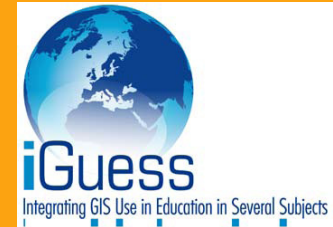




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iGuess – pedagogical approaches and their implications for sustainability

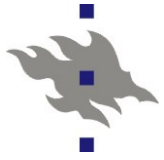
EUROGEO Seminar and Annual Meeting
Sustainable Geographies

Charles University, Prague, Czech Republic
8th May 2010

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Department of Geosciences and Geography

University of Helsinki, Finland



Contents of the presentation



- Introduction to the iGuess Project
- Pedagogical approaches of the iGuess course exercises
- Implications for sustainability – assessment and discussion
 - Dissemination of the course to a wider group of users
 - Do the selected pedagogical approaches help to overcome curriculum constraints?



iGuess – Integrating GIS Use in Education in Several Subjects



- A two-year (2008–2010) teacher training project funded through the Comenius/Lifelong Learning Programme of the European Commission
- To create a teacher training course which will support and facilitate to use of Geographical Information Systems (GIS) in the secondary school classrooms in various subjects
- To bring together many GIS professionals and teachers from different European countries to share experiences and join forces to reach the common goal



iGuess – Consortium



- 10 partners from eight European countries
 - KOKEGA, Belgium
 - Pedagogical University Linz, Austria
 - GREEN, Belgium
 - VVKSO, Belgium
 - University of Sofia, Bulgaria
 - University of Helsinki, Finland
 - Holy Heart Institute, France
 - University of the AEGEAN, Greece
 - Danube-Drava National Park Directorate, Hungary
 - Digital Worlds International Ltd., United Kingdom
- Associated partner, ESRI Europe, The Netherlands
- External evaluator, Dr. Karl Donert, United Kingdom



iGuess – teacher training course



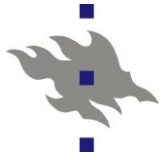
- A five-day intensive course in Geel, Belgium (20–25 September 2010)
- Course programme:
 - Day 1: Introduction and basics of spatial thinking and GIS learning
 - Day 2: GIS exercises in several subjects applied to several countries
 - Day 3: Fieldwork with GPS to collect and process geodata
 - Day 4: Didactical guidelines for preparation and development of own exercises
 - Day 5: Presentation of work at European Parliament in Brussels and delivery of certificates to the participants



EC Expert Group Recommendations



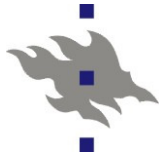
- A report *Science Education NOW: A Renewed Pedagogy for the Future of Europe (2007)* states that
- *"a reversal of school science-teaching pedagogy from mainly deductive to inquiry-based methods provides the means to increase interest in science"*
- *"renewed school's science-teaching pedagogy based on inquiry-based science education provides increased opportunities for cooperation between actors in the formal and informal arenas"*
- *"teachers are the key players in the renewal of science education. Among other methods, being part of a network allows them to improve the quality of their teaching and supports their motivation."*



EC Expert Group Recommendations



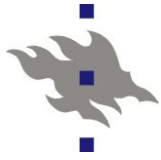
- A report *Science Education NOW: A Renewed Pedagogy for the Future of Europe (2007)* recommends that
- Recommendation 2: *”improvements in science education should be brought about through new forms of pedagogy: the introduction of inquiry-based approaches in schools, actions for teachers training to inquiry-based science education, and the development of teachers’ networks should be actively promoted and supported”*
- Recommendation 4: *”measures should be introduced to promote the participation of cities and the local community in the renewal of science education in collaborative actions at the European level aimed at accelerating the pace of change through the sharing of know-how.”*



EC Expert Group Recommendations



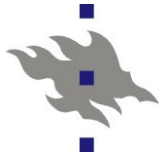
- Rocard, M., P. Csermely, D. Jorde, D. Lenzen, H. Walberg-Henriksson & V. Hemmo (2007). *Science Education NOW: A Renewed Pedagogy for the Future of Europe*. European Commission, Directorate-General for Research Science, Economy and Society. Belgium. EUR 22846.



GIS and various learning approaches



- GIS in schools usually justified by their functionalities to support problem-based learning (PBL), problem-solving (PS), and inquiry-based learning (IBL)
- All three are active learning approaches based on the constructivist belief and offer opportunities for co-learning amongst students (Pawson et al. 2006:104)
- PBL has a long tradition in geography education, particularly in the form of inquiry (Solem 2001)
- It is often confusing to know which approach is which because *hybrid forms* of PBL are also available



Some differences among these learning approaches



- In PS and IBL the knowledge to be developed must be acquired in advance of participation in the problem-solving process, for example field work following in-class learning
- In PBL it is the problem, which defines what is to be learned (problem first learning)
- In PBL and also in its hybrid forms a course assignment is organized around problem scenarios rather than subjects or topics > problems do not respect subject boundaries

Source: Pawson, E., E. Fournier, M. Haigh, O. Muniz, J. Trafford & S. Vajoczki (2006).

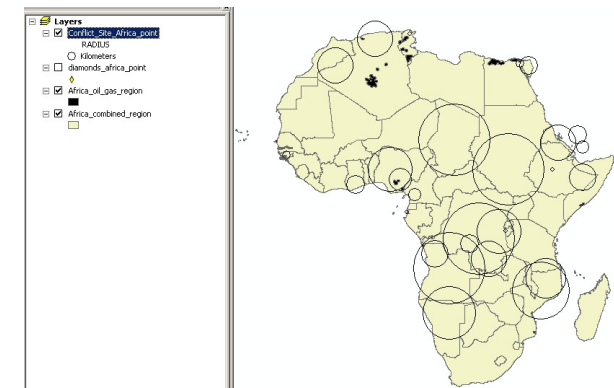
Problem-based Learning in Geography: Towards a Critical Assessment of its Purposes, Benefits and Risks. *Journal of Geography in Higher Education* 30:1, 103–116.



Learning approaches of the iGuess course exercises using GIS



- 12 exercises developed by project partners
- No uniform pedagogical guidelines nor instructional frameworks set for creating the exercises
- Topics vary from studying the hardness of tapwater in a local municipality to the observation of the proximity of natural resource deposits and armed conflicts in Africa
- Each exercise has a lesson plan worksheet and a set of selected iNotes to help the teachers to adopt them





Learning approaches of the iGuess course exercises using GIS



- 12 exercises developed by project partners
 - The volcanoes in Greece (IBL)
 - Earthquakes in Greece (IBL)
 - Sustainable school mobility (PBL hybrid)
 - European languages in Africa (IBL)
 - Industrial zones (IBL)
 - GPS exercise shops (IBL)
 - GPS exercise parking space (PBL hybrid)
 - GPS exercise butchers and bakers (PBL hybrid)
 - GM maize (PBL)
 - Hardness of tap water (IBL)
 - Black storks (IBL)
 - Conflicts and natural resources in Africa (IBL)



Learning approaches of the iGuess course exercises using GIS

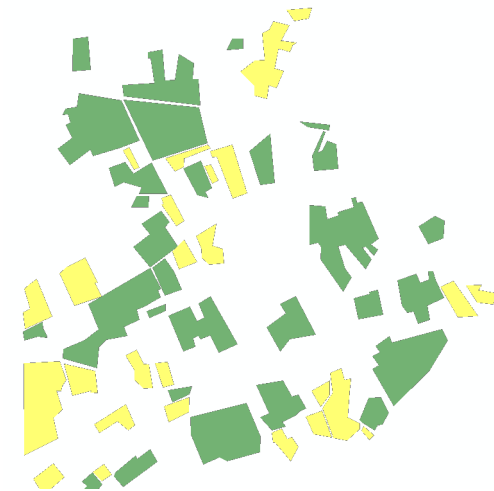


■ Results:

- 8 out of 12 exercises have IBL approach
- 3 out of 12 exercises have PBL hybrid approach
- only one exercise can be interpreted as purely PBL

GM maize fields (yellow)

non-GM maize fields (green)

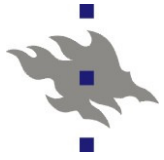




Implications for sustainability



- Dissemination of the course
- Curriculum constraints in different European countries



Implications for sustainability



- Dissemination of the course
 - replication of the course in different setting and with teachers from different backgrounds
 - IBL approach is a more subject-oriented than the PBL
 - does IBL attract teachers from other subjects to learn GIS?
 - science education (IBL) vs. applied disciplines (PBL)
 - imprisoned in geographic inquiry



Implications for sustainability



- Curriculum constraints
 - lesson hours dedicated to geography
 - existing traditions of cross-disciplinary learning
 - collaboration of teachers across the subject boundaries
 - interpreting the iGuess exercises into a more PBL-oriented way by the future participants
 - Problem first, inquiry next...
 - networking with cities and local organizations
 - challenge the existing traditions and take steps to act upon the future goal set by the EC expert group (EC 2007)



Discussion... Continues!
Thank you for your attention!



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