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Geomedia Skills – a Required Prerequisite for Public Participation in Urban Planning?

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1 ABSTRACT

In recent years, the way we communicate and exchange information has undergone tremendous changes. Among other aspects, this is triggered by rapid advances in modern ICT. Meanwhile, communication processes, which are increasingly Web 2.0 mediated, enable reflective and participatory practice, and the use of geomedia (i.e. supporting geovisualisation and geocommunication). Besides, influencing work life and private life, this has also impact on the field of civic responsibility (a core element to democratic societies). A prominent example therefore is the involvement of citizens in urban planning processes. For participatory urban planning the use of Web 2.0 tools, closely linked to geomedia use, opens up a wide range of opportunities in all planning process steps. This encompasses activities related to providing information, consultation, collaboration, and taking part in decision making.

The handling of geomedia – and thus being able to contribute to urban planning processes – requires for particularly skilled citizens, who currently are mostly missed in society. While school education has recently started to consider geomedia competencies as an essential topic, opportunities for such empowerment for adults barely exist. However, to allow planning processes to benefit from ICT and geomedia use, suitable activities in the field of adult education and learning need to be established. Facing this gap, this paper discusses the topic of how adults can become spatially prepared, i.e. how adults' geomedia skills can be developed and strengthened with the intention to permit them to participate in urban planning processes.

2 INTRODUCTION AND BACKGROUND

Today, cities and urban areas get increased attention all over the world. Topics such as rapid urbanization (e.g. Sao Paulo, Brazil), discussions about smarter cities (e.g. Amsterdam, The Netherlands), the need for green cities (e.g. Chicago, USA) and sustainable cities (e.g. Vancouver, Canada), as well as urban deconstruction and reconstruction (e.g. shrinking cities like Leipzig, Germany) provide various challenges for urban planning.

Urban planning, i.e. city planning, is a special branch in the spatial planning domain. It is concerned with settlements and related spatial arrangements, and determining the conditions for the location of structures in urban space. It is widely acknowledged that successful urban planning processes generate economic growth, social and environmental harmony, political advances as well as scientific progress, while missing, poor, or unfavorable urban planning causes social exclusion, poverty, uncontrolled urban sprawl, and environmental problems (UN-HABITAT 2008; URL 1).

Carried out by experts such as (urban) planners, architects, and geographers, urban planning makes use of particular frameworks such as the strategic planning process. These processes consist of several steps corresponding to generic problem solving procedures: They begin with problem definition, involve various forms of analysis, and finally move to prediction and solution design. To solve the problem they also take into account and evaluate alternatives (Hall 2002).

Over the years the way spatial planning processes are conducted changed. Randolph (2004:16) points out: "(…) public participation grew in the 1970s, communication became the emphasis in the 1980s, and the 1990s saw more collaborative approaches involving stakeholders and partners reasoning together."

Thus, pivotal elements, which meanwhile are increasingly linked to urban planning processes, and which open up numerous opportunities are

(1) the involvement of the general public (public participation);

(2) the integration of modern information and communication technology (ICT), i.e. Web 2.0 tools; and

(3) the use of geomedia.

2.1 Public participation and (urban) spatial planning

Today public participation is broadly accepted as a paradigm in support of sustainable spatial planning as well as urban planning. Due to the specific circumstances found in cities, urban planning, more than other planning branches, relies on collaboration between various groups. This encompasses people in authorities, planners, and the general public (Jiang, Huang & Vasek 2003). Advantages refer to give consideration to the multifaceted and oppositional demands made by a growing and highly-divers city population, to become aware of existing conflicts, and to make better-informed and well-grounded decisions.

In doing so, it has proved especially advantageous to involve citizens in all tasks and steps appertaining to urban planning processes: Throughout the entire process citizens can be allowed to contribute, comment, amend, and evaluate information (Jankowski 2009; Renn et al. 1993). Following the so-called ladder of participation this can take on different levels: level 1: inform; level 2: consult; level 3: involve; level 4: collaborate, and level 5: empower (IAP2 2007). In consequence, many urban planning initiatives and projects see citizen participation to be a pivotal element (see e.g. URL 2).

2.2 Public participation and the development of Information and Communication Technology (ICT)

Due to the rapid advance in ICT in recent years, tremendous changes were generated in the way the general public can become involved in planning projects (Ramasubramanian 2010). As presented in Table 1, therefore digital media provide various opportunities (Da Trindade & Wehrhahn 2010; Milovanovic 2003).

	One-way communication	**Two-way communication**			
	Inform	**Consult**	**Involve**	**Collaborate**	**Empower**
Objectives	To provide the public with balanced and objective information to assist them in understanding the problem, alternatives, opportunities, and solutions.	To obtain public feedback on analysis, alternatives, and decisions.	To work directly with the public throughout the process to ensure that public concerns and aspirations are consistently understood and considered.	To partner with the public in each aspect of the decision including the development of alternatives and the identification of the preferred solution.	To place final decision-making in the hands of the public.
Techniques	Fact sheets Open houses	Public comment Surveys Public meetings	Workshops deliberative polling	Citizen advisory committees Consensus-building Participatory decision-making	Citizen juries Ballots Delegated decision
ICT Example	(Basic) Web sites	On-line polls	On-line discussion forums	On-line services, forms & documents in electronic form	On-line decision making support systems

Table 1: Spectrum and technics of public participation (Hennig & Vogler 2011)

Benefits of incorporating modern ICT in planning are numerous and well-known. Some examples are: a large number of people can get involved in discussions, the exchange of ideas, and in opinion surveys without attending meetings personally at fixed times (bad timing) and fixed locations (far away; bad connection to public transport etc.); the speed of communication between the interested persons can be increased; and the quality of communication can be improved given that quiet, reserved, and less eloquent persons get the possibility to contribute. As highlighted by Jiang, Huang & Vasek (2003) and Milovanovic (2003), better planning results emphasize the positive effects of using according tools. Hence, for planners demand is growing to apply new communication tools allowing for public involvement via Internet (Devisch 2008; Evans-Cowley 2010).

2.3 Geomedia, geovisualisation and geocommunication

Owing to the spatial reference of its objectives, the use of geomedia always plays a central role in spatial planning, in which it considerably improves decision-making (von Haaren 2004). In the context of public

participation the use of geomedia must be underlined as important media for visualization and communication, i.e. geovisualisation and geocommunication (Sieber 2006).

Broadly defined, geomedia denotes any digital information or media that provides a spatial reference. This spans a wide range of representation forms including simple verbal descriptions (e.g. route descriptions), complex digital maps (web maps, digital globes), and spatial data. Further, it comprises location based services and location based communication via spatialized social media platforms (Gryl et al. 2010).

Geovisualization refers to a set of tools and techniques that support spatial data analysis through the use of interactive visualization. By this means, geomedia is communicated in ways that, when combined with human understanding, data exploration and decision-making processes are assisted. Particularly relevant therefore are interactive digital maps: While traditional, static maps (i.e. analog or paper maps) have a limited exploratory capability and the graphical representations are inextricably linked to the data beneath, owing to the use of appropriate functionalities interactive, digital maps allow for extended ways to discover the visualized map content. This relies e.g. on the ability to explore different layers, to navigate a map (zoom, pan), and to change the visual appearance of a map (Jiang, Huang & Vasek 2003; Jiang & Li 2005; MacEachren et al. 2004; MacEachren & Kraak 1997).

Geocommunication is characterized by the use and combination of different types of multimedia elements (text, photo, image, animation, audio and video file etc.) as well as geomedia. In doing so, geomedia is accompanied by explanations and multimedia elements in order to clarify the presented content and give context (Hennig, Vogler & Jekel 2011). At that, a high number of users can collaborate in production and consumption of according features (so called collaborative mapping), employing interactive functionalities provided by computer-based tools (Brodersen & Nielsen 2006; Jobst 2009).

Tools leveraging the power of geomedia (i.e. geovisualisation, geocommunication) in the scope of participatory planning are numerous. Applications used are e.g. simple web mapping tools (allowing for collaborative mapping; e.g. Google Maps, Bing Maps, ScribbleMaps, ArcGIS online, Open Street Map); PP GIS (public participation geographic information systems) developed to benefit from user generated content (i.e. volunteered geographic information); specific social media platforms (allowing for discussions between different actors using text, geomedia and multimedia in a combined way); and geoportals (user interface to spatial data infrastructures; INSPIRE, Open Government Data).

2.4 Arising needs in the framework of public participation, modern ICT and geomedia use

Due to the above outlined changes (concerning public participation, modern ICT, and geomedia use) the spatial planning domain faces several challenges: (1) to elaborate suitable methods and techniques to support participation; (2) to provide appropriate software applications; (3) and to meet the demand for adequately prepared citizens being able to participate in planning processes leveraging ICT and geomedia. Even though in recent years, great attention was paid to the first topics, the last one often and still is left behind.

While pupils through changing school curricula including new teaching concepts and materials are more and more empowered to competently use geomedia, a gap exists on strengthening adults' geomedia skills. However, adults are generally the ones asked to contribute to and to participate in spatial planning processes – as well as to other civic responsibility tasks. In this context, there are still many open questions: 1) How spatially enabled is our society (focusing on Austria)? 2) Which skills are needed to handle geomedia competently (i.e. regarding participatory planning)? 3) How can the public become spatially prepared, i.e. how can adults become skilled geomedia users?

The work presented in this paper is based on experience gained in two projects: "Geomedia 50+" and "AccessibleMap": The "Geomedia 50+" project was carried out in cooperation with the program "University 55-PLUS" (Paris Lodron University of Salzburg; URL 3) and the European network "digital-earth.eu" (URL 4), which supports the exchange of experience and the elaboration of adequate teaching materials. This project focused on specifying competence needs to allow for skilled geomedia use; assessing experience on geomedia use on the part of the general public; and designing an appropriate workshop (including courseware) to endow adults with geomedia skills. The "AccessibleMap" project funded by the Austrian Federal Ministry of Transport, Innovation & Technology within the Benefit program (URL 5) aimed at developing and improving the use of interactive, dynamic web maps according to the requirements of the visually impaired people as well as the elderly.

3 SKILLS ENABLING GEOMEDIA USE

Geomedia empowerment of adults asks for a general understanding of therefore required skills. During the workshop "Geomedia 50+" (first lessons) according aspects were revealed through group discussions with and observation of participants using geomedia and modern ICT. This, on the one hand, allowed for identification and categorization of necessary skills. On the other hand it provided insight into the existing level of geomedia skills amongst the participants. Box 1 gives an overview about selected socio-demographic characteristics of the workshop participants.

Number of participations: 19 (13 finished the course including performance record)

Gender distribution: 14 male and 5 female participations

Education level distribution: 2 hold a Phd degree, 2 hold a diploma's degree (equiv. to M.Sc.), 2 hold a secondary school leaving certificate equiv. to high school, 13 hold a secondary school leaving certificate equiv. to junior high school

Age distribution: 55 to <60 years: 5; 60 to <65years: 4; 65 to > 70 years: 7; 70 to >75 years: 2; 75 to >80 years: 0 and older than 80: 1

Box 1: Selected socio-demographic information on the workshop participants

3.1 Geomedia skills

The competencies needed to allow skilled geomedia use are numerous. Due to the information collected in cooperation with the workshop participants, these skills can be grouped under three categories:

- skills relevant to handle geomedia (produce, use, share, reuse etc.),
- skills relevant to use common Web 2.0 tools, and
- basic (digital) cartographic skills, i.e. knowledge.

These categories and the associated skills are presented in Table 2 and outlined shortly in the following.

Geomedia skills and related tasks & topics

Geomedia skills and related tasks & topics	
ICT / Web 2.0	Register and login
	Publish, share, embed (using different web 2.0 applications)
	Work in a cooperative way
	Use of multimedia (find/create images, URLs, video/audio files; insert, embed, share, these)
	Internet safety issues including topics such as intellectual property rights, and data privacy
Geomedia abilities (focusing on web mapping tools)	Use digital maps (find, open, zoom, pan, explore)
	Create maps and features (markers, lines, areas)
	Add further information (using information windows)
	Handle data files (import, export, transfer)
	Output maps (print, save, export, embed)
	Re-use data (find data, assess data, integrate data)
Geomedia capabilities	Cartographic design: adequate symbology, map picture, background map, use of multimedia
	Multimedia use (transfer data, post, comment)
	Critical refection on the power of maps

Table 2: Categories and associated skills related to competence needs concerning geomedia use

Non-professional geomedia handling – as it is the case within the framework of participatory planning – bases, among other things, on the use of different types of Web 2.0 tools.

First of all, Geomedia handling asks for the ability to manage web mapping tools and other tools related to geovisualisation and geocommunication. Users must be able to find and open maps, explore maps (by the help of using navigational tools, legends, context information available in information windows or balloons etc.). Beside these basic tasks, users should know how to create own maps and data, i.e. map features (point, line, area), how to import and export data (concerning topics such as data file formats, converter tools), how to add multimedia information (using e.g. information windows, inserting links and images), and how to output and re-use data and maps.

Besides web mapping tools, social media tools (e.g. blogs, forums, social media platforms etc.) play a pivotal role. These Web 2.0 applications allow for publishing and embedding of map objects as well as commenting and discussing on the (geovisualised) content. They require from the users to be familiar with the basics of the principal Web 2.0 philosophy and its main concepts: user collaboration, participation, and interaction. Hence, being able to conduct tasks related to social networking services (SNS) is a prerequisite (Ebersbach, Glaser & Heigl 2011; Richter & Koch 2008): It includes (1) identity management (creating a user profile including access rights; group memberships etc.), (2) expert finding (using different search criteria such as name, interest, company etc.), (3) context awareness (awareness of a common context with other people; essential for successful collaboration), (4) contact management (maintenance of the personal digital network), (5) network awareness (awareness on the activities and status of the members of the personal network and on current changes), and (6) exchange (directly e.g. by instant messaging or indirectly e.g. via bulletin boards).

The purpose of communication is to effectively send a message to the receiver rather or the (map) reader. In doing so, information must be transmitted in a way that people without great knowledge of a subject can perceive and understand the presented subject and can create a pertinent idea of it. To facilitate this, the used media must show and/or explain an object or phenomenon in a vivid and reasonable manner. Use and design of either a single communication medium or a combination of several diverse media is generally based on the functions that the media has to accomplish/fulfill in the communication process (see e.g. Hake, Grünreich & Meng 2002). This requires certain skills and knowledge on cartographic design and multimedia use.

3.2 Level of geomedia skills

Concerning the above mentioned skills (see Table 2), users' knowledge and background vary strongly. This also relates to general computer, Internet and ICT use experience.

A certain level of basic ICT skills (including computer and Internet use skills) constitute the fundament for any competent geomedia handling. It encompasses the use of data, applications, and devices (Möller 2006). While today's young people are described as digital natives (URL 6), most adults lack such native understanding of ICT, Internet, and computer use. Moreover, related skills vary considerable among adults. If not using ICT as part of their working life, these users – particularly the elderly – often show weak or no ICT background at all. Thus, for instance, through surveying and observing the workshop participants it become obvious, that most of them face serious problems in registering for web applications (login), searching the Internet, embedding multimedia elements (e.g. images), and inserting hyperlinks. This is even more true for aspects concerning the use of geomedia. Besides experience to plan a route (using e.g. Google Maps), participants, more or less, were not at all familiar with geomedia handling.

4 CONSEQUENCES AND SOLUTIONS FOR PARTICIPATORY URBAN PLANNING

While participatory urban planning benefits from geomedia use, not only the data and the associated tools are a subject of interest. During the last years they deserved great attention in the context of discussions about spatial data infrastructures (SDI), Open Government Data etc. However, it is not enough to provide user-centered tools and applications if users miss the required skills. Hence, it is equally relevant to enable the public to competently handle geomedia in order to bear their civic responsibilities and duties.

For this, interested persons request support. Solutions accompanying the particular planning process are e.g. (1) help, additional information, and tutorials, (2) e-learning material, (3) webinars, (4) blended learning initiatives, and (5) face-to face workshops, which might integrate all mentioned aspects if needed.

Here, to realize adequate solutions, approaches on GI-education as well as adult education and learning deliver suitable background information. A practical example on how to integrate according topics for adults' geomedia enablement is given by the particularly designed workshop "Geomedia 50+".

4.1 Relevant education and learning approaches

4.1.1 GI -education

To endow spatial literacy a number of educational approaches, which are summarized under the umbrella-term GI-education, exist. Until now, they mainly focus on secondary and higher education. In this context, two diverging conceptual approaches can be outlined, namely "Spatial Thinking" (NRC 2006) and "Spatial Citizenship" (Gryl & Jekel 2012).

The "Spatial Thinking" approach centers on building up GIS skills and aims at enhancing geomedia abilities in order to face an increasing need of GIS professionals in the current and future working environment. In contrast, the "Spatial Citizenship" approach conceptually argues from an everyday life perspective. It targets at fostering geomedia skills to enable everyone to successfully become part of today's emerging spatially enabled society. Relying on social and social geographic theories (see e.g. Werlen 1993) as well as contemporary citizenship education purposes (see e.g. Bennett, Wells & Rank 2009), the "Spatial Citizenship" approach emphasizes three dimensions (see Fig. 1): 1) basic skills in geomedia handling, 2) competencies allowing for a critical reflection on the power of spatial representations such as (digital) maps, and 3) the competence to communicate with geomedia. This shall ensure to have citizens disposing of relevant abilities and capabilities for a critical, reflective, and emancipatory handling of geomedia in modern geocommunication environments. On the basis of this everyday life embedding, and its focus on (post)secondary education, the "Spatial Citizenship" approach provides a reasonable framework for adult education initiatives concerning geomedia use.

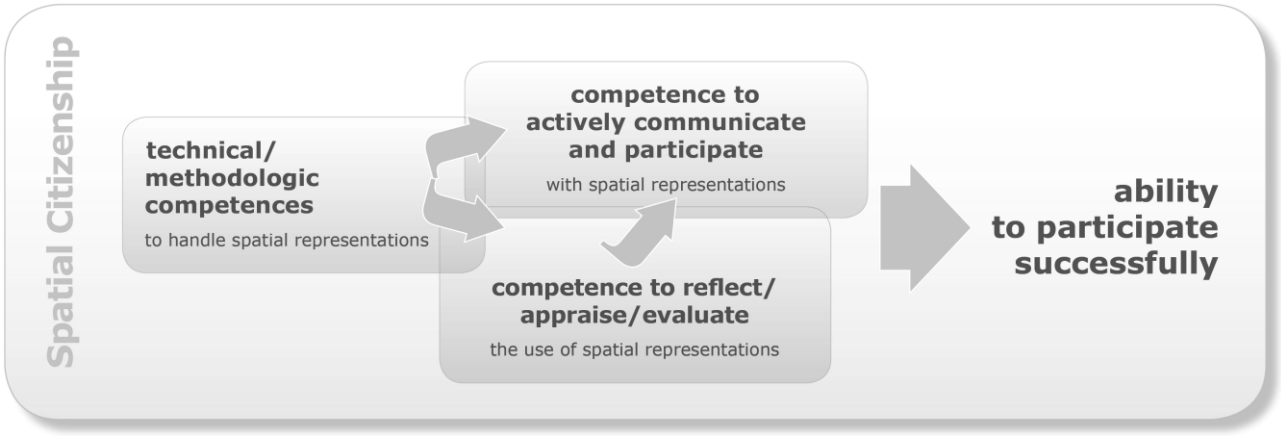

Fig. 1: The concept of "Spatial Citizenship" (Gryl & Jekel 2012)

4.1.2 Adult education and learning

Adult education and learning is considered a strong link in the lifelong learning chain. Recently, it is widely discussed across Europe and steadily gaining importance as it is deemed to have high social and economic significance: It is acknowledged that learning brings equally important benefits for adults' social inclusion, personal fulfillment and development as well as well-being. It enables people to secure an active and constructive role in their communities and in society at large, and can help reduce poverty, health costs and the incidence of criminality (European Union 2006; European Union 2012).

Meanwhile, extensive practical experience and theoretical background on adult education and learning is available (see e.g. Arnold & Pätzhold 2008). General consents exist that adult people learn in a different way from young people: For adults implicit learning plays a central role. They can easily connect new content to already existing knowledge and in consequence have less problems assessing and/ or linking complex topics. Problems are caused by learning under time pressure. Hence, to improve learning outcome it is helpful to give enough time and to recapitulate learning content (BMASK 2010). Ultimately, high quality and attractive adult learning initiatives are most successful (European Union 2012).

As overall concept, support of self-directed learning is essential in adult education and learning. Advantages are numerous: It gives the individual learner greater freedom of choice, it is flexible and it is, by definition, specifically tailored to what learners need (URL 8). Thus, responding to key responsibilities relevant for educators self-directed learning shall target at (1) enabling learners to make informed choices about their development; (2) providing support on an individual, personal level, responding to specific requests for help, (3) providing a range of materials and resources learners can choose those best suited to their personal development needs, and (4) coaching, guiding and assisting learners in using resources and materials to their best effect (URL 8). A selection of principles significant for adult education and learning is listed in Table 3.

Categories	Examples
Action-oriented	Use, tie in with knowledge and abilities of the participants Knowledge on facts and situations Participants ability to decide and judge
Situation-related	Move towards context of everyday life activities Show relationship to everyday life Produce context Experience of the participants
Experience-oriented	Having participants contributing to the course (as co-designer, co-planner)
Science-oriented	Accordance with scientific knowledge
Exemplarity	Course topics as example for other facts and issues Show opportunities for transfer of learning Comparison to other situations

Table 3: Selection of principles significant for adult education and learning (Arnold & Pätzhold 2008; BMASK 2010; European Union 2006)

4.2 Practical example: "Geomedia 50+" – a workshop to build up adults' geomedia skills

The workshop "Geomedia 50 +" (thematically focusing on topics related to Austrian urban areas) was designed and developed based on approaches on GI-education and adult education and learning. The specified list of geomedia skills (see Table 2) was taken into account for the preparation of courseware, the selection of tools, and the elaboration of workshop structure. Selected aspects highlighted in the following sections might provide some guidelines or suggestions on how to face the problem of enabling adults who lack necessary skills to participate in spatial and urban planning processes using geomedia.

4.2.1 Courseware and tools

In order to prepare useful and valuable workshop courseware and to select adequate tools multiple conditions had to be met: It was born in mind that accessibility barriers (might) hamper and discourage participants from the start. As outlined by Neuschmid et al. (2012) and Hennig et al. (2012) – in context with the AccessibleMap" project – this refers to complex computer programs, poorly documented (workflow) instructions, missing additional information (help, user support, glossary etc.), and the use of English language as well as of ICT-specific and planning-specific terms.

Thus, courseware and selected tools not only had to face the situation of varying ICT and computer use background, but also had to consider the need for highly detailed and well-documented training material and description of application use. This allows course participants to (independently) re-pass through learning content and exercises (self-experience). Additional information (access to further information using e.g. links) and exercises support self-directed learning. In doing so, a substantial introduction was given for those characterized by low or no ICT background; those providing advanced background were challenged as they were asked to serve as peer-tutors for ICT-beginners.

Applications belonging to the Google product family were selected to be used in the course. This decision is well-founded: the according tools are easily accessible and usable for everyone (open source, cloud-based storage service); they provide help, tutorials, and user support; and they are available in German language. Further on, they permit to experience a number of different activities related to geomedia handling (see Table 2):

- Google Maps allows users (here: workshop participants) to (cooperatively) create and exchange data and maps. Data can be imported and exported. Multimedia elements and links can be inserted. Several methods exist to share maps with others (send via email, embed in other applications etc.).
- Google Blogger allows users (here: workshop participants) to easily discuss and exchange as well as to publish maps enriching them by verbal information including multimedia and links.
- Google+ allows community building and networking (here: focusing on the workshop participants).
- Google Drive allows sharing of all kinds of documents (doc, xls, ppt etc.) and multimedia elements among a specified community (here: workshop participants). Thus, all materials produced for or during the workshop were made available on Google Drive by both, the educators and the participants.

4.2.2 Workshop structure

The workshop consisted of several units (see Table 4). All course units consist of phases of personal attendance (face-to face contact) alternating with those relying on self-study and self-experience (self-doing). They combine lectures (imparting necessary theory) with exercises (allowing for practical experience). Time for reflection and recapitulation of the learning content was scheduled in all units. Particularly important was to tie geomedia education with every-day life topics and activities as it is the underpinned for general adult education activities (European Union 2012). Following requirements stressed by BMASK (2010), personal experience, knowledge, and interest were integrated, and benefits were drawn from it. Participants were always encouraged to explore existing possibilities of the used applications and to elaborate individual solutions (e.g. project work).

	Units	Content	Purpose
Personal and group/ team support (f2f teaching, group discussions, email, blog, consultation hour)	Introduction	Collecting participants' perspectives Giving theoretical background Gaining some first own practical experience	Gain insight in participants state of geomedia capabilities and abilities
	Sweetener	Visit of GIS day event hold at University of Salzburg	Provide an overview on the wide range of GI/ geomedia Raise interest and awareness on topics in the context with GI and geomedia
	Handling data and maps	Theoretical Background Practical experience	Provide basic functions of geomedia
	Critical reflection on maps and data	Theoretical Background Practical experience	Provide a critical view on geomedia regarding (political) power etc.
	Project work (team work)	Do a project working (related to an everyday situation) based on learning transfer (prepare a digital map visualizing a self-chosen topic incl. data gathering and management, and deciding on the map layout)	Reflection, recapitulation self-experience
	Presentation	Presentation and discussion of the projects	Reflect on the work done

Table. 4: Introduction of the workshop structure

In the course of the workshop a relevant aspect was to consider the motivational set of the adults: While pupils and in part professionals necessarily have to deal with modern ICT including geomedia, since it is integrated in school education or part of their work, the general public misses such external drivers. Apart from needs triggered by e.g. civic responsibilities and duties, theses users must be seen as self-motivation group. This means that on a first look, no obvious sweeteners exist to encourage this target group to deal with modern ICT and geomedia. Accordingly, it is a pivotal aspect to get these people involved: Adults must be aware of the benefits of acquiring geomedia skills. This asks for inspiration and drive to get them to start activities and further to keep on track.

In addition, courseware and tools must strengthen not only skills on tool use or map design, but also personal attitudes relevant for geomedia use. This covers a wide range of topics: trust in yourself – don't be afraid of

using the computer or the Internet; be curious; transfer of learning concerning the use of other tools (e.g. other web mapping tools); and unfurling the changed way of information and communication etc.

5 CONCLUSION

This paper presented some first practical experience collected in the context of building up geomedia skills on the part of adults. Users providing a certain level of specific competencies are a pre-requisite to allow public participation in urban planning processes benefiting from modern ICT and geomedia. This facilitates to take advantage of important resources for today's' urban planning problems. Education initiatives can therefore draw upon existing approaches on adult education and learning and GI-education

However, it became obvious, that to enable adults to competently use geomedia still a lot needs to be done. Besides, discussions on adults' spatial enablement are closely linked to a number of recently emerging concepts: spatially enabled society (see e.g. Enemark & Rajabifard 2011), societies' digital divide (see e.g. URL 9), and e-Inclusion (see e.g. URL 10). This clearly and further underlines the need for spatial prepared citizens.

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