Implementation of the NSDI into secondary school education

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The Law gives a definition of:

- NSDI services,
- metadata and its content,
- spatial data and subjects obliged to participate in its establishment and maintenance,
- institutional framework

It defines NSDI bodies and their responsibilities

All articles of the Law defining NSDI – fully in line with INSPIRE
Organisational structure

- WG for the NSDI technical standards
- WG for spatial data sharing policies
- WG for linking the NSDI program and e-Government
- WG for establishing a business model for the NSDI establishment
- WG for building the NSDI establishment capacities
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Working group

- 10 members representing state, regional and local government, self-government bodies and private sector
- meets on a regular basis every month as of October 2009

- **its mission:** efficient establishment of NSDI capacity building model - enables adoption of NSDI concept in society and its installation in work processes

  - network of GIS/NSDI professionals - accelerate NSDI process
Problems

- readiness of the user community to accept the NSDI concepts and integrate them in their working processes

- lack of GIS/NSDI professionals to provide the necessary expertise in order to implement the NSDI establishment process
Tasks

• to identify weaknesses in capacity building for NSDI establishment and give best practices examples

• to build NSDI capacity building model

• to work on professional literature on NSDI

• to make proposals for NSDI subjects on different educational levels (schools, faculties etc...) 

• to establish network and communication between educational institutions in Croatia and abroad
not enough information and knowledge on the representation of spatial data in the Croatian education system

survey

included secondary school educational institutions, faculties and research institutions in the Republic of Croatia
Application of spatial data in secondary schools
AIM

- explore the representation of spatial data in the educational system, with special emphasis on the NSDI

- assess the knowledge on the use of spatial data that students receive during their schooling,

- determine whether the curriculum meets modern educational trends

- get teachers' recommendations for teaching improvements in the field of spatial data
Questions in the questionnaire were divided into the following topics:

I. topics related to spatial information in the curriculum

II. using spatial data in:
   a. the teaching activities
   b. extra-curricular activities

III. suggestions for improvement
The questionnaire

• consists of a header with an introduction and instructions, followed by 17 questions of combined type

• still on the webpage of the Croatian State Geodetic Administration (www.dgu.hr) and all Croatian secondary schools are invited to participate
Spatial data is used in the following subjects:

- Geography,
- Biology,
- Chemistry,
- Physics,
- Ecology,
- Geodesy,
- Geology,
- History,
- Biology,
- Croatian Language,
- Art...
Use of spatial data in secondary school curriculum:

- geography and cartography
- calculating area
- geography of different countries, number of inhabitants,
- historical changes of boundaries, wars, making thematic land cowers,
- maps of minerals and mines,
- maps of national minorities and religions in different regions,
- diseases in different regions,
- analyzing mortality and number of births in different regions,
- distribution and concentration of industries
- analyzing the changes of the infrastructure and traffic problems,
- making thematic maps after filed collection of data,
- ...

- ...
Use of spatial data in secondary school

- Geographic and school maps
- Atlases
- Topographic maps
- Touristic maps
- City maps
- Satellite and aerial images
- Online spatial data
- Open Street Map
- Road navigation
- GPS maps
- Other
Pupils’ knowledge

Are pupils educated enough to be able to use maps?

Does education of pupils through regular teaching satisfies pupils’ needs in usage of today’s navigation tools?

Would higher interoperability of spatial data contribute to higher level of pupils’ knowledge?
Teacher education recommendations

Would usage of spatial data and NSDI teachers’ educational portal raise the quality of education?

Would guest lecturing as part of regular teaching on the subject of usage of spatial data and NSDI be useful for teachers and pupils?

Is it necessary to better inform teachers about spatial data and its usage?

![Graph 1: Not enough vs. Excellent](image1)

![Graph 2: Not enough vs. Excellent](image2)

![Graph 3: Not enough vs. Excellent](image3)
I. Education of teachers and pupils

• organizing practical workshops of experts in the NSDI fields,

• extending Croatian national e-learning portal using games, exercises and presentations on the NSDI topics ([https://lms.carnet.hr/lms/login.jsp?dd=1307379393696](https://lms.carnet.hr/lms/login.jsp?dd=1307379393696))

• updating teachers with new sources of information of NSDI development

• organizing field education for teachers
II. Connection of Internet pages (teachers/NSDI)

- making Internet link to teachers’ educational Internet pages [www.skole.hr]
- connecting the NSDI portal with the national e-learning portal
III. Higher interoperability of spatial data

- making available spatial data to teachers and teaching processes

- enabling higher interoperability of spatial data through Internet and other media

- ensuring lower prices of maps and navigation tools for schools
IV. Extension of curriculum

- introducing NSDI as a new subject in the curriculum

V. Cooperation between schools and teachers with NSDI institutions and experts

- ensuring better cooperation between teachers, secondary schools and NSDI institutions and experts
Conclusions and future work
• experience of teachers directly involved in the educational system of future GIS and NSDI specialists - great benefit (guidelines and recommendations)

• preliminary survey processing results show clear need for:
  - education of teachers,
  - higher spatial data interoperability,
  - cooperation
  - connection of internet pages on spatial data topics.

• recommendations and proposals for the introduction of courses at Geoinformatics and other secondary school programs at different educational levels,
Thank you for your attention!