Continuing Professional Education via Distance Learning: Success Factors and Challenges

FIG International Workshop on Professional Education 2009
Vienna, 26 – 28 February 2009

Josef Strobl and Adrijana Car
UNIGIS Salzburg
Centre for Geoinformatics at Salzburg University
adrijana.car@sbg.ac.at

32 Trends that Affect Online Distance Learning

- Student/enrollment issues:
  (2) Students are shopping for courses that meet their schedules and circumstances.
  (3) Higher-education learner profiles, including online, information-age, and adult learners, are changing.

- Faculty issues:
  (16) Instruction is becoming more learner-centered, non-linear, and self-directed.

- Academic issues:
  (17) There is a growing emphasis on academic accountability.
  (18) Academic emphasis is shifting from course-completion to competency.

- Technology issues:
  (23) There is a huge growth in Internet usage.
  (24) Technological fluency is becoming a graduation requirement.

- Economic issues:
  (27) Lifelong learning is becoming a competitive necessity.

- Distance learning issues:
  (28) More courses, degrees, and universities are becoming available through distance-education programs.

(Howell et al. 2003) http://www.westga.edu/~distance/ojdla/fall63/howell63.html

Contents

- UNIGIS
  - Professional qualification
  - Curriculum development
  - Distance Learning
  - Quality Assurance
  - Assorted Challenges

UNIGIS International Association: Educating GIS Professionals Worldwide. Welcome. Windows Internet Explorer

Welcome to UNIGIS International

UNIGIS International Association (UIA) is the world’s premier distance education network offering programmes in Geographical Information Science and Systems (GISc).

It is an expanding network of higher education institutions dedicated to enhance the competence of GIS professionals like you!

- a worldwide network of educational institutions
- offers internationally recognized, academic, distance learning qualifications in GIScience and Systems
- professional certificates / diplomas
- postgraduate Masters degrees

UNIGIS International Association: Educating GIS Professionals Worldwide. Welcome. Windows Internet Explorer
Introduction: Targeted Audience

Professionals
- mostly working in GIS industry,
- interested in continuing education or
- pursuing an academic degree, and
- whose work and responsibilities require that
  their education be as free as possible
  from limitations of place and time

UNIGIS: Global Network

- First courses in 1993
- Founding members:
  - UK
  - Amsterdam
  - Salzburg
- Global network on (nearly)
  all continents
- Move into professional
  education

Dedicated to „lifelong learning“!

UNIGIS is the only sustained
international (online) distance education!

UNIGIS Professional Qualification

- …and its acceptance depend on factors like:
  - Curriculum and syllabus
    - Building awareness
    - Ability of identifying and structuring problems
  - Professional relevance and employability
  - Track record with alumni and in industry
    - Program’s reputation critical for sustaining success
  - Formal accreditation and quality indicators

UNIGIS: Curriculum Development

UNIGIS Program Structure

Compulsory modules
Electives
Collaborative project
International summer school
Master thesis

UNIGIS MSc(GIS)

UNIGIS professional
UNIGIS: Curriculum Development (2)

Recent/Current education projects at Z_GIS
- Herodot
- eNews
- UniPHORM – PHARE
- GeoBASE
- EMGIsc, EMGIsc-D
- SDiLA, LIME
- InterGIS, GISELA
- Tempus CARDS – GIST-CroHE

UNIGIS: Distance Learning

- Core factors for success of online distance learning:
  - Combination of advantages of centralized course delivery with regional access to support
  - Leveraging of novel Internet-based communication facilities to really 'stay in touch'
  - Balancing an accepted core set of knowledge & skills with flexible options to enable individual choices of elective subjects

UNIGIS: Distance Learning

- Our experience:
  - there is no one-size-fits-all model for organisation and delivery of postgraduate qualifications in GIS&T
  - Unique Selling Point:
    - Not distance learning per se but rather
    - Catering to the needs of a mature, well motivated and professionally active community of learners who are less mobile due to their job locations as well as social commitments

UNIGIS: Distance Learning

- Quality Assurance
  - ...is permanent challenge in academia
  - in a distributed set of programmes being taught across all boundaries of cultures, languages, professions and levels of economic development
  - UNIGIS Salzburg QA Policy Framework:
    - a common core curriculum referenced to established benchmarks, standards for teaching and performance assessment, and cross-programme checks
    - joint degrees,
    - credit transfer options
    - mutual evaluations
Assorted Challenges (1)

- Students with different background pose challenge to design of continuing education programs
  - Entry requirements
  - Assumed prior knowledge

Assorted Challenges (2)

\[ \sum \] >

Moving from \textit{centrifugal concept of knowledge dissemination} to \textit{collaborative vision of knowledge creation}

Assorted Challenges (3)

- Evolution of UNIGIS into truly global qualifications recognized by a wide range of industries and professions

UNIGIS Salzburg

- >>1000 students and alumni
  - In certificate and master courses
  - From German speaking areas
  - International programs
    - by our partners using our materials since 2004
    - offered since 05/2006 from Salzburg

=> Foundation for an important professional network and Leading GIScience education program
UNIGIS Salzburg: Principles

- Continuing education via online distance learning
  - *Where & When* at student convenience
- In-service learning
  - Alternative to full-time study
  - Some presence required
- Application oriented
  - Professional software
  - Cooperation with industry
- Academic qualification awarded by Salzburg University

Active Learning

- Continuous interaction and feedback
- Multimedia presentation and tools
- Problem- / Solution-oriented
- „Learning to learn“

Curriculum

- Conforming to academic course
- Modular structure
  - ~ 15 lessons
  - 4-7 assignments
  - ~6 ECTS credits
  - 120+ hours of student effort
- In part-time distance-learning mode:
  - ~8 weeks when taken in sequence

Modular structure: MSc(GIScience)

- Focus on conceptual, technical, and organisational aspects of GIScience and their application in various fields
- Qualification as a project, team or department leader
- 2 year postgraduate
- Structure
  - Compulsory modules
  - Electives
  - Collaborative project
  - International summer school
  - Master thesis
- Awarded academic degree: MSc(GIS)

Modular structure: UNIGIS professional

- designed to develop or improve application-oriented skills & provide an understanding of GIS
- 1 year professional
- Structure
  - 7 Modules
  - 1+ Elective or collaborative project
- Professional diploma certificate
Our Objectives

This European joint curriculum at advanced level (CDA) for GIScience is focused on the objective of a standardized, pan-European postgraduate qualification for professionals active in the field of Geographical Information. Beyond that, EuroMasterGI aims to be specifically competent in dealing with the European dimension of Geographical Information: this extends to European organisations, data sets, standards and issues as well as trans-national and multi-lingual projects.

EuroMasterGI brings academic institutions from many European countries together in offering a unified curriculum and a strong international perspective on GI. Based on institutional degree programmes the European Masters offer a specifically international and multi-disciplinary qualification recognising students' efforts for a wider European perspective.

Alumni are proficient in up-to-date Geomatics / Geographical Information Science as well as in a full range of Europe-wide issues, therefore being highly qualified for leading and active roles in agencies, enterprises and academia dealing with spatial and any kind of spatial information.

Contact: Prof. Josef Strobl
Director UNIGIS Salzburg

UNIGIS Environment

- Blackboard
  - eLearning platform
  - Learning Management System
- Backpack
  - Personalized learning environment
  - offline working environment
- Communication
  - Via Email, Blackboard (discussion boards, wiki,...)
  - Skype / GoogleTalk...
  - Tutor, Instructor, Team

UNIGIS Professional Qualification

Digital Earth Brainware

Requirements

CITIZENS

Participation

Applications

Domain expertise

ANALYSTS

Methods

Spatial Data Infrastructure

SYSTEMS

MGRS.

Info access

On completion of this module you should be able to:

- appreciate the reasons why the spatial perspective provides added value for decision
Qualifications Digital Earth Citizens can have (1)

- Citizens participate in society, make it work and contribute to livable spaces, sustainable economies and clean environments.
- C1 – ‘Consumer’ – map reading, orientation and navigation, finding one’s place and identifying a destination.
- C2 – ‘Prosumer’ – ability to participate by labelling a feature, mark up (‘redlining’) and rate a place or feature of interest and comment on alternative spatial scenarios, like a zoning proposal.
- C3 – ‘Producer’ – contribute one’s own data like a GPS-recorded hiking track, a geocoded photograph and perhaps even a draft proposal map for a conservation measure.

Qualifications Digital Earth Citizens can have (2)

- Analysts frequently are domain experts understanding WHAT needs to be done, as well as the HOW to do it, providing critical subject matter and methodological knowledge.
- A1 – ‘Applying tools’ by competently using existing functionality to answer simple questions and fulfil single-step tasks.
- A2 – ‘Design analytical workflows’ by creatively using established methods and existing functionality to solve complex problems requiring multiple transformations and operations.
- A3 – ‘Develop methods’ for new problems or conceptualise new solutions or complex workflows, and implement them for general use.

Qualifications Digital Earth Citizens can have (3)

- Systems experts supply a working infrastructure; essentially geo-enabling the information society through a spatial data/information infrastructure.
  - S1 – ‘System setup’ and maintenance for out-of-the-box installation of well-documented system components.
  - S2 – ‘Architecture design’ – competence to orchestrate multiple components, set up complex interfaces and profiles and link to external services.
  - S3 – ‘Server / service development’ – implement specifications and design and develop new services.

Qualifications Digital Earth Citizens can have (4)

- G/R – Competence in establishing, using and transforming Spatial Reference Systems (SRS), ‘measuring space’ and advanced geocoding. This geodetic / surveying engineering qualification is an essential prerequisite for setting up DE frameworks and to guarantee high quality operations.
- T/A – ‘Technician qualification mostly for data acquisition and data conversion. As a profession this can be implemented from a vocational angle, or in other cases from a technolo-gist or sensor specialist viewpoint.
- P/M – ‘Project management and organisation is a generic skill and frequently implemented as a standalone (e.g. consulting) career path, critically important to cover business per-spectives and for managing complex projects and imple-men-tations.'
**Benchmarking qualification**

<table>
<thead>
<tr>
<th>C</th>
<th>C1 Consumer</th>
<th>C2 Prosumer</th>
<th>C3 Producer</th>
<th>G/R</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>A1 Applying tools</td>
<td>A2 Design anal. workflows</td>
<td>A3 Develop methods</td>
<td>T/A</td>
</tr>
<tr>
<td>S</td>
<td>S1 System setup</td>
<td>S2 Architecture design</td>
<td>S3 Server/service development</td>
<td>P/M</td>
</tr>
</tbody>
</table>

**Tech programme**

<table>
<thead>
<tr>
<th>C</th>
<th>C1</th>
<th>C2</th>
<th>C3</th>
<th>G/R</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>A1</td>
<td>A2</td>
<td>A3</td>
<td>T/A</td>
</tr>
<tr>
<td>S</td>
<td>S1</td>
<td>S2</td>
<td>S3</td>
<td>P/M</td>
</tr>
</tbody>
</table>

**Why Quality Assurance (QA) for UNIGIS?**

- Emphasize **“customer” (student) orientation and satisfaction**
- Aspire to **high-quality products**
  
  Where UNIGIS is on it, there is UNIGIS in it!
- Aim at **accreditation** of current and future courses at national / international level
- Introduce **QA as a part of common denominator for UNIGIS International Association**
Towards a UNIGIS QA Concept: Preliminary Results (3)

UNIGIS Common Core Curriculum vs UCGIS Body of Knowledge

<table>
<thead>
<tr>
<th>UCGIS BoK – Knowledge Areas</th>
<th>CCC – compulsory modules</th>
</tr>
</thead>
<tbody>
<tr>
<td>AM. Analytical Methods</td>
<td>M1. GIS Introduction</td>
</tr>
<tr>
<td>CF. Conceptual Foundations</td>
<td>M2. Data Modelling and Data Structures</td>
</tr>
<tr>
<td>CV. Cartography and Visualisation</td>
<td>M3. Data Sources and Data Acquisition</td>
</tr>
<tr>
<td>DA. Design Aspects</td>
<td>M4. geoDBMS</td>
</tr>
<tr>
<td>DM. Data Modelling</td>
<td>M5. Spatial Statistics</td>
</tr>
<tr>
<td>DN. Data Manipulation</td>
<td>M6. OpenGIS and Distributed GI Infrastructures</td>
</tr>
<tr>
<td>GC. Geocomputation</td>
<td>M7. Geographical Analysis</td>
</tr>
<tr>
<td>GD. Geospatial Data</td>
<td>M8. Visualisation and Cartography</td>
</tr>
<tr>
<td>GS. GIS&amp;T and Society</td>
<td>M9. GIS Organisation and Project Management</td>
</tr>
<tr>
<td>OI. Organisational and Institutional Aspects</td>
<td></td>
</tr>
</tbody>
</table>

Basic structure of the UCGIS BoK and CCC

Summary

- So far we have established **foundations for a framework of thinking** and in turn for a **QA concept** and in a way sketched a respective **workflow**
- Parallel to these activities, an exploratory investigation has already been conducted to find out what already exists and can be used in our QA project

Future Work

- If successful, the emerging QA concept is expected to become a **QA policy for UNGIS@Salzburg**
- Furthermore we expect it to become **interesting to other UNIGIS partners** so they will support its development and introduction at their own site.
- The success of it certainly requires mutual respect for multicultural HE environments, and we strive for the least common denominator.