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The interfaculty graduate environmental sciences program of the American University of Beirut: an ESD initiative in the Arab World

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Abstract The American University of Beirut's Interfaculty Graduate Environmental Sciences Program was launched in 1997 as a means of addressing salient issues on the environment and development in Lebanon and the Arab World using an interdisciplinary approach. The programme adopts a student-centred learning approach and aims to develop critical and systems thinking skills to produce socially and environmentally conscious leaders and agents of change in the Arab World. In this paper, we provide an evaluation of the programme's ESD dimensions using the criteria of interdisciplinarity, local relevance and competence-based learning. This is followed by a critical analysis of the programme's potential for use as a model in the Arab World. We find that, while the model may be useful in providing inspiration and a good practice case, its transfer "as is" to institutions of higher education in the Arab World or even in Lebanon is unlikely, and perhaps undesirable, in view of the inherently diverse nature of Arab universities.

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Résumé Programme inter-facultés de troisième cycle en sciences environnementales de l'Université américaine de Beyrouth : une initiative d'éducation au développement durable dans le monde arabe – Le programme interfacultaire de troisième cycle en sciences environnementales de l'Université américaine de Beyrouth a été lancé en 1997 comme un moyen de traiter au Liban et dans le monde arabe les questions centrales sur l'environnement et le développement à travers une démarche interdisciplinaire. Le programme adopte une approche d'apprentissage centré sur l'apprenant et vise à développer la pensée critique et systémique, en vue de former des leaders dotés d'une conscience sociale et environnementale ainsi que des acteurs du changement dans le monde arabe. Nous présentons dans cet article une évaluation des dimensions de l'éducation au développement durable contenues dans le programme, en appliquant les critères d'interdisciplinarité, d'applicabilité locale et d'apprentissage fondé sur la compétence. Nous poursuivons par une analyse critique du potentiel de ce programme à être utilisé comme modèle dans le monde arabe. Et nous constatons que, si ce modèle peut être utile en donnant une inspiration et en illustrant un cas pratique concluant, son transfert « tel quel » aux établissements d'enseignement supérieur dans le monde arabe ou même uniquement au Liban est improbable, et peut-être peu souhaitable, en raison de la diversité inhérente aux universités arabes.

Zusammenfassung Das Interfaculty Graduate Environmental Sciences Program der American University Beirut: Eine ESD-Initiative (Education for Sustainable Development) in der arabischen Welt – Das Interfaculty Graduate Environmental Sciences Program (Fakultätsübergreifendes Aufbaustudium Umweltwissenschaften) der Amerikanischen Universität Beirut wurde 1997 ins Leben gerufen, um evidente Umwelt- und Entwicklungsprobleme im Libanon und der arabischen Welt mithilfe eines interdisziplinären Ansatzes zu bekämpfen. Der Studiengang bedient sich eines studentenzentrierten Lernkonzepts und soll die Fähigkeit zu kritischem und systemischem Denken entwickeln, um gesellschaftskritische und umweltbewusste Führungskräfte und Akteure des Wandels in der arabischen Welt auszubilden. In diesem Aufsatz bewerten wir den Studiengang hinsichtlich ESD anhand der Kriterien Interdisziplinarität, Relevanz vor Ort und kompetenzbasiertes Lernen. Darauf folgt eine kritische Analyse, inwieweit der Studiengang in der arabischen Welt als Vorbild dienen kann. Wir stellen fest, dass das Modell zwar inspirieren und ein Beispiel für gute Vorgehensweisen geben kann, dass aber eine Eins-zu-eins-Übertragung auf Institutionen der höheren Bildung in der arabischen Welt oder gar im Libanon in Anbetracht der grundsätzlichen Andersartigkeit arabischer Universitäten unwahrscheinlich und vielleicht auch gar nicht wünschenswert ist.

Resumen El Programa Interfacultades para Ciencias Ambientales de la Universidad Americana de Beirut: una iniciativa de EDS en el mundo árabe – El

Programa Interfacultades para Ciencias Ambientales de la Universidad Americana de Beirut fue lanzado en 1997, con el fin de tratar temas sobresalientes del medio ambiente y del desarrollo en el Líbano y en el Mundo Árabe usando un enfoque interdisciplinario. El programa adopta un enfoque de aprendizaje centrado en el estudiante; su objetivo es desarrollar la capacidad de pensamiento crítico y sistémico, con el fin de producir líderes con conciencia social y medioambiental, y con ello un cambio en el Mundo Árabe. En este trabajo ofrecemos una evaluación de las dimensiones EDS de los programas, aplicando criterios de interdisciplinariedad, relevancia local y aprendizaje basado en competencias en la materia. Le sigue un análisis crítico del potencial que ofrece el programa para ser usado como modelo en el Mundo Árabe. Consideramos que, si bien el modelo puede ser útil sirviendo de inspiración o presentando un caso de buenas prácticas, su transferencia "tal cual es" a las instituciones de educación superior en el Mundo Árabe o incluso en el Líbano es improbable (y quizá, tampoco deseable) en vista de la diversidad inherente a las universidades árabes.

Резюме Межфакультетская выпускная программа по энвиронике Американского университета Бейрута: инициатива «образование для устойчивого развития» в арабском мире – Межфакультетская выпускная программа по энвиронике Американского университета Бейрута была запущена в 1997 году для исследования актуальных проблем по охране окружающей среды и развития в Ливане и арабском мире с помощью междисциплинарного подхода. Данная программа использует учебный подход с акцентом на учащемся и направлена на развитие навыков критического и системного мышления для подготовки социально и экологически ответственных руководителей и преобразователей перемен в арабском мире. В данной статье предлагается оценка масштаба образования для устойчивого развития в данной программе с использованием критериев междисциплинарности, локальной релевантности и обучения на основе компетенций. Далее следует критический анализ потенциала программы для ее использования в качестве модели в арабском мире. Авторы считают, что если эта модель может быть полезной, давать вдохновение и служить примером положительной практики, то ее использование «как таковой» в высших учебных заведениях в арабском мире или даже в Ливане вряд ли будет возможным, и, может быть, нежелательным, ввиду разнообразной по своей сути природы арабских университетов.

Introduction

Environment and sustainable development in the Arab World

Sustainable development in the Arab World is severely hindered by tremendous environmental challenges. The most important of these is water scarcity

(United Nations Development Programme 2009). Indeed, the region is one of the most water-scarce in the world, with 13 out of the 21 Arab countries falling within the category of countries with water shortages[1] or water scarcity. The situation is exacerbated by a stressed groundwater system resulting from unsustainable water extraction rates and to partial control over nearly half of the Arab World's surface water resources, which exposes the region to trans-boundary conflicts. Serious water pollution problems further decrease the availability and usability of water supply and threaten health and human security. Desertification is another major Arab environmental problem affecting 68.4% of the total land area of the region and threatens a further 20%, according to a recent United Nations study (United Nations Development Programme 2009).

Although better endowed in water resources than other Arab countries, Lebanon also faces major environmental problems. Civil and external conflicts since 1975, including a protracted civil war (1975–1991), an Israeli invasion (1982) and a recent Israeli onslaught (2006), have resulted in a devastating deterioration of natural resources. Environmental pollution is evident throughout the country. Decades of governmental neglect or inability have also led to serious depletion of natural resources and to advanced land degradation, especially on the highlands. In the urban zones, air pollution is a serious and growing concern. Along the littoral, marine pollution from untreated discharges is widespread.

The Arab region is predicted to be one of the areas hardest hit by climate change (United Nations Development Programme 2008). According to the United Nations Development Programme's Global Human Development Report 2007/2008, global warming may strongly affect Egypt, Lebanon and Sudan, as well as North African countries. In Lebanon, for instance, studies predict that an increase in temperature of 1.2°C will reduce available water by 15% by 2020. The implications on the ecological integrity as well as on the human and economic development of the region could be significant, especially given that the region is falling behind in achieving most of the Millennium Development Goals.

Since 2001, the League of Arab States has committed itself formally to developing a regional programme for sustainable development through the Council of Arab Ministers Responsible for the Environment and other specialised Ministerial Councils, and in cooperation with international, regional and Arab organisations. This commitment is laid down in the Ministerial Declaration on Sustainable Development issued in Cairo on 25 October 2001.

In Lebanon, the Lebanese Government started addressing the issue of environment and sustainable development from the early 1990s onwards; however, serious advances have yet to materialise. More recently, civil society action has gained in significance with the emergence of hundreds of non-governmental organisations focused on sustainability and environmental action.

[1] Per capita share of water below 1000–2000 m^3 per year according to the Water Poverty Index.

Education for sustainable development (ESD) in the Arab World

Education is a central tenet of sustainable development. However, education in the Arab World is mired by a plethora of problems. In a recent book provocatively entitled *What is Wrong with the Middle East*, Brian Whitaker describes education as a central problem for the Arab region. Basing his argument on information from the 2004 Arab Human Development Report, he concludes that teaching methods in the Arab World "do not permit free dialogue and active, exploratory learning and consequently do not open the doors to freedom of thought and criticism" (Whitaker 2009). According to the author, the dominant education systems in the Arab World do not encourage "critical thinking and analysis", both of which are essential components of education for sustainable development. Rather, they stifle creativity and strengthen the status quo. They also foster a "knowledge deficit" associated with stagnation in the field of scientific research, which hinders the development of much-needed technical and vocational skills (United Nations Development Programme 2003). In the words of the 2004 Arab Human Development Report:

> Communication in education is didactic, supported by set books containing indisputable texts in which knowledge is objectified so as to hold incontestable facts, and by an examination process that only tests memorization and factual recall (United Nations Development Programme 2004).

This deficit was echoed in the 2009 Arab Human Development Report which finds that one major regional limitation to sustainable development is "the quality and type of education generally provided, which does not stress technical or vocational skills in demand".

Education for sustainable development (ESD) is "a process of learning how to make decisions that consider the long-term future of the economy, ecology, and the equitable development of all communities" (UNESCO 2009a). The core values and aims of ESD were reaffirmed in the Bonn Declaration of April 2009, which included a call for action to developed and developing countries, civil society and international organisations to make significant efforts to strengthen and promote ESD as an essential step towards social and environmental justice and sustainable livelihoods (UNESCO 2009b).

Since the late 1990s, UNESCO has been actively encouraging the implementation of an ESD strategy in the Arab World (UNESCO 2008), the aim of which is to address the most salient environmental and human development issues, namely:

- poverty, unemployment and brain drain;
- agriculture and water scarcity;
- desertification and scarce water resources;
- health awareness;
- political security and demographic stability;
- environmental awareness;
- unsustainable consumption patterns;
- problems related to increased pollution; and
- biodiversity conservation.

Moreover, the strategy underscores the importance of targeting the key ESD themes of "critical reflective thinking" and "understanding complexity and systems thinking", while addressing "peace and human security, conflict resolution, biological diversity and climate change". While progress has been made in implementing part of the ESD strategy in the Arab World, the focus has primarily been placed on primary and secondary education, while ESD in higher education does not appear to have received the attention it deserves. This can perhaps be attributed to the specialised nature of university-level education, and to the often rigid nature of the administrative organisation of higher education establishments which are organised along disciplinary lines.

Many higher education institutions throughout the world have committed themselves to ESD. This commitment has been expressed by curricular changes to include sustainability, which have been carried out with varying degrees of success. In a recent report (Dawson 2008) on the inclusion of sustainability in the curriculum of higher education institutions, a UK group indicated that "there is evidence that most universities are embedding within existing modules across a wide variety of subject areas and some have developed bespoke modules for sustainability, either generic or within disciplines". The report further stated that institutions were found to be "variable in their approach to sustainability in the curriculum", and that while interdisciplinary teaching was found to be "an essential ingredient of ESD, it was not always easy to achieve".

Environmental programmes in universities can provide an excellent entry point for the implementation of an ESD agenda and the formation of cadres who can go onto become trainers, teachers, practitioners and policy advisors. However, it must be noted that environmental education cannot be considered as equivalent to ESD, in the same way that education in sustainable development is not synonymous with education for sustainable development. In order to be a significant contributor to Arab sustainable development, an educational programme must not only address the core Arab environmental problems. It must also tackle the salient issues facing Arab education and be aligned with the Arab ESD strategy laid down by UNESCO as it appears above. It must therefore:

- be interdisciplinary and holistic: programmes must address the three realms of sustainability—environment, society and economy—and develop critical and system thinking;
- be locally relevant: programmes must fit the environmental, social and economic conditions and goals of their communities, regions and nations; and
- adopt a competency-based approach to learning, in which knowledge is built by learners through experience and activities (UNESCO 2009a, b).

In the remainder of this article, we shall introduce an ESD initiative implemented by the American University of Beirut: the Interfaculty Graduate Environmental Sciences Programme. The programme was designed in the mid 1990s as a response to the need for sustainability expressed in the first Earth Summit in 1992, and has been implemented successfully since 1997. We will first describe the programme, its organisation and its achievements. We will then provide an evaluation of its ESD dimensions using the criteria of interdisciplinarity, local relevance and

competence-based learning. This will be followed by a critical analysis of the programme and its potential for use as a model in the Arab World.

IGESP, the interfaculty graduate environmental sciences program of the American University of Beirut

General description

IGESP was launched in 1997 in order to address the complex and interlocked environmental and sustainable development problems of Lebanon and the Arab region. Education at the American University of Beirut (AUB) is organised around six Faculties/School: the Faculty of Agricultural and Food Sciences (FAFS), the Faculty of Arts and Sciences (FAS), the Faculty of Engineering and Architecture (FEA), the Faculty of Health Sciences (FHS), the Faculty of Medicine (FM) and the Olayan School of Business (OSB). In a major departure from the conventional university administrative arrangements, IGESP does not belong to any of these faculties; it is managed by an Interfaculty Coordinating Committee in which all Faculties are represented. Members of the committee are appointed by the Deans of the various faculties and report to them. The programme director is appointed by the provost to whom s/he reports.

Full details of the programme requirements and structure can be found in the AUB catalogue at http://www.aub.edu.lb/registrar/Documents/catalogue-graduate 08-09/igesp.pdf. The most relevant details are summarised in the following section.

The programme leads to a Master of Sciences (MS) degree in Environmental Sciences with four possible majors: Environmental Technology, Ecosystem Management, Environmental Health and Environmental Policy Planning. Together, these majors ensure adequate coverage of all environmental and sustainable development issues prevailing in Lebanon and the Arab World, in their various ecological, economic and social dimensions. Like all programmes at the American University of Beirut, IGESP is registered in the US through the New York State Education Department.

For the sake of encouraging diversity, students are accepted into the programme from a variety of fields or institutions, provided they satisfy the basic curricular requirements in the natural and physical sciences or take course prerequisites as recommended by the advisory committee. However, the GPA remains the strongest selection criterion for selection at entry level, although work experience is increasingly recognised. Scholarships are often earmarked for students from the region in order to foster diversity.

Graduation requirements for the MS degree in Environmental Sciences are:

- completion of nine credits (9 courses) of core courses;
- completion of 15 credits (4 courses) of electives;
- completion of six credits equivalent to an MS thesis;
- attendance of the seminar in environmental sciences;
- maintaining a minimum cumulative average of 80 over 100;

- passing a comprehensive exam;
- passing a thesis defence; and
- satisfying university residency requirements (typically one year).

A non-thesis option is also available whereby the thesis is replaced by a three-credit applied project thesis, and a three-credit additional elective.

Graduate education up to MS level constitutes the bulk of IGESP's academic activities. However, the programme has been heavily involved in adult and continuing education through the implementation of a number of large-scale development research projects which have included training workshops on Environmental Impact Assessment, Strategic Environmental Assessment, the Cost of Environmental Degradation, Post Harvest Technology Transfer and capacity building in Environmental Health. These workshops target the local community, as well as members of the private sector.

The relevance of the IGESP curriculum to ESD lies in the fact that the mandatory core courses are selected from all disciplines offered by the programme. All students are therefore potentially exposed to the ecological, technological, policy and human health dimensions of environmental sciences, which entrenches interdisciplinarity into the curriculum. The holistic approach is further strengthened by the variety of elective courses, which expose students to the multiple facets of environmental and sustainable development, and can include courses in Environmental Economics as well as in Geographical Information Systems and Environmental Impact Assessment. Most of the courses include projects in which students carry out independent field work, including interviews and surveys, livelihood analyses, organisation and management activities, as well as laboratory analyses. These projects serve to enhance the students' independent thinking skills, and develop teamwork and leadership capacities. A capstone experience is offered in the MS thesis/project, where the students' educational experiences are tied together, and their independent research, analytical, communication and critical-thinking skills are tested. During their courses and their thesis, the students are encouraged to work in one of the programme's on-going development research projects. This approach enhances their competencies to include human dimensions and social sensitivity, which are not normally acquired in higher-level, disciplinary university education. Students are also closely involved in this non-formal education aspect of IGESP: they prepare training material based on the research in which they are involved, and can also be called upon to deliver workshops. This helps to hone their communication skills and their ability to translate research results into material relevant to real-life situations.

Achievements

The first batch of students graduated from the programme in the year 2000. By June 2009, 85 students had graduated from the programme. Over the same period, the programme accumulated over US $1,350,000 in interdisciplinary research and development grants and contracts. This has enabled the publication of over 300 articles, reports and training manuals during the past 10 years. Nearly half of these

are in internationally refereed journals. The projects typically address the multiple facets of sustainable development, including environment, livelihoods and policy. They involve interventions at the community level jointly conducted by faculty members and graduate students. They result in significant academic outcomes, such as PhD and MS theses, journal articles and conference presentations.

The programme strives to produce responsible graduates who can go onto become leaders and agents of change in the Arab region. In Lebanon, graduates of the programme have been pivotal in establishing the newly-created Ministry of the Environment. Aside from government, graduates have been recruited to top positions in private consulting firms, in international and UN organisations, as well as in the local non-profit sector. One of the programme graduates has founded an NGO (IndyACT) that has been extremely active in promoting the Arab Climate Campaign and was invited to the Copenhagen Summit in December 2009 to represent Lebanese civil society.

A number of students have found employment in the Arabian Gulf countries, where they hold key positions that influence sustainable development. One of them is currently a project manager in the Sustainable Development Unit's Policy and Strategy Department in the Executive Council of the Government of Dubai. Several students have also elected to pursue higher education abroad; many have received full scholarships in the US and Europe. Some have returned as faculty members for the programme.

Evaluation

Monitoring and evaluation are key components of the programme's activities. They serve to ensure the quality of the outcome and to assess its relevance. This is an important activity for all academic programmes, but more so for ESD programmes, due to the rapidly-changing nature of the external and internal conditions.

The programme is regularly subjected to five types of evaluations:

1. Internal evaluations conducted by the Interfaculty Coordinating Committee on a yearly basis during especially dedicated meetings.
2. Student evaluations conducted through an exit interview administered to graduating students. It is to be noted that programme courses are also routinely evaluated at the end of every term.
3. Administrative evaluations conducted yearly by the university provost.
4. End-user evaluations, in which feedback from the employers and academic supervisors of PhD students is collected. This activity takes place informally throughout the year.
5. External evaluations carried out by a recognised scholar from an independent university or academic centre. This is carried out every 5 years. The latest external evaluation took place in 2005 and was conducted by Professor Donna Mergler of the Institute for Environmental Sciences, *Universite´ du Quebec à Montre´al* (Canada). The next external evaluation is planned for 2010.

Frequent evaluations have resulted in a very dynamic programme in which the course structure, content and applied learning techniques are in constant evolution, as illustrated by the following examples.

The programme was initiated in 1997 with a total credit load of 36 semester credits, of which 18 were core courses (6 courses). Student exit interviews indicated that the load was excessively heavy and could hardly be completed in 2 years, which is the normal duration of studies. The programme was lightened in 2003, when the total credit load was reduced to 30 credits and the number of core courses to 4: Natural Resource Management (ENSC 630), Toxicology and Environmental Health Hazards (ENSC 640), International Environmental Policy (ENSC 650) and Environmental Technology (ENSC 660). An end-user evaluation in 2008 indicated that students would benefit from taking a broader range of electives in order to strengthen their holistic critical-thinking abilities. The number of mandatory core courses was reduced to three in 2009, and students are now invited to select from a list of courses representing three out of the four disciplines of the programme. The core courses for Environmental Technology are: Air Pollution Control I, Solid Waste Management I, Water and Wastewater Treatment I and Microbial Ecology, while the core courses for Ecosystem Management, Environmental Health and Environmental Policy Planning remain unchanged. This shift has opened the way for students to select one extra elective course from the broad array available in all faculties of the university.

The ESD dimensions of IGESP

Seen through the ESD lens, the programme clearly satisfies the criteria of interdisciplinarity, local relevance and competence-based learning.

Interdisciplinarity is one of the building blocks of the programme. IGESP was able to go beyond the rhetoric and initiate a viable and effective interdisciplinary model, at a time (in the mid 1990s) when the flaws of disciplinary education were starting to be exposed (Tansel 1994), but action had not yet been taken to palliate these educational deficiencies. In a paper published in 2004 (Semerjian et al. 2004), the programme leaders analyse the programme and show how IGESP translated the newly-emerging ideas of interdisciplinarity into coherent and structured training for graduate students. This came about as the result of an arduous intellectual process carried out by a group of faculty members and shared across all faculties. It represented a notable departure from the rigid university education approaches that prevailed in most of the world at the time, and which continue to hinder critical thinking in many of the educational institutions in the Arab World as well as in the developed countries. In the UK, for instance, Chalkley (2008, quoted in Dawson 2008) "identifies the institutional 'silo' as a key barrier to successful curricular integration", while Gough (2008) finds that limited human resources, institutional priorities and the different teaching approaches adopted by different faculties also limit interdisciplinarity in higher education in Europe.

The interfaculty programme structure developed in IGESP was crucial to its success, as it was based on integrating faculties rather than on separating totally

from them. While this required a large degree of agility in order to balance the traditional administrative structure which emphasises the roles of Department Chairpersons and Faculty Deans with the more fluid system required for the success of interdisciplinarity, this was possible due to the commitment of the university administration to interdisciplinarity, to the realisation of chairs and deans of the importance of the process, to the commitment of the programme leaders, and to the indisputable achievements of the programme.

The programme's focus on issues of local relevance has been one of its major strengths. This can be rapidly illustrated using two of the flagship projects of the programme.

The "Understanding Water, Understanding Health" project aimed at understanding the linkages between water, environment and the health of the population of Bebnine, a large rural town in one of the most deprived regions of Lebanon, Akkar. The project spanned a period of 4 years, during which research was coupled with development interventions aimed at demonstrating good practices in water quality management. The project also focused on the role of women in preventing water-borne illnesses. Five faculty members from Health Sciences, Agriculture, Engineering and Business were involved in its implementation. Students were an integral part of the project which resulted in five MS theses and eight publications. The students participated in the delivery of 10 community workshops.

The project entitled "A Participatory Approach towards Integrated Coastal Zone Management in Lebanon: Opportunities for Socio-Economic Growth and Environmental Protection" similarly offered a local focus and allowed for the integration of research, education and the involvement of student and faculty in community development activities. Implemented between 2002 and 2003, the project consisted of a series of community-oriented activities to increase and enhance community-based coastal management initiatives along the Lebanese coastline. A total of 12 faculty members from nearly all the university's faculties participated. The project involved a large number of students and resulted in the publication of one PhD thesis, two MS theses, 11 journal papers and three conference proceedings. Faculty and students contributed to the implementation of 15 community-based workshops. It is worth noting that one component of this project was the seed for the first project cited above, illustrating the continuity and sustainability of programme research activities and commitment amongst the programme leaders.

These are but a few examples cited here in order to illustrate the programme's ability to address issues of local relevance and frame them in the international context, thereby having an impact on the local scene through workshops and interventions and on the international scene through publications and dissemination in international outlets, journals or conference proceedings.

The projects also served to implement the programme's commitment to competency-based approach to learning, where knowledge is built by learners through experience and activities. The students' involvement at every stage of project implementation and their direct contact with the communities has contributed to enhancing their research, analytical, problem-solving and critical-thinking skills by emphasising the case-study approach to learning and solving problems.

Additionally, these projects act as an enabling framework between the university, local governments and the business sector. Examples abound and, in addition to those described above, also include the following:

- The Litani river basin management and development project.
- Capacity-building in the METAP region to tackle the cost of environmental degradation.
- The identification of the contribution and barriers of Renewable Energy Technologies (RETs) to poverty alleviation in the region.
- Sustainable waste management in rural areas.
- The development of tools and guidelines for the promotion of sustainable urban wastewater treatment and re-use in agricultural production in the Mediterranean countries.

As participants in research and training workshops, students frequently interact with local government and the business sector. Moreover, members of these sectors are also invited to join the graduate seminars as guest lecturers, where they can share their experiences.

The independent external evaluation of the programme confirms our analysis. Below is an excerpt from the evaluator's report (Mergler 2005) that has direct relevance to the positioning of IGESP as a model for higher education programmes for sustainable development:

> Applying interdisciplinary approach to specific areas is one of the strengths of the program since it avoids having students learn just a little bit about many things. This is one of the many challenges of interfaculty programs. The program leaders are well aware of the difficulties that balancing global approaches with specific expertise places on the curriculum.
>
> Fieldwork on specific regional problems is another strength of this program. This allows the students to put into practice the knowledge that they acquired within the program. This approach is likewise beneficial in creating links between the University and civil society. These links are bi-directional, on the one hand, allowing University students to integrate on-going projects on resolution of environmental problems faced by industry, government and communities, and on the hand, providing concrete examples for University professors and students to study.
>
> The program has demonstrated that it is feasible and is providing high quality training to the students. The objectives of the degree are not only appropriate but essential for providing well trained persons that can cope with and resolve the pressing environmental issues of our time, which require the capacity for inter-disciplinary team work.

Discussion and conclusion: a critical perspective

The call for sustainability is more pressing than ever in the countries of the Arab World. There is an urgent need for professionals who can address a number of

disciplines from engineering, the natural sciences, the humanities, economics and the legal/social sciences in order to understand the complexity of the world we live in. An epistemological shift is required in education, especially in the Arab World, from disciplinary silos to holistic and systemic thinking. In order to contribute to sustainable development, higher education programmes must produce graduates who are lifelong learners, whose knowledge encompasses technical proficiency, who are able to use knowledge in context, who can understand the societal, economic and environmental impact of their actions, and who are socially responsible. A majority of IGESP graduates satisfy these criteria.

IGESP's achievements were recognised and acknowledged when the programme was presented as a case study at the Ecohealth Forum, held in Montreal in June 2003 (Nuwayhid et al. 2004). The external evaluation of the programme (Mergler 2005) underscored its achievements, while also highlighting some areas which could be enhanced.

> This is a well-built program, that merits world-wide academic recognition. My only further recommendation would be to improve the transdisciplinary objectives of the program with more integrated team teaching for the core courses. Integrated team teaching would require the faculty to organise courses together around a theme and require all of the course instructors to be present at the same time (rather than one after the other) to animate the debate and demonstrate the synergy of examining an issue from several perspectives.

As a response, an integrated course in Environmental and Water Conflicts was developed, but has not yet been offered due to time constraints on all of the IGESP faculty.

The programme's success was due to a number of elements that were present simultaneously. These include:

- Commitment: AUB is committed to sustainability, and aims to promote social and environmental responsibility among faculty, students and staff. The university was an early signatory of the 1990 Talloires Declaration: University Presidents for a Sustainable Future. An effective cardboard and paper recycling programme has been operating for the past 10 years. The university is committed to sustainable agriculture in its 100-hectare farm, and to a significant reduction in its carbon footprint. For this purpose, an energy audit is currently in progress.
- Interdisciplinarity and social responsibility: These are central tenets of education at AUB. The university has consistently fostered innovations in education in the Arab region. Liberal education is an integral component of its programmes, as is student-centred learning and experiential learning.
- Programme management: This is overseen by an Interfaculty Coordinating Committee (ICC) and affords the programme a large degree of independence. It also contributes to cost saving, as the programme draws on existing faculty rather than hiring new staff.
- Human resources and capacity: The programme initiators are recognised leaders in their fields and able to collaborate, both professionally and personally, on teaching, research and services.

- Financial resources: The programme has been able to attract a large number of grants for the implementation of sustainable development projects. It has strengthened capacity-building for students and has succeeded in winning academic recognition through the publication of a large number of research papers.

However, the programme was unable to respond to the evaluator's recommendation to steer itself towards fully transdisciplinary education. The main reason for this lies in one of the very elements of its success: its organisational structure, in which faculty members involved in the programme are hired by individual faculties rather than by the programme itself, and therefore report to the line managers in their individual faculties. This reduces the incentive to engage fully in transdisciplinary courses, where the faculty's teaching effort may not be readily accounted for in their teaching loads. Attempts to resolve this issue have not yet met with success, as this requires a different form of course accounting for the whole university, as well as the pooling of teaching loads across different faculties.

Other challenges were faced at the level of the engagement and mobilisation of faculty members and administration, which was sometimes reflected in a "what's in it for me" attitude. However, the invitation of faculty members to participate in the large research and development project mentioned earlier served to catalyse their interest and strengthen their commitment. Moreover, the endorsement of the programme by the provost, the dedication of the people engaged in the programme and its academic success have played a key role in mobilising administration as well as faculty members.

Aside from offering inspiration and a good practice case, IGESP can provide a successful model for embracing ESD in many universities in the region, especially where the basic components of ESD—namely interdisciplinarity, local relevance and competence-based learning—have been adopted as core institutional values, as is the case with AUB. Additionally, IGESP has been nurtured within AUB by a supportive administration, a number of committed, like-minded faculty members who acted as programme coordinators with a predilection for out-of-the-box thinking, and a readiness to carry out continuous self-evaluation and to adapt to contextual changes. These conditions may not all be available in all higher education institutions, in view of their inherently diverse nature. However, the object here is not to provide a blueprint for direct transfer to other institutions. Locally relevant, indigenous programmes in higher education for sustainable development in the Arab World will need to emerge in response to perceived needs fostered by an adequate policy framework. What the IGESP experience teaches us is that sustainability may not readily be approached as an add-onto existing programmes. Its success lies in its alignment with institutional policy and strategy.

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