

eduGI Project - An International Network for GIScience Courses Exchange

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Abstract

Over the past few years we are witnessing a growing offer of GIS degrees on the part of higher education institutions. In spite the fact that many of these programs aim at similar purposes, in terms of learning and skills the students must acquire, the courses that integrate the diverse studies programs tend to have significant differences, both concerning contents and the focus given to GIScience central themes. The possibility to take advantage of those differences may contribute largely for the construction of more encompassing curricula, apt to respond adequately to the distinct needs and students expectations. In order to explore that possibility, eight European institutions are participating in an e-learning project that aims at the reusing and sharing of e-Learning courses in GIScience Education. After a brief presentation of the eduGI project objectives and approach, the main advantages and difficulties of developing this kind of initiative will then be discussed.

Introduction

In 2001, when the eduGI.NET – International Network for Education in Geographic Information Science - was assembled, coordinated by the University of Münster, an international cooperation process among higher education institutions connected with the GI Science education was initiated (Brox and Kuhn 2002). The eduGI.NET aimed at promoting a more efficient use of resources, ensure quality, and improve qualifications of university graduates. The success of the initiatives put in practice within the scope of the eduGI.NET consortium, led to the enlargement of this cooperation network to higher education institutions in Latin America - EduGI-LA-I and eduGI-LA-II *ALFA Programme* supported projects (Brox 2004; Brox 2005). Currently, and by taking advantage of the experience acquired in the last few years by the eduGI partners, eight European Universities (Fig. 1) are cooperating within the eduGI Project¹ - Reuse and Sharing of e-Learning Courses in GI

¹ EduGI Project Portal: <http://www.edugi.net/eduGI>

Science Education (Brox, Riedemann et al. 2006); financially supported by the *eLearning Programme*².



Fig. 1 - The eight eduGI partners

The eduGI Project – A GI European Virtual Campus

In 2003 the European Parliament (Commission of the European Communities 2003) adopted a multi-year programme (2004 to 2006) for the effective integration of information and communication technologies (ICT) in education and training systems in Europe (*eLearning Programme*). To achieve the Programme objective four action lines were established:

1. the promotion of digital literacy;
2. the strengthening of European virtual campuses;
3. the improvement of e-cooperation among organisations and practitioners in the educational and training systems, and,
4. the creation of transversal actions for the promotion of e-learning best practices in Europe.

² Project reference: eduGI – EAC/23/05 DE 011.

The purpose of the second action line was to add a virtual dimension to European co-operation in higher education, by encouraging European universities to develop new internet-based organisational models (virtual campuses) and efficient exchange and sharing schemes (virtual mobility). This action line was based on existing co-operation frameworks, such as the *Erasmus Programme*, assigning them an e-learning component. It is within this second line of action that, since February 2006, the eight eduGI partners are using existing GI courses and have adapted them to the requirements of the e-Learning course exchange.

Scope and Objectives of the EduGI Project

For the past few years we have been seeing a growing offer of GIS degrees on the part of European higher education institutions. In spite the fact that many of these study programs aim at similar purposes, in terms of learning and competencies the students must acquire, the courses that integrate the diverse *curricula* tends to present significant differences, both concerning contents and the focus given to GI Science central themes. The reason for that lies, in a decisive way, on the nature and course tradition of the institution offering the degree, as well as the cultural and background experience of teachers and practitioners in educational and training systems.

The maintenance or the justification for that situation can be obtained in the context of the creation of the *European Higher Education Area* (EHEA): in spite the fact that the Community should encourage the co-operation between Member States, "*the responsibility for the content of teaching and the organisation of education systems and their cultural and linguistic diversity, remains at national level*" (Articles 149 and 150 of the EU Treaty). However, and in a globalization context, to which the university structures tend to be particularly permeable (Delanty 2001), the possibility to share and explore different GI *curricula*, in order to achieve a *global GI curriculum*, may contribute to reach the ambitious goal of making "*the European Union the most competitive and dynamic knowledge-based economy in the world by 2010*" (European Council, Lisbon, March 2000).

Auspicious conditions for the sharing and exchange of courses and *curricula*, conceived and subordinated to different logics and disciplinary structures, are being created within the establishment of virtual communities and university networks, linked to each other by distance learning technologies. By contributing to the maintenance and valuation of curricular differences, these new organisational models and exchange/sharing schemes, may promote the constitution of a richer and encompassing *global curricula*, able to increase the international competitiveness of European higher education institutions, and the capability to develop student's critical, independent and high-order thinking skills, fostering their ability to learn independently (Life Long Learning).

In order to explore those advantages, the above mentioned eight European GI institutes are participating in the eduGI Project, which aims at the reusing and sharing of e-Learning courses in GI Science Education. The project idea is to (re)use existing resources by exchanging e-Learning courses via the internet with the purpose of improving:

- the quality of the teaching material;
- the access to international GI know-how and new topics that the receiving institutes could not offer to their students using their own resources;
- the virtual mobility of teachers and students across eight higher education institutions of seven European countries;
- the re-use of resources already invested in e-Learning (personnel and finances) by a good practice organizational model for sustainable and future-oriented exploitation;
- the Implementation of the Bologna Process by international cooperation of European GI institutes, based on the existing networks.

In this perspective, the added value of the project relies on two key innovation factors:

- The first key innovation factor is the opportunity to establish the bases for a European cooperation in GI Science education, in which the added value relies in implementing the Bologna process by a transfer of experience, knowledge, cultural issues, and English language skills across Europe.
- The second key innovation factor is an effective business model for e-Learning exchange and virtual mobility of teachers and students. The added value is not only in improving cost-effectiveness and quality in GI Science Education, but also by providing an exemplary model for other educational areas.

The eduGI Project Approach

The approach followed in the eduGI Project has tried to take advantage of the experience already achieved by the several eduGI partners, both at the study programs level and the e-Learning teaching. This “best-practice approach” has allowed the creation, in a short period of space, of the necessary conditions for the successful results of the project, specifically:

1. the establishment of the e-learning platform;
2. the definition of the organizational framework for courses exchange;
3. the online publication of e-Learning test versions courses for quality assurance purposes.

The technical coordination of the e-Learning platform was ensured by the ISEGI-UNL, which successfully provided an e-Learning Master Program in Geographic Information for more than five years (Painho, Peixoto et al. 2002; Painho, Peixoto et al. 2003). The platform allows the storage of different types of materials including full courses and other less formal teaching resources. A complete course in the platform can integrate the following items: explanatory text; main text; exercises; data; auto-evaluation questionnaires; project description; final exam, other materials including images and video, and a student discussion forum.

The organizational framework for the execution and recognition of the student's achievements was prepared by the cooperation of the eight eduGI partners, which agreed on providing each one with a course, to be taught on a non-profit exchange basis with the other eduGI partners. Table 1 provides an overview of the eduGI partners' provision and reception of e-Learning courses.

COURSE	Providing University	Receiving University							
		ITC	HUA	ISEGI	IFGI	UNI BW	UU	TUV	UWH
Visualisation	ITC								
Geographic Data Bases (Advanced)	HUA								
GeoSpatial Data Mining	ISEGI								
Project Management	IFGI								
GI Standards	UNI BW								
Virtual excursions in Earth Sciences	UU								
Data Quality	TUV								
Data Acquisition and Integration	UWH								

ITC - International Institute for Geo-Information Science and Earth Observation, Enschede, The Netherlands
HUA - Harokopio University Athens, Greece
ISEGI - Instituto Superior de Estatística e Gestão de Informação, Universidade Nova de Lisboa, Portugal
IFGI - Institute for Geoinformatic, University of Münster, Germany
UNI BW - BW University Munich, Munich, Germany
UU - Uppsala University, Department Earth Sciences Uppsala, Sweden
TUV - Department Geoinformation and Cartography, Technical University of Vienna, Austria
UWH - University of West Hungary, College of Geoinformatics

Table 1 – eduGI partners' provision and reception of e-Learning courses (Marked in yellow)

Once these two conditions were accomplished, it was possible to start the second stage of the project, which consisted in adapting existing GI courses to the requirements of the e-Learning course exchange. The feasibility evidenced by the e-Learning course exchange prototype - developed within the scope of the previous ALFA project eduGI.LA (www.eduGI.net/eduGI.LA/) – has suggested its application in this stage of the project.

Preliminary results of the experience of the ISEGI-UNL within the eduGI Project

For the last six years the Instituto Superior de Estatística e Gestão de Informação of the Universidade Nova de Lisboa (ISEGI-UNL), has been promoting and collaborating in the developing and implementation of a set of national and international projects connected to e-Learning. In 2002, together with the UNIGIS international Consortium, ISEGI-UNL conceived from scratch, the whole internet delivery master program in Geographic Information Systems and Science using online distance learning technologies. The absence of a previous e-Learning experience or practice, both by professors and students, didn't constitute an obstacle for the course development, nor did it compromise the student's expectations and final results. On the contrary, the innovative nature of the master program was efficient and easily absorbed, bringing forth successive curriculum innovation and renewal processes along the last six editions (Painho, Peixoto et al. 2003).

As a founding member of the eduGI.NET, the ISEGI-UNL has been participating, since 2001, in the set of initiatives pursued by this network of GI higher education institutions. Within the frame of the eduGI Project, the ISEGI-UNL has contributed actively for the fulfilment of the goals initially set; especially in those it took more responsibility:

- Access provision of project partners to the ISEGI-UNL e-Learning platform
- Technical staff maintenance and support during the ongoing of the project.
- Development, execution, and testing of the e-Learning course Geospatial Data Mining.

The Geospatial Data Mining course was taught, by Professor Fernando Bação, to students of three partner universities: International Institute for Geo-Information Science and Earth Observation (Enschede, The Netherlands); Institute for Geoinformatic from the University of Münster, (Germany) and the College of Geoinformatics from the University of West Hungary.

As a counterpart, the ISEGI-UNL students enrolled in the GIScience postgraduate and master programs have had the opportunity to attend the Project Management and GI

Standards³ courses, offered respectively, by the Institute for Geoinformatics of University of Münster and the Institute of Geoinformation and Land Development of the University of Bundeswehr, München.

So far the feedback from the students and teachers has been positive. The eleven students from the three partner institutions that have fulfilled the study plan proposed for the Geospatial Data Mining course, have concluded it with success and with an average score of 14,3 (out of 20). Similar results were registered in the GI Standards course, in which eleven students of ISEGI-UNL achieved the learning objectives initially established. However in both subjects many of the students enrolled didn't finished the proposed activities, which probably shows some of the limitations of the exchange courses organization model regarding the student's expectations. Of these we highlight:

- Difficulty in conciliating each course programmed activities with the school calendars of all the eduGI partner institutions;
- Students difficulty in adapting to new models and teaching methods:
- Awkwardness and difficulty in acknowledging the utility of the contents and teaching methods, in the context of the study programs in which the students are enrolled – in spite the initial curiosity and interest that motivated the enrolment in the subjects offered within eduGI.

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³ Still underway.

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