raum:planen –
An Online Learning Environment for Spatial Planning
Veronika ASAMER & Thomas JEKEL

Abstract
Spatial planning is difficult to teach at secondary school level. It is based on complex legal and administrative frameworks essentially affecting everyone. Spatial planning is a compulsory topic in Austrian schools curricula. At the same time, no Austrian learning materials for secondary schools include interactive environments accessing real world data.

In pedagogy and educational science, there is a consensus that collaborative learning is one of the most important teaching and learning principles. The project raum:planen develops a GI-based learning environment for spatial planning to help students realize the importance of spatial planning in their personal environments, using real world data via webmapping services. It does so by developing the ability to read, interpret, annotate and discuss zoning maps. The project intends to confront pupils with learning media simulating participation in the planning process and offering additional legal information sources for that purpose.

1 Introduction
Online mapping services offer new possibilities to use visualization of spatial planning documents as a fundamental component in participatory decision making. The technical possibilities allow for toolset directly linking into the concept of spatial citizenship that argues for participation and communication based inclusion of GIS in secondary education (STROBL 2008, GRYL et al. 2010). This development is clearly supported by governments of the local state, as well as the European INSPIRE initiative, who try to make their geodata services available online (see www.salzburg.gv.at/landkarten.htm; http://inspire.jrc.ec.europa.eu/).

However, the growing real world data access does not transpire to secondary education so far. This may be based on one or more of the following problems. Firstly, the online efforts of local and state governments have not been included consistently in teacher training; secondly, up to a few years back data acquisition from local institutions has been a rather difficult process that did not easily translate into everyday needs and possibilities of teachers. Thirdly, full strength GIS were needed to work with data, leaving teachers needing full GIS education. These factors limited GIS use in school to a minimum documented in various empirical studies (see KERSKI 2003, JOHANNSON 2008). It led to the fact that spatial planning was usually taught using far-away examples available in school books.

As with citizenship education in general, spatial planning looks into the traditional concept of the ‘dutiful citizen’ (BENNET et al. 2009) – knowing about duties and rights within a certain spatially bounded community. It may be suggested that citizenship education does
not fit with implicit citizenship concepts of young people – adhering to rules and tools of a social web society, and therefore may not yield adequate results.

raum:planen tries to make amends in this regard by combining the web2.0 world with spatial representation of real world planning data. In terms of the spatial citizenship context (GRYL et al. 2010), it refers to the competences in the technical and communicative domain. The project develops a platform using ArcGIS Explorer Online to provide independent and individualized access to spatial planning information held by the state government. Collateral information includes nature conservation areas, risk management plans, land use planning and zonal mapping. A suite of project materials consist of a technical solution to access the information as well as a set of ready-to-use suggestions to devise locally transferable problem based learning environments. The idea here is to allow teachers to link into the individual experiences of pupils.

Overall emphasis is given to spatial communication and participation as citizens. Students thus get prepared for their prospective roles as critical citizens and decision makers.

Fig. 1: Collaboratively assessing spatial planning data

2 Making Planning Data Accessible through ArcGIS Explorer Online

ESRI ArcGIS explorer online is a free Web site for working with maps and other types of geographic information. The user gets the possibility to create maps; find and use maps, applications, and tools; and share the maps and applications with others. A query builder allows filtering certain data. ArcGIS Explorer Online is similar in appearance to the desk-
top version of ArcGIS Explorer, and has some of the same capabilities in terms of communication and sharing of data. To use ArcGIS Explorer online, the installation of Microsoft Silverlight (free of charge) is necessary. Users can add data connecting to an ArcGIS Server and share with other users.

A presentation mode has also been included allowing to present the data you have been working with professionally. The platform provides a platform for creating, sharing and communicating content easily and efficiently. ArcGIS Explorer online is available for everyone.

We developed a platform on ArcGIS explorer online to perform an independent and individual access to spatial planning information for the province of Salzburg in implementing Web Map Server (WMS) data services provided by the department of spatial planning of the province of Salzburg. WMS is an OpenGIS Consortium specification for an online service that provides maps in a number of standard image formats, including .jpg, .png, .gif and .tiff. WMS provides a standard for the provision of transparent map image data, allowing data from many different sources to be overlayed and delivered to client programs as an integrated map image. This type of data was used after reaching an agreement with the state government of Salzburg on free access to the SAGIS (Salzburger Geographisches Informationssystem) data for educational purposes. As ArcGIS explorer online directly has access to SAGIS data, changes in zoning maps will get visible automatically in ArcGIS explorer online.

Fig. 2:   Land use planning data of the province of Salzburg in ArcGIS Explorer online

The information accessed refers to nature conservation, risk management plans, and land use planning. The project raum:planen develops a GI-based learning environment for spatial planning to achieve that students realize the importance of spatial planning in everyday situations. The aim is to analyze different conflicts and chances within an area and to develop and implement concepts, solutions and strategies for the investigated area. Pupils are allowed to anticipate current and potential future problems. It does so by imparting the ability to read, interpret and annotate land use planning (Fig. 1).
Furthermore it intends to reach the students with learning materials simulating participation in the planning process and use additional information sources for that purpose (Fig. 2).

**Fig. 3:** Simulated participation of a planning process

### 3 Pedagogic Concept

One of the basic aspects of the planning act is that citizens, in case of the learning environment raum:planen are encouraged to be involved in the planning process before the plan is adopted through the relevant institutions. It has been argued that spatial planning and learning are in fact very similar processes (JEKEL 2007). Raum:planen therefore explicitly links into the concepts of problem based or case based learning. Problem-based learning (PBL) is an experiential form of learning centered around the collaborative investigation and resolution of complex real world problems (TORP & SAGE 1998).

The experiential part of the learning environment is safeguarded by the spatial transferability of the problem into the local backyard of each school. Comments on spatial for planning spatial planning activities by students are made available online, and are structured through forms of role play. Learning processes are therefore both spatially and socially situated (LAVE & WENGER 1991, SANCHEZ et al 2010).

The learning environment is accompanied by materials introducing each problem to both students and teachers. Each material consists of a short introduction, an information for teachers, a ‘case’ or problem description in the sense of problem based learning, and a tutorial to supplement the problem solving process (Fig. 3). The materials do not only link into the spatial representation (zoning), but also into the relevant law (Raumordnungsge- setz) within another online service, the law information system (www.ris.bka.gv.at). This helps with updating as the law information system is regularly updated once the bill has passed and therefore is up to date. A common design of materials allows for easy usability, while the open format allows teachers to adapt materials to specific needs and localize these.
The contents of the materials should reach beginners in spatial planning with introduced examples as well as advanced pupils (secondary education) who can attend special case studies.

Fig. 4: Material description for teachers and students

Materials have been developed for the following topics:

- introductory module (introducing spatial planning and platform use)
- Spatial planning and economics (based on the decision for a manufacturing site)
- Spatial planning and nature conservation (based on conflicts for enlarging skiing areas)

Further materials can be developed and published by both project staff and teachers.

### 4 Conclusion and Outlook

In summary ArcGIS explorer online is a capable online platform to develop an interactive learning environment on spatial planning, participatory decision making and geovisualization. It allows students to participate in spatial planning processes by using a new web interface. It offers tools where students directly can link to materials, create presentations, share the results with colleagues and its easy to work with.

In future we will also consider alternative platforms (e.g. google earth, scribble maps) to appeal a wide range of teachers and students.
While the solution including an online platform is much more simple to handle than older full industry strength GISystems and the difficulties acquiring data, specific education needs for teacher training still remain. The first is rather short introductions to the system which in case of this learning environment is imparted through the competence center for didactics, digital:earth:at. This includes the technical expertise to handle the learning environment the ongoing development of additional case studies and the online publication of these materials for free use. The second need for teacher education is for more constructivist approaches in teacher education in general, and regarding spatial planning in particular. If we consider spatial planning as a learning process, then we may find out that there are no ready-made solutions to a specific planning problem (JEKEL 2007). Following this idea, new methods for the evaluation of learning processes have to be devised that look into stringency of argumentation rather than ‘true solutions’.

The main goal of this project is to provide data and make it accessible for a wider public. It aims at generating interest in participatory spatial planning, and to enable the public to communicate professionally in these planning processes. Recent developments and political events show that participation is again on the agenda. To teach communication with adequate GI tools in this respect means empowering citizens.

Participation through this platform is possible in all places in Salzburg as well as worldwide. It is expected that similar platforms will be used beyond the classroom in near future.

Thanks

The project has been developed in cooperation with the Salzburg Department for Spatial Planning, the state education authority Salzburg, the centre of didactics digital:earth:at. as well as the Salzburger Institute for Planning (SIR). It has been funded by Abt. 7 (Spatial Planning), Salzburg state Government.

References


