

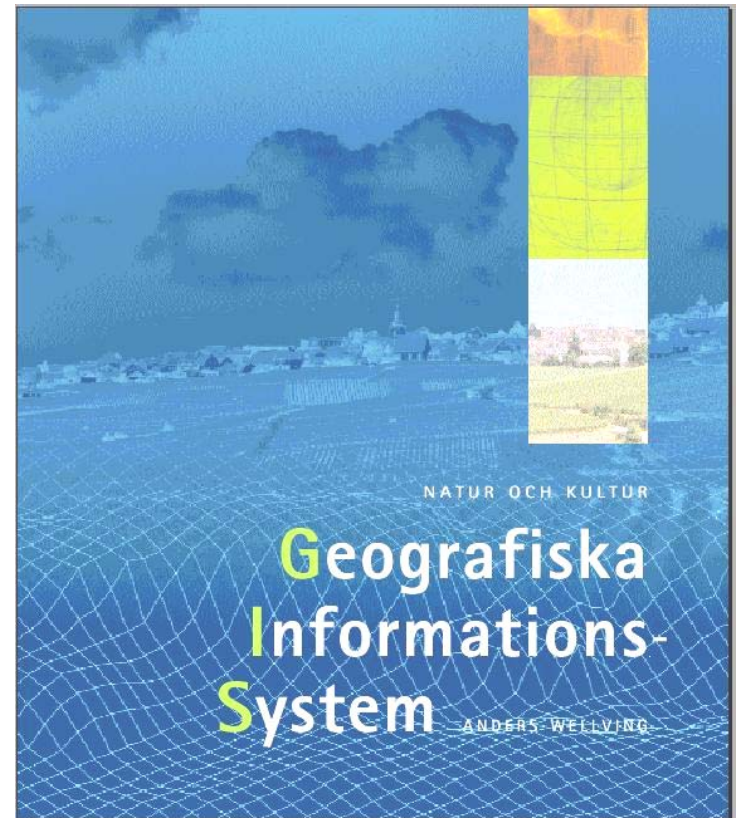
How do we stimulate the interest for GIS in Swedish secondary schools?

ESRI European User Conference
Stockholm 2007

Clarifications

- With GIS I mean GI-Science
 - The "interest" among students as well as teachers and headmasters is considered
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Background

- ❑ An elective GIS-course was introduced in upper secondary schools in 2001
 - ❑ Only a few hundred students are examined in this course each year
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Technical reasons for the low number of examinations

- Very few schools can offer the elective course due to lack of teachers and equipment (2 %)
 - When offered the course is sometimes cancelled due to a low number of signed students
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The Swedish education system

Pre-school		Age < 7 years
Compulsory school	Grades 1-9	
Upper secondary school	Grades 10-12	818 schools; 120 000 students; 17 programs; 40 000 students in theoretical programs;
University		

Learning outcomes for GE1203 GIS

The student should...

- ❑ Be familiar with modern cartography and GIS
 - ❑ Be familiar with different types of geographic information
 - ❑ Be able to work independently with GI in projects
 - ❑ Be able to do simple modeling of environmental parameters
 - ❑ Understand the importance of aerial photography in spatial planning
 - ❑ Be able to design cartographic presentations
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Research for this paper

- Interviews with teachers
- Feedback on my textbook
- Evaluation of some given courses

...in a limited way

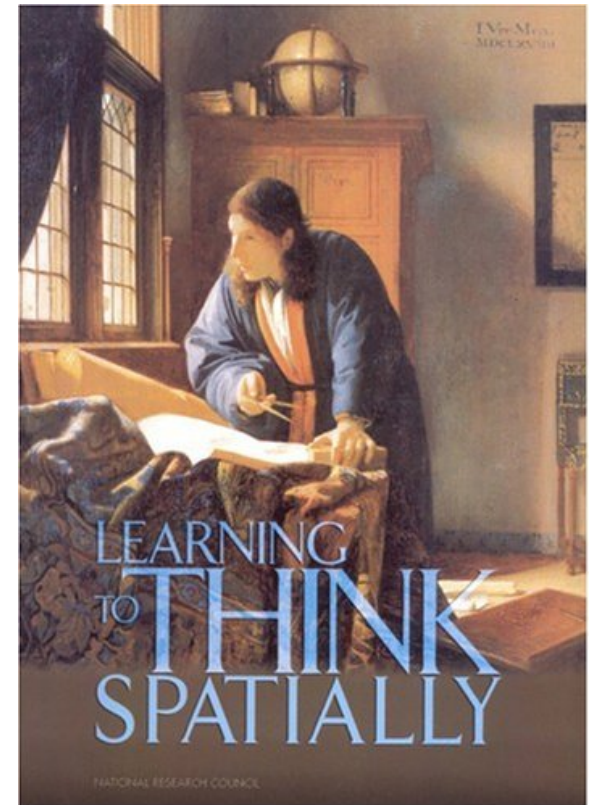


Do we need GIS education at all?

- ❑ GIS is a support system for "spatial thinking"
 - ❑ It is the most important tool for handling spatial information
 - ❑ GIS use promotes problem based learning
 - ❑ The students can work with authentic data on real-world problems
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Learning to Think Spatially

A recent report from
the Committee on the Support
for Thinking Spatially and The
Incorporation of Geographic
Information Science Across the
K-12 Curriculum



Findings

- Teachers
 - Students
 - Headmasters
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Reluctant teachers

- ❑ Schools that give courses have at least one teacher that burns for the technology
 - ❑ The rest of the potential teachers seems to miss the necessary competence
 - ❑ Geography teachers are more interested in teaching geography than GIS
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The teachers demand for assistance

- ❑ Better training in the daily work with computers
 - ❑ Special training in managing the GIS software
 - ❑ Access to local data and digital maps
 - ❑ Help to design lessons and exercises
 - ❑ A budget for purchase of software and databases
 - ❑ Time to spend on personal training
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What about the students?

- ❑ Students make tactical choices of courses
 - ❑ Good GIS courses are popular, students like to work with GIS
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Example of a successful course

- ❑ 20 hours exercises combined with lessons
 - ❑ 15 hours with an individual GIS project
 - ❑ A study visit at a community department
 - ❑ A final presentation before the class
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- ❑ Software: ArcView 3
 - ❑ Data: local from the county administration and community
 - ❑ Literature: a compendium with theory and ten exercises
 - ❑ Hardware: one student per computer
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How do we create interest?

- “Instead of seeking ways to get GIS into classrooms, we should be seeking ways to create meaningful learning opportunities in which the need for GIS is obvious”
(Bob Coulter)
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Use exciting new technology

- ❑ Modern GIS softwares

 - ❑ Google Earth
 - ❑ Web Map Servers of different kinds
 - ❑ GPS and geocaching
 - ❑ Geocoded photo archives
 - ❑ Satellite images
 - ❑ DTMs
 - ❑ Relevant downloadable data
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How to convince the headmaster?

- ❑ Motivated teachers will convince the school management
 - ❑ There is a competition between schools regarding resources and students. GIS projects can be mentioned in media and thus give credit to the school.
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The headmaster should give..

(Committee on Spatial Thinking, 2006)

- material support
- logistical support
- curriculum support
- instructional support
- community

This is not very expensive or demanding!

Conclusions

- ❑ Elective courses will not be chosen by the students if the teachers do not promote them. Therefore the teachers GIS-competence is a key issue.
 - ❑ The students should work with such projects were it is obvious that GIS is a necessary tool
 - ❑ Some projects should be mentioned in media in order to make headmasters happy
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A final question:

- Should GIS be included in subjects like geography or geoscience?
 - No, GIS courses should be elective for all students in theoretical programs, not only for those who study these subjects.
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