Worldwide Learning Infrastructure

FIG Congress 2010: Facing the Challenges – Building the Capacity
Sydney, Australia, 11-16 April 2010

Bela Markus
Land and Geoinformation Knowledge Centre
Faculty of Geoinformatics, University of West Hungary

Chair, FIG Commission 2 - Professional education

Approach

Worldwide Learning

Lessons learned during the last Commission 2 events

- **Learning Infrastructure**

FIG Commission 2 - Events

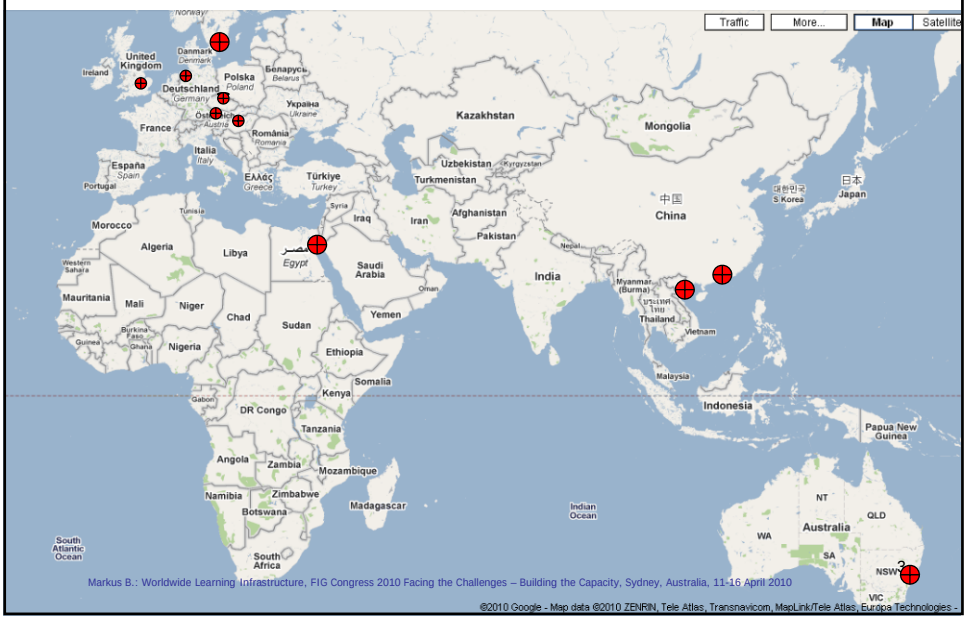
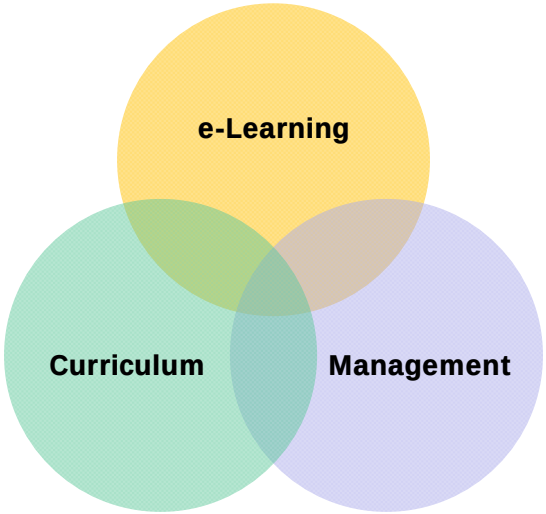


FIG Commission 2 (2007 – 2010)

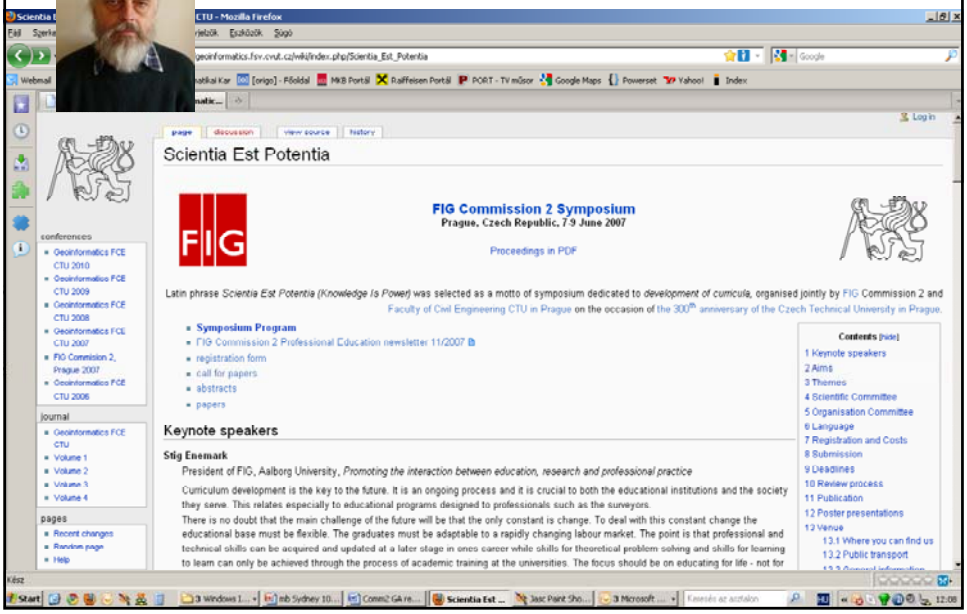


Workgroup 2.1: Curricula development

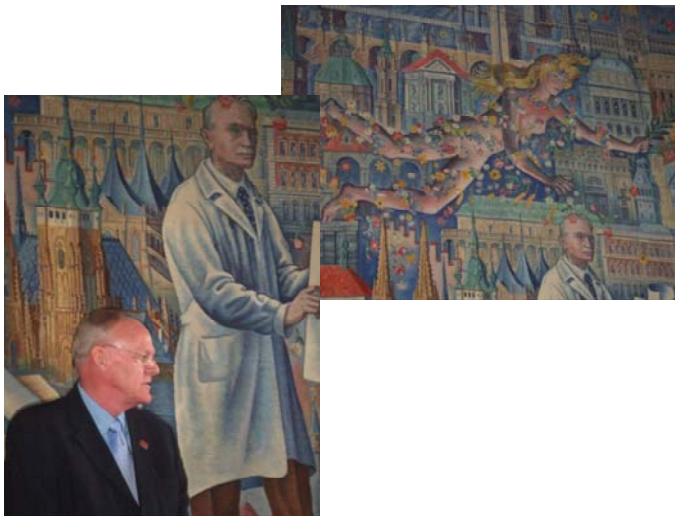
Chair: Bela Markus (Hungary)

- **Changing profession**
  - **Surveying, Cadastre**
  - **Land Management**
  - **Participatory planning - GIS**
  - **Real Estate Management**
- **Teaching methods**
  - **PBL**
- **Bologna changes**
  - **BSc / MSc / PhD / Professional masters**
- **Quality Management**
  - **Accreditation**
  - **Recognition**

Knowledge Is Power



„I suggest that we fly high and keep our feet on the ground at the same time."



Core Curriculum?

or Body of Knowledge

Ann B. Johnson

Higher Education Solutions Manager (ESRI): Meeting the Challenge - Incorporating New Technologies and Methods into a Curriculum for Surveying

Core Curriculum?

Greenfeld, J – Potts, L. (2007):
Surveying Body of Knowledge – Preparing Surveyors for the 21st Century. North American Surveying Educators Conference, Big Rapids, MI, USA.

The 21st Century surveyor must demonstrate

1. an ability to apply knowledge of mathematics, science and engineering / applied science / technology.
2. an ability to design and conduct experiments, as well as analyze and interpret data.
3. an ability to design a system, component, or process to meet desired needs.
4. an ability to function on multi-disciplinary teams.
5. an ability to identify, formulate and solve surveying (engineering) problems.
6. an understanding of professional and ethical responsibility.
7. an ability to communicate effectively.
8. a broad education necessary to understand the impact of surveying (engineering) solutions in a global and societal context.

The 21st Century surveyor must demonstrate

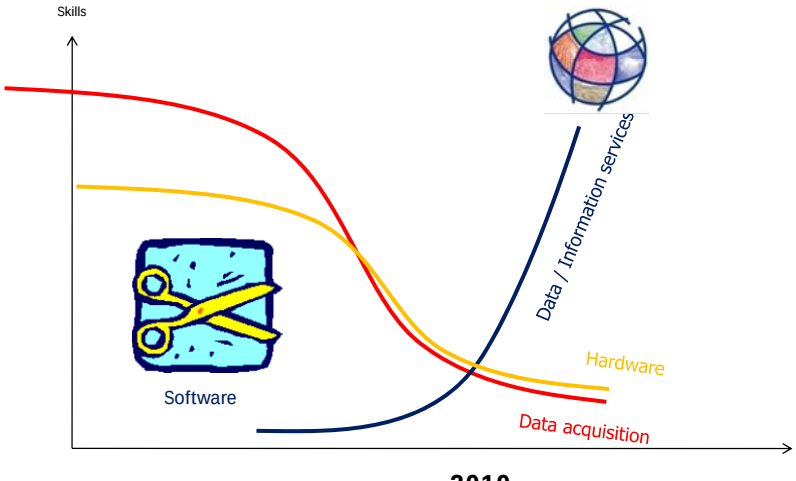
9. a recognition of the need for, and an ability to engage in, life-long learning.
10. a knowledge of contemporary issues.
11. an ability to use the techniques, skills, and modern surveying (engineering) tools necessary for practice.
12. an ability to apply knowledge in a specialized area related to surveying.
13. an understanding of the elements of supervision and project management.
14. an understanding of business and public policy and administration fundamentals.
15. an understanding of the role of the leader and leadership principles.

Core Curriculum?

Mr. Rob Mahoney and Prof. Frances Plimmer (United Kingdom), Prof. John Hannah (New Zealand) and Mr. James Kavanagh (United Kingdom):
Where Are We Heading? The Crisis in Surveying Education and a Changing Profession. FIG WW 2007, Hong Kong.

„ ... the number of competencies in which surveyors might claim to be proficient now number over 200”

New competencies

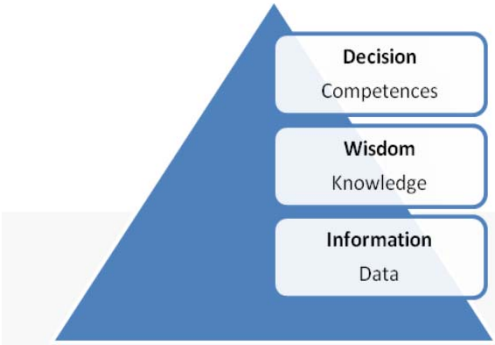


Based on: Mr. Rob Mahoney and Prof. Frances Plimmer (United Kingdom), Prof. John Hannah (New Zealand) and Mr. James Kavanagh (United Kingdom): Where Are We Heading? The Crisis in Surveying Education and a Changing Profession , FIG WW 2007, Hong Kong.

Core Curriculum?

Core competences

Competence pyramid



Workgroup 2.2: e-Learning

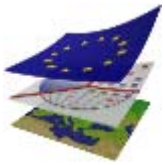
Chair: Liza Groenendijk, ITC (Enschede, Netherlands)

- Tools
- Innovations
- Portals
- Content development
  - Multimedia
  - CBT
  - Quiz
- Student support
  - Club
  - Library
- Communication
- Teamwork
- Metadata

e-Learning

Using Computers in Learning

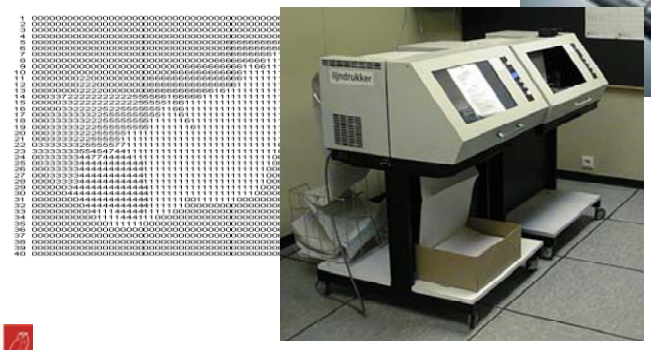
ICT in education



Information Technology	Surveying, Geomatics	Professional Education
•10-15 years from open systems to Internet	•10-15 years from digital maps to databases	•10-15 years from hypertext to knowledge bases

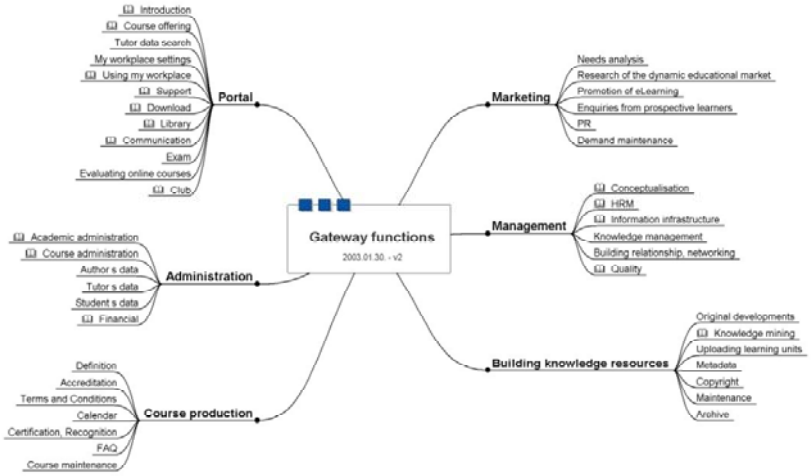
SDI – SII – SKI

Change your mind

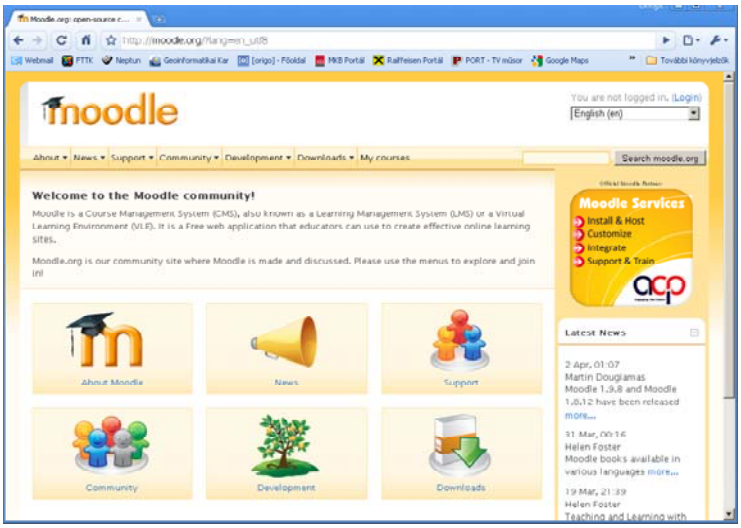


ContentMS – AdminIS – MIS ...

e-Learning Infrastructure



Open Course Management System



Raymond Kurzweil (99): The Age of Spiritual Machines

2014

„Fifteen years in the future computers will enable the memory capacity and computational ability of the human brain, and interaction with computers will involve gestures and two way spoken communications. Most learning will be conducted through software-based teachers."

2024

„Twenty five years from now computers will have the capacity of 1.000 human brains, and the majority of communication does not involve a human. Computers will have read all available human- and machine-generated literature and will be learning on their own. Machines will claim to be conscious."

Web 3.0

The Semantic Web is an evolving development of the World Wide Web in which the meaning (semantics) of information and services on the web is defined, making it possible for the web to "understand" and satisfy the requests of people and machines to use the web content.

It derives from World Wide Web Consortium director Sir Tim Berners-Lee's vision (2006) of the Web as a universal medium for data, information, and knowledge exchange.

Source: Wikipedia

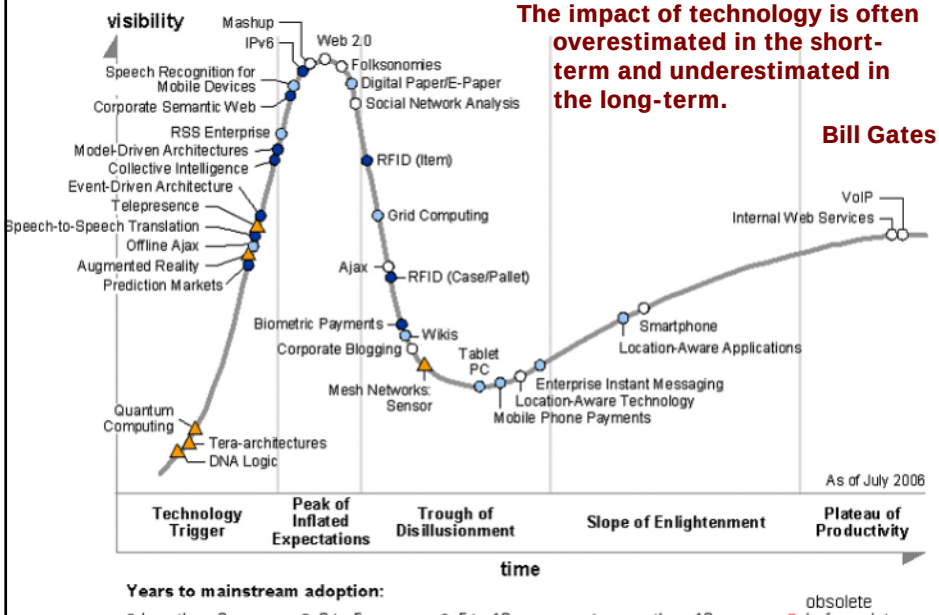
eLearning 2.0

	eLearning 1.0	eLearning 1.3	eLearning 2.0
Main Components	Courseware, LMS, authoring tool	Reference hybrids, LCMS, discussion groups	Wiki, Social Networking & Bookmarking, Add-ins, Mash-ups
Ownership	Top-down, one-way	Top-down, collaborative	Bottom-up, learner-driven, peer learning
Development time	Long	Rapid	None
Content Size	60 minutes	15 minutes	1 minute
Access time	Prior to work	In between work	During work
Delivery	At one time	In many pieces	When you need it
Content Access	LMS	Email	Search, RSS feed
Driver	ID	Learner	Worker
Content creator	ID	SME	User
Training's Role	Gourmet Chef	Short-order cook	Food critic

http://elearningtech.blogspot.com/2006/09/elearning-10-vs-20-help-needed_07.html

The impact of technology is often overestimated in the short-term and underestimated in the long-term.

Bill Gates



SWOT analysis

S	W
World-wide network (AM) Missioners, experiences (e.g. Enschede workshop) eLearning recognized by FIG SDI for everyday use (environment) Workplace learning CPD recognized Commission 2 is a central body for all surveying knowledge and developments	Communication IT infrastructure in several countries Differences in legal/institutional background Business model Members from developing countries under-represented
O	**T**
Videoconferences FIG Foundation Partner organizations (ISPRS...) Knowledge management Knowledge society Awareness building Land registration gaps in developing countries Online cooperation	Missing strategic will at university level Lack of lecturer's didactic skills Weak quality assurance online/distance courses Online/distance course development time demanding

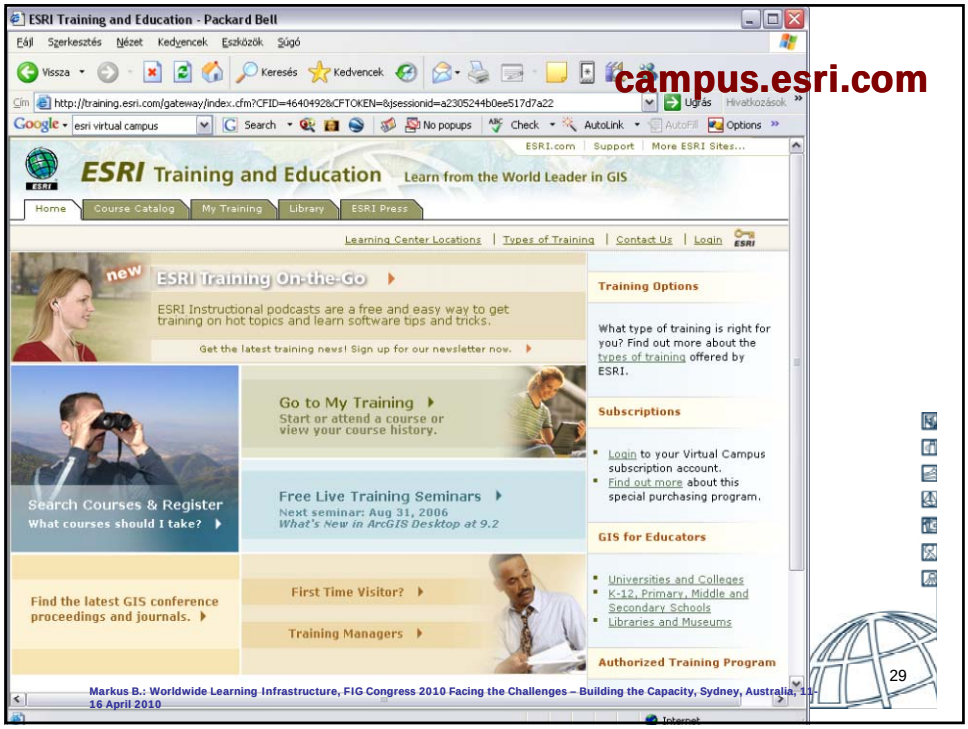
2010

FIG REPORT

FIG PUBLICATION NO 46

Enhancing Surveying Education through e-Learning

A publication of FIG Commission 2 – Professional Education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Next seminar: Aug 31, 2006
What's New in ArcGIS Desktop at 9.2
GIS for Educators
Universities and Colleges
K-12, Primary, Middle and Secondary Schools
Libraries and Museums
Find the latest GIS conference proceedings and journals.
First Time Visitor?
Training Managers
Authorized Training Program
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For the first time, the annual number of new students starting with a postgraduate UNIGIS distance l...
UNIGIS Krakow - Intro Workshop for New Students
50th UNIGISprofessional Study Group
Salzburg MSc students gather for startup workshop
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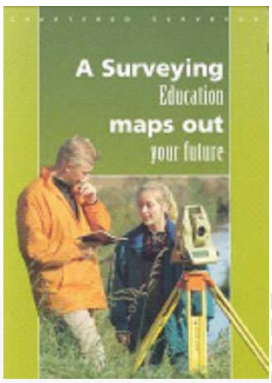
Workgroup 2.3: Marketing & Management

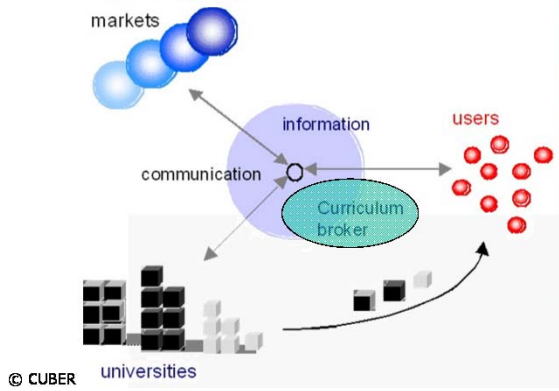
Chair: Gert Steinkellner, BEV (Vienna, Austria)

- Perception of profession
- Awareness building
- Marketing
- Recruition
- PR
  - Brochures
  - Newsletters
  - Web
- Networking
- LLL

Reinfried Mansberger

Marketing & Management





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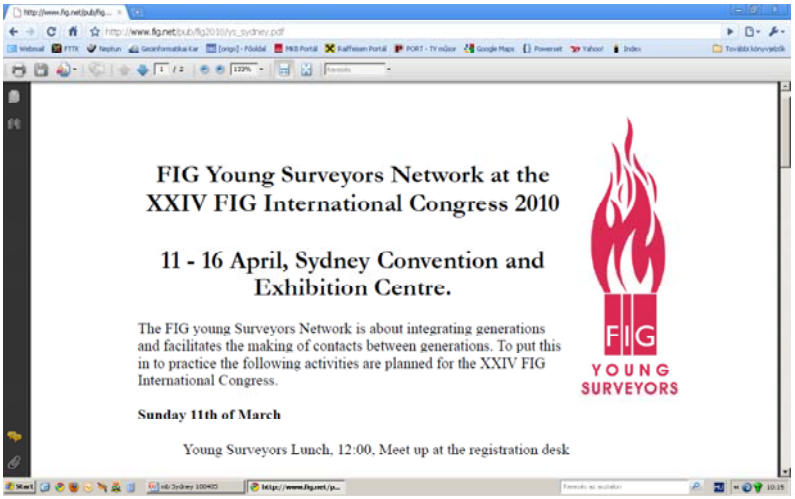
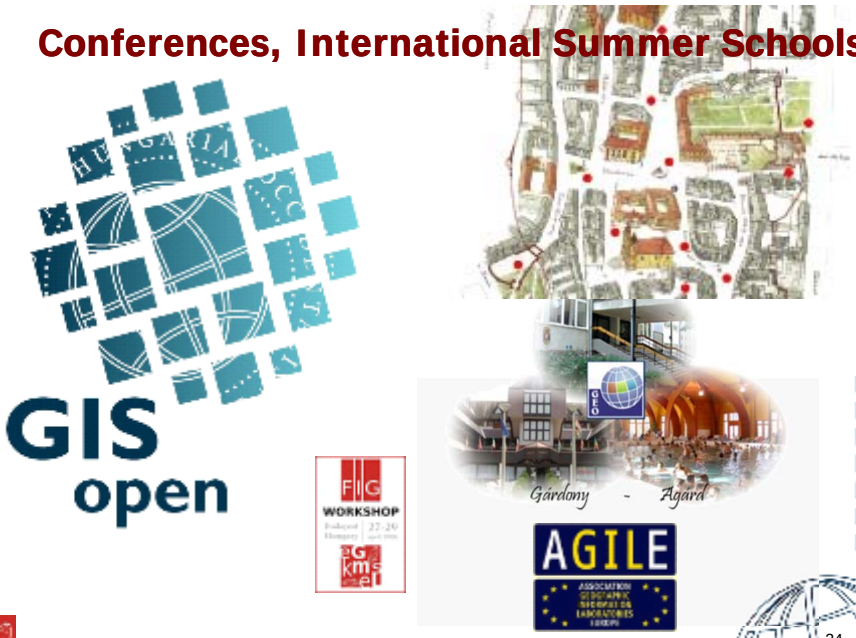
Young Surveyors



Conferences, International Summer Schools



Learning@organizations

- Daily tasks evolving faster than universities can produce qualified experts, many employers apply constant, on-the-job training to remain competitive. E-learning programs help staff members to obtain new skills and critical improvements quickly and efficiently.
- Companies integrate e-Learning into mainstream. They can easily integrate learning modules into staff communications, and can add similar tools to web-based systems.
- e-Learning open the world. Likewise, small businesses can access the same level of knowledge and insight that was earlier only available to large companies.
- Mobile technology helps e-Learning initiatives. Wireless technology allows educators to reach learners in their working environment.
- Computer Supported Ubiquitous Learning is defined as a ubiquitous learning environment that is supported by embedded and invisible computers in everyday life.

Open education

... is a collective term that refers to forms of education in which knowledge, ideas or important aspects of teaching methodology or infrastructure are shared freely over the internet.

It was inspired by related concepts like Creative Commons, open source, open data and open Access, and expands them to include lectures and other courseware.

Source: Wikipedia

Workgroup 4: Real Estate Valuation and Management Education

Joint WG with Commission 9

- **In the spring of 2008 a comparative study on how the education of real estate economics is arranged in different countries will be made by the WG. The outcome gathered from different countries will be composed into a summary report.**

- **Chair: Prof. Arvo Vitikainen (Helsinki, Finland),**
- **e-mail : arvo.vitikainen@tkk.fi**

Projects

- **NCGIA Core Curriculum**
- **Open Learning for Land Offices – TEMPUS (1995)**
- **Staff Development in Land Administration – TEMPUS (1998)**
- **Land Information Management for Executives (2000)**
- **EEGECS – networking in Surveying and Cartography**
- **BEGIN – TEMPUS, Russia**
- **COST G9 – Modelling Land Market processes**
- **TéT FNU, China – Environmental Modelling**
- **Land Valuation Training – Romania, UK, Greece**
- **Nature GIS**
- **GI-Indeed**
- **WAREMA - Water resources management in protected areas**
- **ERASMUS**
- **CEEPUS**
- **MSc in Geoinformatics in Croatia, Zagreb - TEMPUS**
- **MSc in Geoinformatics in Kazahstan, Almaty - TEMPUS**
- **MSc in Geoinformatics in Tajikistan, Dushanbe - TEMPUS**
- **Nature SDIplus – INSPIRE**
- **SDiLAplus**
- **Development of New Land Governance Studies in Macedonia and Ukraine**

NatureSDIplus
The Nature-SDI plus project
Best Practice Network for SDI in Nature Conservation
Co-funded by the Community Programme eContentplus
ECP-2007-GEO-317007
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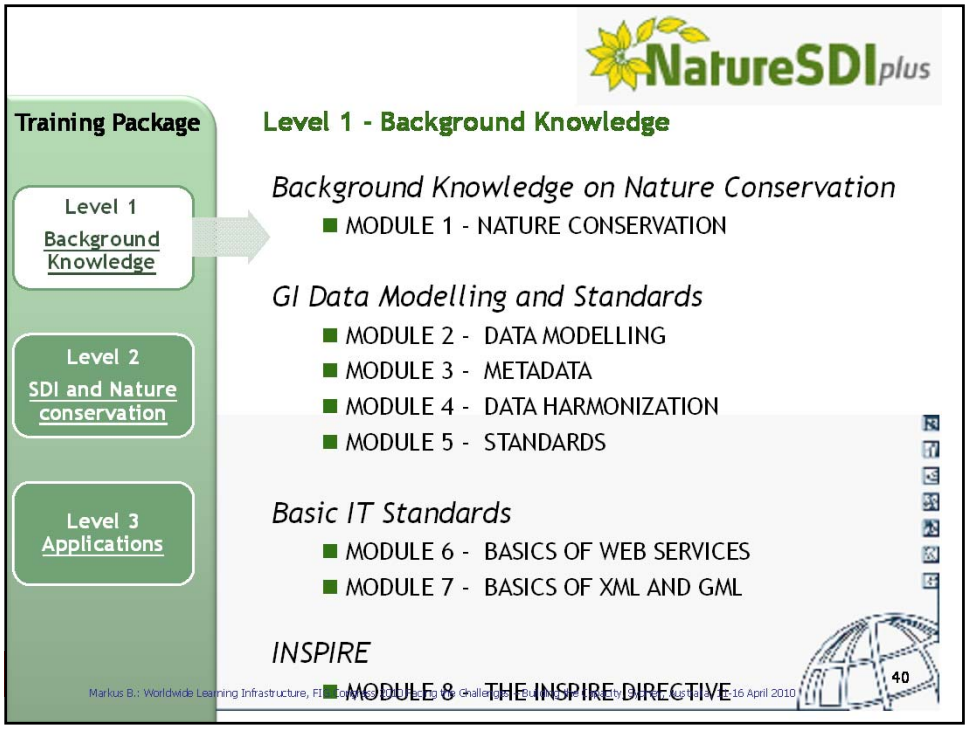
NatureSDIplus
Training Package
Level 1 Background Knowledge
Level 2 SDI and Nature conservation
Level 3 Applications
Level 1 - Background Knowledge
Background Knowledge on Nature Conservation
MODULE 1 - NATURE CONSERVATION
GI Data Modelling and Standards
MODULE 2 - DATA MODELLING
MODULE 3 - METADATA
MODULE 4 - DATA HARMONIZATION
MODULE 5 - STANDARDS
Basic IT Standards
MODULE 6 - BASICS OF WEB SERVICES
MODULE 7 - BASICS OF XML AND GML
INSPIRE
MODULE 8 - THE INSPIRE DIRECTIVE
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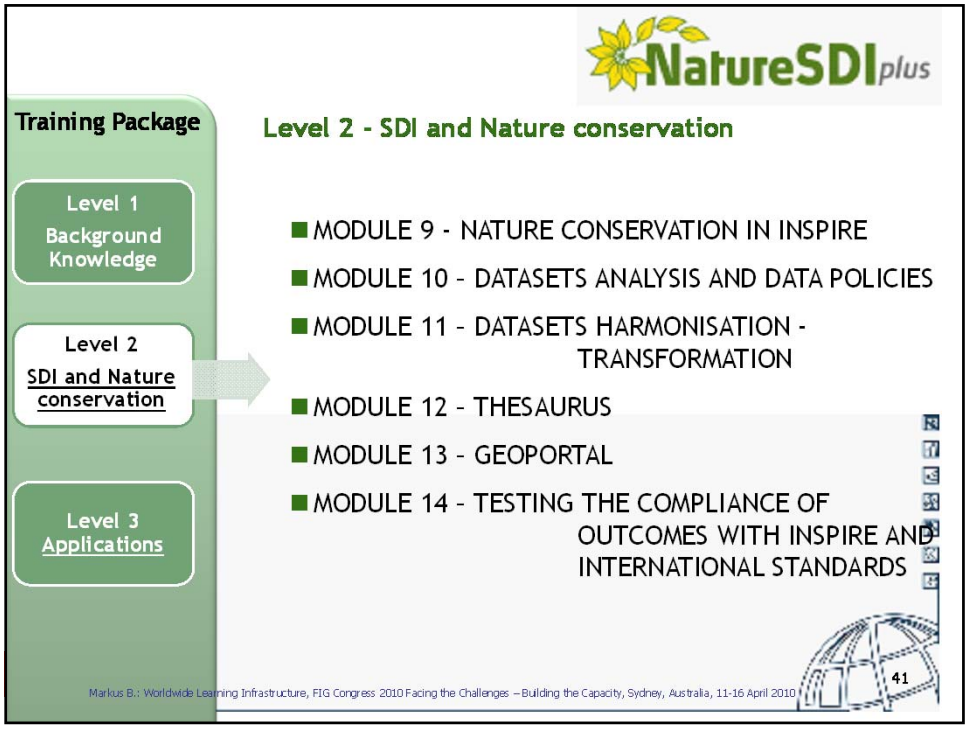
NatureSDIplus
Training Package
Level 1
Background Knowledge
Level 2
SDI and Nature conservation
Level 3
Applications
Level 2 - SDI and Nature conservation
MODULE 9 - NATURE CONSERVATION IN INSPIRE
MODULE 10 - DATASETS ANALYSIS AND DATA POLICIES
MODULE 11 - DATASETS HARMONISATION - TRANSFORMATION
MODULE 12 - THESAURUS
MODULE 13 - GEOPORTAL
MODULE 14 - TESTING THE COMPLIANCE OF OUTCOMES WITH INSPIRE AND INTERNATIONAL STANDARDS
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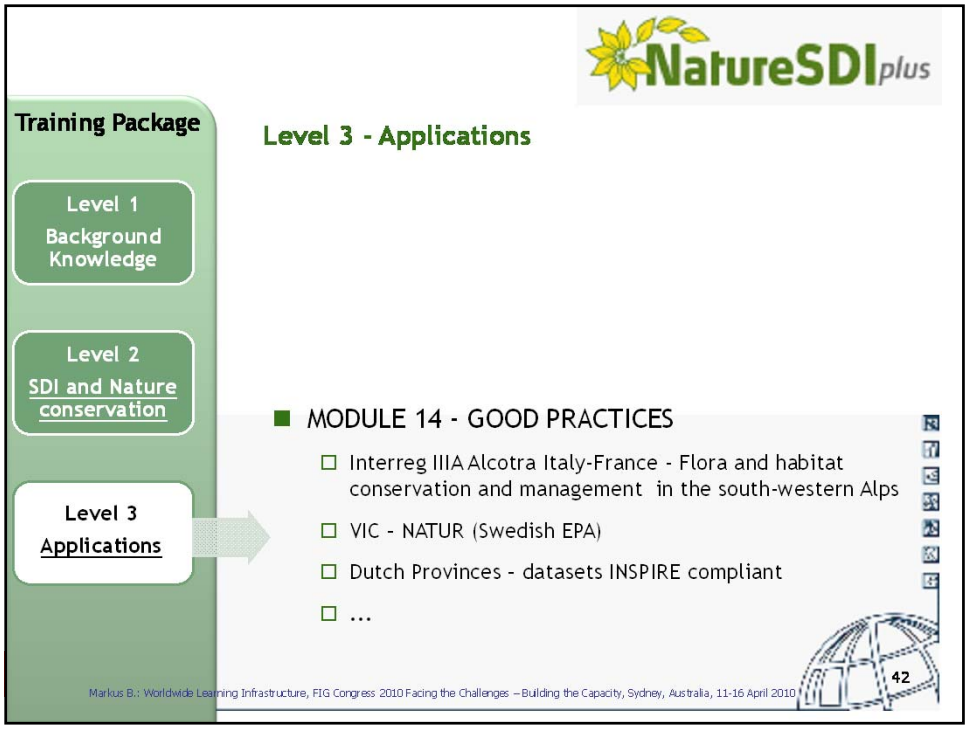
NatureSDIplus
Training Package
Level 1
Background Knowledge
Level 2
SDI and Nature conservation
Level 3
Applications
Level 3 - Applications
MODULE 14 - GOOD PRACTICES
Interreg IIIA Alcotra Italy-France - Flora and habitat conservation and management in the south-western Alps
VIC - NATUR (Swedish EPA)
Dutch Provinces - datasets INSPIRE compliant
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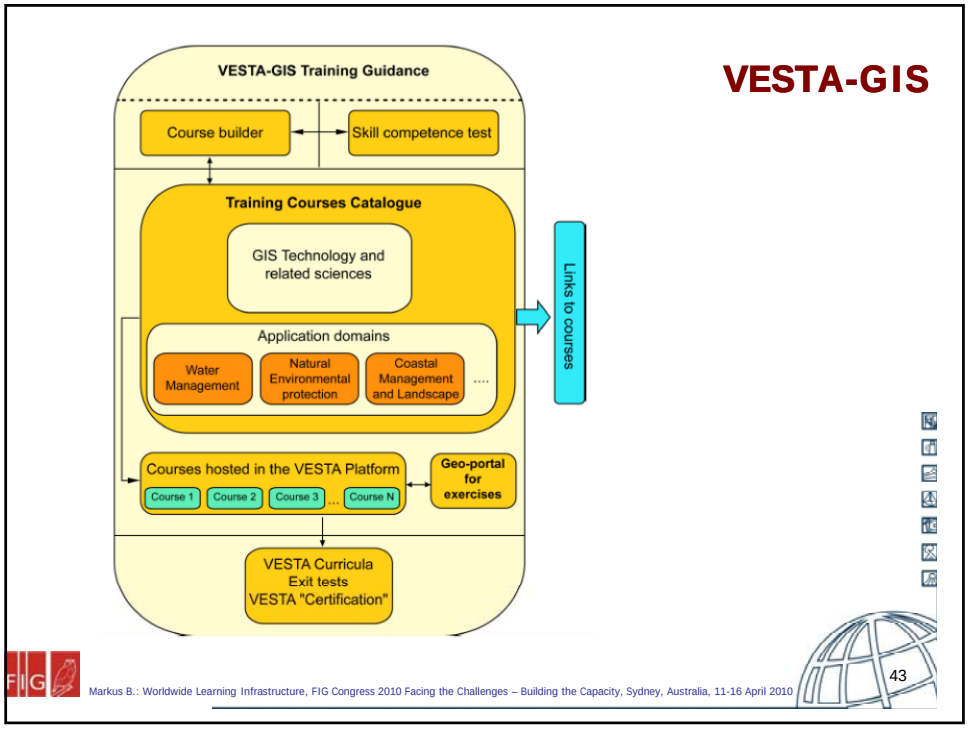
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Skill competence test
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GIS Technology and related sciences
Application domains
Water Management
Natural Environmental protection
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Links to courses
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Exit tests
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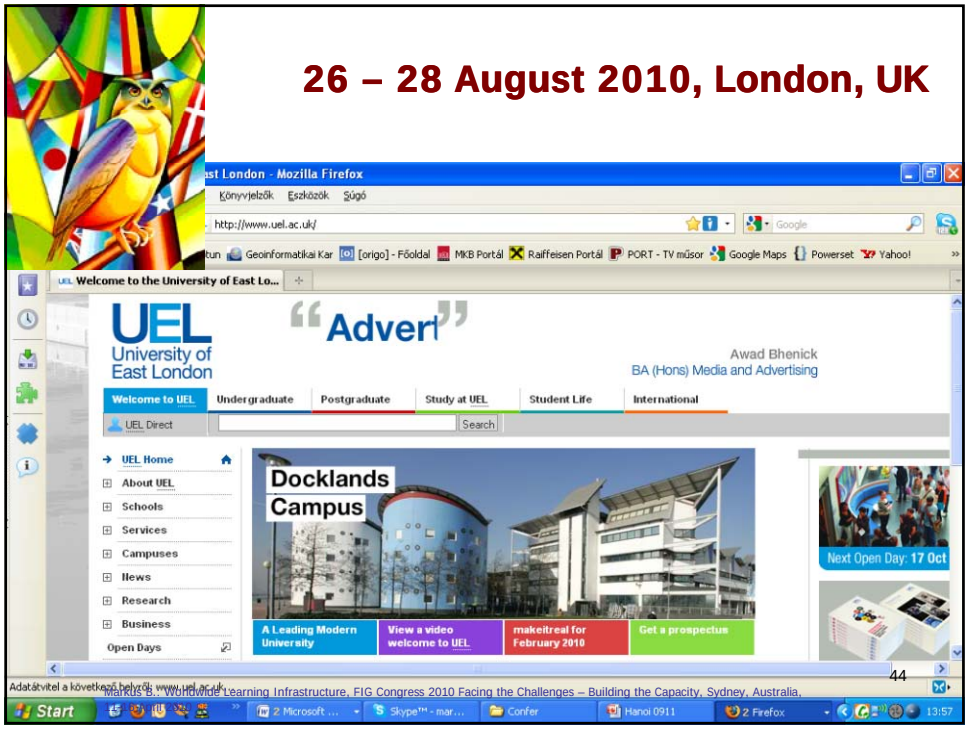
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Next Open Day: 17 Oct
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Commission 2 - Website

FIG Academic Members

Conclusions

- Focus on core competences - Body of Knowledge
  - Involve more soft skills
    - Software – system integration
    - 3D data processing, analysis and visualisation
    - Project management, Working in teams (and integrate)
    - Solving complex problems
- u-Learning?
- Communicate, cooperate, coordinate
  - Strengthen communication and networking activities
  - MSc – staff mobilities
  - PhD – student mobilities
  - Share experiences in open systems and educational management and marketing
- Continue series of annual workshops
- Strengthen the link with Young Surveyors
  - Organize Summer / Winter Schools

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