ABSTRACT

Despite the general recognition that urban development and climate change are interlinked in an intricate manner, universities and other educational institutions offering urban planning or urban development and management courses still tend to neglect climate change in their teaching due essentially to a lack of knowledge on climate change issues especially in the third world areas. Adapting cities to climate change will require a well-trained cadre of professionals who understand the implications of climate change for urban development. It will also require stronger partnerships to be developed with research institutions that can provide the necessary information to guide planning decisions and promote north south collaboration, research and knowledge transfer.

Our focus in this project is on the use of large scale computer networks (World Wide Web) to enhance and intensify the teaching and learning process in the area of climate change and the resilience of human settlements national and international level. Our aim is to unite groups of different ethnicity and cultural background engaged in similar learning processes in different locations by building a cyber (virtual) connection that bridges the geographical and cultural gap between them. In fact what this project creates is a single platform in cyberspace where we share knowledge and expertise with students design critics and advisers from different international geographical locations. In addition the program will establish an intercampus faculty group with representatives from each campus in order to promote interdisciplinary research and education to enhance and broaden the understanding of the complex consequences of climate change. Eventually we expect the program to develop core curricula for undergraduate and graduate studies and to develop recommendations for intercampus collaboration that would integrate climate change courses such as urban planning and environment, disaster management and urban planning, housing and sustainable development in addition to climate change vulnerability assessments, mitigation, adaptation and urban poverty reduction. If successful this experience could be then extended to other campuses throughout the world.

Field of Research: Education, Cyberspace, Climate Change.

1. Introduction

Despite the general recognition that urban development and climate change are interlinked in an intricate manner (Silva, Kernaghan & Andrés Luque 2012), universities and other educational
institutions offering urban planning or urban development and management courses still tend to neglect climate change in their teaching. Where it is being addressed, it is often done in an adhoc manner, limited to selected components of climate change adaptation or climate change mitigation in short-term programmes, seminars or non-mandatory courses.

Adapting cities to climate change will require a well-trained cadre of professionals who understand the implications of climate change for urban development. It will also require stronger partnerships to be developed with research institutions that can provide the necessary information to guide planning decisions. Many university lecturers have recognized the importance of climate change, as evidenced by their research interests and by the number of supervised Masters and PhD students working on climate change related research papers, yet this needs to be expanded into taught courses at both the undergraduate and postgraduate levels.

2. Challenges to global environmental sustainability

The world has urbanized. Over half of the world’s population now live in urban areas and 90 per cent of the growth is occurring in the developing world, with 70 per cent of the world’s population forecast to live in urban areas by 2050 (UN-Habitat, 2011). This situation has developed a number of global urban challenges including:

(1) Challenges to global environmental sustainability, including climate change and its implications for energy use, sustainable food and provision of fresh water.

(2) The impacts of rapid urbanization on biodiversity, natural resources and physical infrastructure.

(3) The demographic challenges of rapid urbanization, migration and changing population profiles.

(4) The challenges associated with formal and informal economies of urban areas, feeding urban populations and the urbanization of poverty, manifested in the increasing number of slum dwellers.

(5) Increasing socio-spatial challenges associated with the scale of urban areas.

(6) Institutional challenges relating to local and regional governance and the meaningful participation and effective representation of civil society.

Over the last few decades the world has seen a dramatic increase in the number of universities and tertiary institutions addressing urban challenges. The majority of the world’s universities are located in or close to cities and urban areas and engage in teaching, research and improving the accessibility of knowledge to and from the wider community. They create new knowledge and enhance understanding and help educate and train the next generation of urban practitioners in a range of disciplines. There is a recognized need by universities of the need to work collaboratively with all sectors to achieve workable solutions to urban sustainability and this involves interdisciplinarity.

Most universities face major challenges in ensuring that

- Their curricula are responding to the issues of urban sustainability.
The research is responding to the priority of sustainable urbanization and generating ideas to meet the challenges.

The knowledge and understanding generated in universities are made accessible to policy makers, practitioners and communities through proactive outreach services, ventures and partnerships.

It is then important for universities to develop new strategies for educating architects with forms of knowledge and practice beyond the reproduction of isolated ‘best practices’, towards broader strategies and means of implementing a multi-dimensional conception of urban sustainability.

3. Cyberspace a sustainable education tool

The present research aims to build a cyberspace for the departments of architecture and planning to more readily respond to the climatic threats the world faces (Climate change adaptation) and take bold steps in reducing cities’ climate footprint. One key output of the cyberspace initiative aims to have partner Universities and local universities adapting their teaching curricula and research to incorporate the issue of cities in climate change and exercise action-research and practical collaboration. It also aims at creating maximum linkages on activities relating to climate change and urban planning.

The project was initiated and endorsed by representatives of 5 departments of architecture in Algeria in related expert group meetings. The initiative aims to provide these departments with easily adaptable modules which can help integrating climate change into existing courses and which can be combined into a semester course. The modules will be made available on an interactive web platform where participating universities can subsequently upload their module adaptations, case studies and other open source files.

3.1 Project structure

The will to overcome the limitations of the traditional university teaching and the wish to investigate how collaboration can affect the redefinition of the design project will need a renewed approach and new strategies to promote the idea of an educational hypermedia system on the web (Simoff & Maher, 1997). Aimed at solving the theoretical and technical impasse typical of the present climate change challenges and to build coalitions of universities and to advance urban climate change education, the project will be based on three main concepts:

- Collective Inductive Learning: One of the web’s most common uses in teaching is distributing information to students: a technology substitution for handouts. It is also widely used as a resource for gathering information, supplementing the library. One of the greatest potentials for innovation in teaching with the web is collecting information from students, processing it, and reporting it back. This process creates a new kind of feedback mechanism that enables a class to participate in a collective effort, producing something larger than the sum of individual assignments (Brusilovsky, Eklund and Schwarz, 1998).

- Collective Review: Architectural and planning education has long recognized the benefits of collective review of student work, it is one of the fundamental principles of the jury review process. The public display and discussion of work is an important opportunity for students to learn both from critics and from each other in analyzing different approaches to a problem. The jury allows the instructor to categorize the various approaches and point out lessons that students can learn from one another. The web offers opportunities for
collective review of student work in a non-studio setting by digitizing samples of student work and compiling it into a web site that organizes the material, and interprets the overriding themes that emerge from the collective body of work.

- Collaborative Work: Through the web, today there is an advance in the student-teacher interaction process. There are also more avenues for collaborative work, which improves the communication between students and teacher. Students have access to expert guidance, desk criticism, consulting, counselling. Student-teacher interaction is enhanced further by advances in different modes of communication (Webinar, Facebook, Twitter, Desk remote access) and the huge exchange facilities offered by such networks: Files and media sharing, information transfer.

4. Project Implementation

The project we propose envisages a large cooperation and coordination between the participating universities through a web platform. The platform is organized into two virtual working spaces: the Design Area and the Analysis Area.

In the analysis area specially designed sessions would be deposited for downloading. A complete package for each session would contain: a lecture/power point presentation, supplementary lecture notes, a reading list, case studies, suggestions for studio/seminar work etc. Sessions could be combined to develop a complete semester (or term) course, which would form one course module of a post-graduate (or graduate) degree. The objective here would be to mainstream climate change into existing syllabi.

Urban planning and architectural design education is as diverse as the work of planners and architects (Wojtowicz, 1995). Planning courses and degrees are, for example, offered by planning and architecture schools or geography departments. Specializations exist for example in architecture, environmental design, housing urban planning, regional planning, or transport planning. It is therefore important that the various climate change impacts and responses are understood by the architects and planners. Specific modules should be then developed to ensure that for each specialization adequate modules are available to address a wide range of expected impacts.
climate change impacts. A total of six modules have identified and selected from the UN-Habitat Rotterdam Matrix (UN-Habitat, 2009), which should be the first ones to be elaborated and pilot-tested on the Web platform:

- Theory and Concepts of Climate Change and Cities.
- Practice of Urban Climate Change Adaptation and Mitigation.
- Planning for Climate Change.
- Climate Change and Urban Water Cycle Management.
- Climate Change and Energy & Transport.
- Climate Change and Shelter/Housing.

The modules are to be developed by at least three universities or partnerships of individuals from diverse institutions. The diversity in the partners should reflect varying climatic zones, different urban development challenges as well as different challenges to urban education. The partnership is to ensure that the module presents the state of the art in urban climate change knowledge and urban education and provides enough specificity (in terms of case studies for example).

The Design area allows students to access a "virtual class" where they can actively take part in the on-line courses. Through specific communication tools (e-mail, face-book, videoconference, webinars, etc.), students elaborate design solutions based on the information collected through the analysis area, as well as based on comments and reflections from other remote users, thus enabling cooperative study sessions tutored by remote experts. Students can be encouraged to work in teams to plan and develop a common task that, in this specific field, will consist of studies on the adaptation and mitigation plans/development plan from cities in their region/set case studies and investigations on how the concepts learned throughout the course are being applied/misapplied locally. Case Studies are needed for comparative analysis of cities in: different regions (developing vs. developed; geographical locations), different scenarios (climate regimes), different locations (coastal vs. inland), different scales (megacities vs. small island states).

A "shared blackboard" and a "virtual gallery" will be integrated into the "design area". These two cyberspaces will be useful for practically applying climate change concepts on strategic planning, urban and architectural design. By using these tools, students will have the opportunity to publish their projects in the "virtual gallery" and correct them through the "shared blackboard" in which teachers can graphically suggest corrections or design solutions: in this way, students have the

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Figure 2. UN Habitat Rotterdam Matrix

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opportunity to assess the progress of their own design activity, to reflect on their work and adjust it according to feedback from teachers, tutors and other students.

5. Conclusions

It is with the intention of expanding and enhancing international cultural interactions in the area of design and planning education with special emphasis on climate change that we plan to organize this pilot project in order to establish a cooperative learning and teaming between similar teaching programs at different geographical locations and cultural backgrounds. All partners are committed to addressing climate change impacts and are equally committed to sustainably strengthen urban education. This partnership hence aims to create significant synergies.

This virtual learning cyberspace will serve also as a catalyst for an expanded effort to formalize the use of the Internet as a collaborative design medium and broaden student access to international studies and cultural interaction on a global scale. Further more the increased reliance on cyberspace eliminates a traditional dimension of civic legibility and social discrimination in education. In addition cross cultural exposure is an effective means of not only learning about another culture, but also, in relation to various aspects of this culture, of understanding more closely about the participants themselves, their own culture, value systems, and the aims and processes of design and planning in their own society.

Bringing together urban climate change experts from universities around the world, this pilot project provides certainly a unique opportunity to assess the gaps and to identify good practices in urban climate change education.

References


