



aastakonverents 2011

21-22. oktoober, Sagadi mõis



Geoinformaatika kooliharidusse: ideed ja probleemid meil ja mujal

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Tartu Ülikool



Algus...

Entusiastlikud õpetajad, kõigepealt USAs, aga seejärel ka teistes riikides, hakkasid geograafia õpetamisel arvutit kasutama juba 1990ndate algul. Sajandi lõpuks oli kogunenud kriitiline hulk:

- õppematerjali (laserplaadid, n. Encarta, **EGCD**),
- projekte (n. HERODOT, GEO.NET),
- sobivat tarkvara (ArcExplorer, SimCity)

ja Interneti areng jõudnud nii kaugele, et enam ei küsitud “kas?”, vaid hakati arutama:

- **mida?**
- **kuidas?**

Käesoleval sajandil rida projekte, näit.:

GISAS

Coordinator

Department of Geography, University of Helsinki, Finland

Partners

Finnish National Board of Education, Finland
Josef Stefan Institute, Slovenia
Kogeka 6, Sint- Dimpnacollege, Belgium
Holy Heart Institute, France
2nd Lyceum of Larisa, Greece
Széchényi Ferenc Gymnasium, Hungary
Scientific Public Lyceum 'Piero Gobetti', Italy
Gaigalava Elementary School, Latvia
Torsberg Gymnasium, Sweden

Objectives

- To introduce geographical information systems (GIS) into European secondary schools
- To create a model on how to incorporate GIS into secondary school geography and environmental education
- To organise virtual in-service teacher training on GIS
- To create educational materials, exercises and a web-based learning environment for teachers and their students
- To test and develop these outputs in real-classroom situations with the help of partner school teachers
- To conduct research on the ways how GIS is used in secondary school education
- To develop and support international cooperation among teachers and students in web-based learning environments

Project Description

GISAS is a three- year (2003-2006) education and research project funded by the Minerva action of the European Commission. The aim of the project is to develop ways in which geographical information systems (GIS) are applied to secondary school education and teacher training.

The GISAS project introduces a new innovation of ICT (Information and Communication Technology) in European education system. It brings Geographical Information Systems (GIS) into secondary and upper secondary school geography and environmental education and to both pre- and in-service teacher education.

Aims

The general aim of the project is to develop a model and ways in which GIS are applied to school education and to both pre- and in-service teacher education.

Käesoleval sajandil rida projekte, näit.:



The image shows the iGuess logo on the left, which features a globe and the text "iGuess Integrating GIS Use in Education in Several Subjects". To the right is a photograph of a classroom where students are seated at desks with computers. A monitor in the foreground displays the text "iGuess Introducing GIS Use in Education in Several Subjects".

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You are here: [About iGuess](#) » Context & Motivations

Context & Motivations

GIS, Geographical Information System, is a tool that is already widely used in all sorts of businesses: industry, public services,.. Outside the schools, people are using this tool to create, store, analyse and manage spatial data and associated attributes, what might be known as geo-information. This GIS technology is rapidly emerging into several aspects of society and is gaining importance (examples are GPS and digital maps). Many of the European students will get into contact with it in their future professional lives.

Schools in the USA have picked up on this years ago and are gradually integrating GIS in their curricula. They play a leading role in the educational use of GIS. Unfortunately, European schools are lagging behind, mainly due to unawareness and lack of skills among teachers and partially due to the fact that the software to use and study GIS is quite expensive. However, new framework curricula in European school education will include GIS as a learning goal for secondary schools. GI in education is an EC initiative under the IST programme; this proposal complements the activities of this programme.

Given the current situation, as described above, we can conclude that there is a great necessity for European in-service teacher training projects, introducing and developing GIS in secondary education and lowering the threshold for all teachers by creating an easy access to a workable course.



Käesoleval sajandil rida projekte



- 2009.a. ülevaade “***GIS in schools: State of the Art***”
 - riigiti Austria, Belgia, Bulgaaria, Inglismaa, Kreeka, Prantsusmaa, Soome, Ungari
 - “...*initiatives in GIS for secondary school education and related research has been extremely fragmented in Europe*”



Käesoleval sajandil rida projekte



2008 *The European standard for GIS in Secondary Schools*

- A GIS component in a schools programme prepares school leavers who:
 - can actively participate in public decision making use of spatial information and visualization;
 - understand the basic purpose and application of GIS to interdisciplinary real world problems;
 - can use GI interfaces to obtain geographic information in order to investigate and critically reflect on spatial phenomena;
 - are able to communicate the results of their investigations with the help of GI
 - are aware of the ways of maintaining and building their own GI knowledge and skills



Käesoleval sajandil rida projekte

2008 *The European standard for GIS in Secondary Schools*

o *Learning Outcomes*

- *Visually communicate geographic information*
 - *Example: Produce basic maps*
- *Describe and use examples of GI applications in daily life and in society*
 - *Example: GPS-related/locational (social networking), Google Earth*
 - *Example: Who are the people who use GIS professionally – emergency services, ..., military, civil engineering, transport, academic research*
- *Use **freely** available GI interfaces at a basic level*
 - *Example: Find your house in a digital earth browser*
 - *Example: Find and use data from your national data portal*
 - *Example: Find routes from school to home and back, get a topographical map for a walk*
- ...

2011 alustas:



digital-earth.eu

praegu 65
17 riigist

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The **digital-earth.eu project** examines the use of geographic media in schools and teacher education. Geo-media is the visualisation of information from different media sources and is concerned with digital content and its processing based on place, position and location. Many geographic media are widely used for navigation and routing purposes. Cartographic communication has never been so easy to implement, therefore 21st century school education needs to include geo-media into daily work. Innovative approaches to teaching and learning are needed to study environments from local to global scale.

The **digital-earth.eu network** links innovative centres around Europe where geo-media use is well developed. Products, resources, experiences and ideas are shared between the centres and opened to the public wherever possible.

A **digital-earth.eu infrastructure** is under development. The European Centre and an accredited network of national and regional Centres of Excellence are developing an online catalogue of materials, courses, publications, links and good practice scenarios, and are publishing a series of core publications.

First digital-earth.eu conference

took place from July 4-8, 2011 in Salzburg, Austria



AGIT 2011

1200 osavõtjat 46 riigist



Selle ühe osana: *Learning with GI 2011*



Education and Culture DG



First digital-earth.eu
conference
took place from July 4-8, 2011 in
Salzburg, Austria



Küsimused, mille üle vaieldi/vaieldakse GISi-hariduse foorumitel

- o *learning **about** GIS vrs learning **with** GIS*
- o kust algab GIS
 - Kas *Google Earth*'i tohib nimetada GISiks?
- o **ArcGIS**i küsimus e. kas kommerts- või vabavara?
- o mis see GIS ikkagi on?
- o **GI** = **Geo**Informaatika
 - geograafi roll?
 - informaatiku roll?

GIS {
system
science
studies
services
society

Designing a geoinformatics course for secondary schools: a conceptual framework



Jüri Roosaare,
Raivo Aunap, Ülle Liiber, Kiira Mõisja and Tõnu Oja

Department of Geography, Faculty of S&T, University of Tartu, Estonia

Geoinformaatika valikkursus (35 tundi)

- 2010 vastu võetud uus õppekava rõhub gümnaasiumi osas rohkem valikkursustele
- Euroopa Sotsiaalfondist rahastatav TeaMe programm finantseerib 6 LTT (LoodusTeaduste ja Tehnoloogia) valikkursuse loomist:
 - Loodusteadused, tehnoloogia, ühiskond
 - Mehhatroonika ja robotika
 - Arvuti kasutamine uurimistöös
 - Rakenduste loomise ja programmeerimise alused
 - Majandusmatemaatika elemendid
 - Geoinformaatika

TÜ ja AlphaGISi ühendatud meeskond: Tõnu Oja, Raivo Aunap, Ülle Liiber, Kiira Mõisja, Jüri Roosaare, Vaike Rootsmaa, Eveli Sisas, Ranel Suurna
Materjalide lõplik valmimine 2013

Geoinformaatika valikkursus

Kontseptsioon

- Praktilise suunitlusega kursus:
 - põhiväljundiks on oskus luua ja kasutada kohateavet geograafiliste ülesannete lahendamiseks;
 - õppekomplekti põhiosa moodustavad praktilised ülesanded lahendamiseks iseseisva- või grupitööna.
- Kihilisus:
 - materjal esitatakse eri raskusastmetes, mis võimaldab kaasata erinevate **eelteadmiste** ning huvide ja **võimetega** õpilasi.
- Tunniplaani paindlikkus:
 - saab õpetada ka tunniplaani väliselt täiesti või osaliselt veebipõhise kursusena Moodle'is;
 - **koolidevaheliste õpperühmade moodustamine?**

Geoinformaatika valikkursus

Kontseptsioon

- Lõimumine, õppeülesannete elulisus:
 - ülesanded on seotud õpilase kodukoha ja igapäevase eluga ning esitatakse probleemipõhiselt;
 - geoinformaatika on seotud geograafia ja teiste loodusteaduste, arvutiõpetuse, matemaatika, füüsika, ühiskonnaõpetuse ja ajalooa, aitab kaasa võõrkeele praktikale ja mitmekesisstab koduloo ning kehalise kasvatus tunde
- Lihtsamalt keerulisemale praktiliste ülesannete kaudu:
 - alustatakse intuiivselt tabatavatest praktilistest ülesannetest,
 - lisatakse teooria ja naastakse keerukamate rakenduste juurde.
- Seos karjäärivalikuga:
 - edasijõudnuil on võimalus läbida kursus ülikoolis VÕTAgas arvestavas mahus;
 - praktilised harjutused annavad ettekujutuse, milliste ülesannetega tegelevad valdkonna spetsialistid.

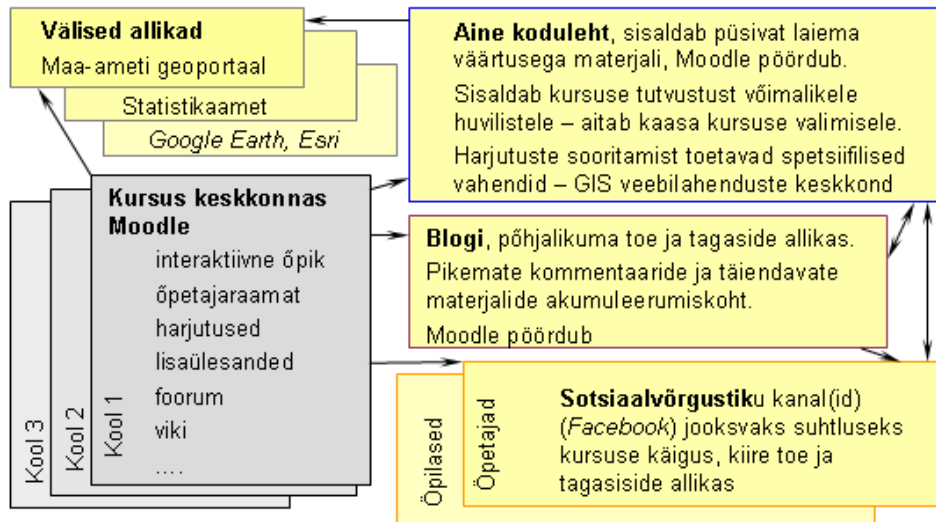


Geoinformaatika valikkursus

Kontseptsioon

- Tarkvara
 - Alustatakse veebirakendustega,
 - edasi orienteerutakse vabavarale (ArcGIS Explorer, Quantum GIS);
 - võimalus soetada kommertstarkvara ühislitsentse.
- Andmed:
 - kasutatakse avalikult kättesaadavaid ning kursuse tarvis valmistatud ruumi- ja statistilisi andmeid

Õppekeskkond internetis – kursust toetavad osad ja nende omavaheline seostumine





Aine teemad, nende ajaline maht, õppetöö vormid

- **GISi mõiste, komponendid ja kasutusvaldkonnad.**
 - Maht: 5 tundi, mis jaguneb: 3 praktilist tööd, 1 interaktiivne loeng, 1 seminar
- **Geograafilised andmed ja andmebaasid.**
 - Maht: 7 tundi, mis jaguneb: 1 õuesõpe; 5 praktilist tööd; 1 seminar



Aine teemad, nende ajaline maht, õppetöö vormid

○ Kaardi matemaatiline alus.

- Maht: 5 tundi, mis jaguneb: 4 praktilist tööd; 1 seminar

○ GISi päringud.

- Maht: 7 tundi, mis jaguneb: 6 praktilist tööd; 1 seminar

○ Teemakaartide koostamine.

- Maht: 5 tundi, mis jaguneb: 4 tundi praktilist tööd; 1 seminar/loeng



Aine teemad, nende ajaline maht, õppetöö vormid

o **Probleemülesande lahendamine**

- Maht: 5 tundi, mis jaguneb: 4 tundi praktilist grupidööd; 1 seminar

2012 peaks minema pilootkoolidesse katsetustele

Täna kuulamast!