper understanding of the information and bring out and develop the student's problem-solving and leadership skills.

After leading several activities early in the first part of the course, the instructor increasingly transfers leadership and responsibility for classroom discussions and presentations to the students.

Because of this role as guide and advisor, the instructor does not have to be an expert on all of the material examined in the course. Structured lesson plans and recommended activities provided in the Instructor's Manual are designed to assist the instructor in this role.

Summary

The existing educational programs and structure of African universities are not designed to address the environmental and sustainability challenges now confronting the continent. More than three hundred and fifty universities in Africa are built upon the discipline-based model of higher education. Therefore, one challenge for Education for Sustainable Development (ESD) is to rapidly provide ESD courses that complement existing discipline-based courses and develop students' personal skills for adaptive, effective problem-solving. Such courses will help "bridge the gap" while existing, discipline-based courses are re-designed to integrate ESD issues, themes and content.

Sustainable Societies in Africa: Modules on Education for Sustainable Development or *SSA* is one such complementary bridge ESD course that is ready for use in African universities.

SSA is the result of three years of research and development including input from throughout Africa, international review and classroom testing.

It introduces the concepts of sustainability and sustainable development and examines the twenty-five biggest social, economic and environmental sustainability issues facing Africa. *SSA* provides examples of the types of approaches that are being used to effectively address these challenges and develops students' abilities to design sustainable solutions for problems in their own communities.

SSA uses a learner-centered pedagogy. This approach empowers students to develop analytical, critical-thinking, and leadership skills while solving problems independently and creatively. The approach provides a learning environment where the student is an active learner both inside and outside the classroom and the instructor serves as the facilitator of that process.

SSA has a modular structure so that it can be used in parts or in its entirety, depending on the level of higher education at which it is used or the number of credit hours it is assigned. It is designed to be relevant to students in all faculties and is able to be locally-adapted for maximum effectiveness.

The *Sustainable Societies in Africa: Modules on Education for Sustainable Development* project is a part of the ten-year, Mainstreaming Environment and Sustainability into African Universities (MESA) Partnership initiative begun by UNEP and supported by the AAU and UNESCO.