Integration of GITTA e-Learning content into the curriculum of GIScience

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Abstract: *GITTA (Geographic Information Technology Training Alliance) is an e-Learning project, which tries to complement the conventional way of teaching, preferably in a blended learning mode. To students it provides the possibility to extend and recapitulate knowledge taught in class. Originally a consortium of ten Swiss partner institutes created the GITTA lesson pool with every partner agreeing to contribute and utilise e-Learning content. Since the original content development of content is now completed the recently founded GITTA Association tries to find partners outside the initial consortium to build up cooperations, which is considered as an important element of a strategy to ensure the further development and sustainability of the GITTA knowledge pool. GITTA offers a great opportunity for being integrated into GIScience curricula in manifold ways. First, GITTA offers the most comprehensive pool of GIScience education content available in e-learning. Second, the GITTA lessons and case studies are provided as free and open content through the Creative Commons licence. Third, all GITTA content is based on an XML dialect named eLML (e-Learning Markup Language), providing standardised and flexible transformation into different output formats and / or presentation designs.*

1 INTRODUCTION

The GITTA e-learning project (www.gitta.info) has been funded by the Swiss Virtual Campus (SVC, www.virtualcampus.ch) since 2001. It was originally initiated by ten institutes of seven Swiss universities, federal institutes of technology, and universities of applied sciences. These groups formed a consortium, the so-called *GITTA Consortium*. The idea was to

create a pool of GIScience lessons to which every partner contributed specific lessons in their own field of specialization and expertise.

Currently GITTA goes through the final maintenance period, which is still financed by the SVC and will end in July 2008. To take care of the management and maintenance of GITTA resources after the SVC funding will have ended the so-called *GITTA Association* (www.gitta.info/association) has recently been founded. This association will be responsible for further development of the project and will secure its sustainable existence.

This paper attempts to highlight some of the advantages that may arise from the adoption of content of GITTA for GIScience teaching in higher education worldwide. Three aspects of what GITTA is composed of will be addressed, including 1. the content of GITTA, 2. its open content strategy, and 3. the underlying technical framework. We intend to show that these three aspects deliver sufficient arguments for implementing GITTA lessons into academic curricula of GIScience.

2 GITTA CONTENT

GITTA covers a wide scope of GIScience topics. Nearly 50 lessons exist currently, which are organised into thematic modules. Almost every module is subdivided into a basic and an intermediate level. In addition to these modules that focus on conveying the theoretical and technical concepts of the GIScience, a module exists for so-called case studies, in which the practical use of GIS is exercised.

Altogether 6 modules and 1 module for case studies exist. In particular there are lessons within the following modules (Figure 1):

- GI-Systems Module
- Database Management and Systems Module
- Data Capture Module
- Spatial Modelling Module
- Spatial Analysis Module
- Data Presentation Module
- Case Studies

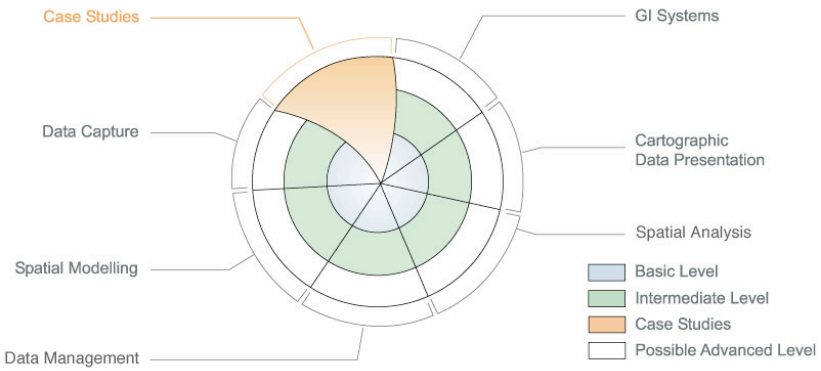

Figure 1: Thematic scope and organisation of the GITTA knowledge pool (WERNER and STERN 2003)

2.1 Languages

Owing to the multilingual background of the original GITTA Consortium, which comprised institutes in the German, French and Italian speaking parts of Switzerland, the GITTA content is available in different languages. Some lessons and case studies are available in English, German and French, some are available in English and German and a few exist either in English, German or French. Although some lessons would still have to be translated into additional languages, GITTA is still a perfect candidate for being used in international curricula, in contrast to other, unilingual e-learning projects.

As can be seen from Figure 1 GITTA covers all elementary fields of GIScience and Technology. To embed GITTA content into teaching it doesn't need more than a link to the required lesson or the import of an IMS- or SCORM-package into a Learning Management System (LMS) such as WebCT, OLAT or Moodle.

2.2 Pedagogical approach

As can be seen from Figure 2 each thematic lesson consists of different units, which are based on an extended version of the e-Learning concept ECLASS (Entry Clarify Look Act Self-assess Summary), which is originally described by GERSON (2000). The section below on the technical basis of GITTA will explain how the didactical structure ECLASS is integrated into the XML based e-Learning Markup Language (eLML).

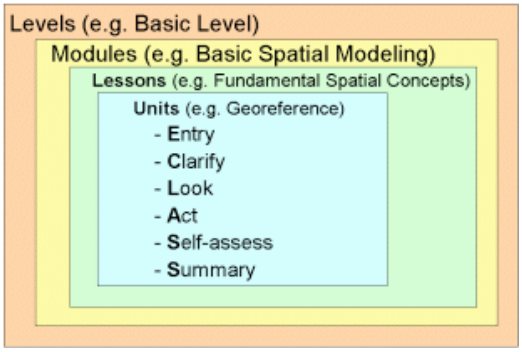

Figure 2: Organisation of GITTA content and ECLASS model (FISLER et al. 2005)

3 GITTA OPEN CONTENT STRATEGY

The GITTA content is freely available. Whilst eLML (see below) is released under the open source license GPL on Sourceforge.net, the GITTA content is published under the Creative Commons license. The original idea of opening both software and content was quite pragmatic: the more people use GITTA in terms of reading, using in teaching, editing, further development etc. the lower are the costs of maintenance and the higher are the chances that the content will be sustainable and survive beyond the funding by the SVC.

In detail the Creative Commons (CC) license allows to copy, distribute, display and use lessons under the following conditions (FISLER & WEIBEL 2006):

1. Attribution (by): It must be apparent that the lessons used are part of the GITTA project
2. Non-Commercial (nc): Only non-commercial use of the GITTA lessons is allowed
3. Derivatives: It is allowed to create derivatives of GITTA lessons
4. Share Alike (sa): The created derivatives (e.g. updated lessons, new lessons etc.) must also be published and made available under the same Creative Commons license ("by-nc-sa")

The GITTA content can be used in two different ways. First, students and

teachers can access the content for free just by subscribing themselves to the GITTA newsletter. They will then receive an email message with the URL that allows free access to GITTA content. Second, individuals or institutions who like to edit or modify the content of particular lessons according to their specific needs or who want to create new lessons, are allowed to do so as long as they become full active members of the GITTA Association. This will grant them the right to contribute their content to the project and vote on the further evolution of GITTA. The GITTA Association acts as a vehicle to integrate new authors who are not part of one of the original members of the former GITTA Consortium (see the bylaws on www.gitta.info/association).

The open source / open content philosophy brings advantages for the adoption of GITTA content into GIScience curricula at external, international institutions. Since the use and modification of the existing lessons is *a priori* allowed, no long-winded negotiations are necessary to arrange for collaborations.

4 GITTA TECHNICAL BASIS

GITTA is based upon eLML, which is an XML dialect. eLML was developed by Joel Fisler and Susanne Bleisch (FISLER et al. 2005; FISLER & BLEISCH 2006) especially for the needs of e-Learning projects. It is now hosted by the Multimedia and E-Learning Services (MELS) of the Computing Services at the University of Zurich and is used for the realization of many other e-Learning projects as well.

4.1 What is eLML?

To explain eLML we should first take a look at the ECLASS concept. ECLASS is an acronym for the terms entry, clarify, look, act, self-assess and summary. In its original, slightly different form, it was developed by GERSON (2000) and describes a concept for how e-Learning content should be organised. eLML is based on XML and contains the elements of the ECLASS model plus additional elements such as glossary, bibliography, or metadata (FISLER et al. 2005; FISLER & BLEISCH 2006).

4.2 Structure of an eLML lesson

Figure 3 shows the structure of an eLML lesson. As can be seen the elements of the ECLASS model compose the structure of the eLML lesson and the units that make up a lesson. The first structural layer of a lesson always consists of an introduction (entry), the learning objectives of the lesson (goals), and the sections which host the main content of a lesson (called units). Additionally a lesson may contain a self-assessment section, a summary, a further reading section, glossary, bibliography, and metadata (providing descriptive information about the lesson such as author, technical requirements, and estimated time needed for completion, etc.).

The thematic units of a lesson may contain an entry section, the goals, a self-assessment and a further reading section. They must contain at least one learning object (LO), composed of a clarify, a look and an act section.

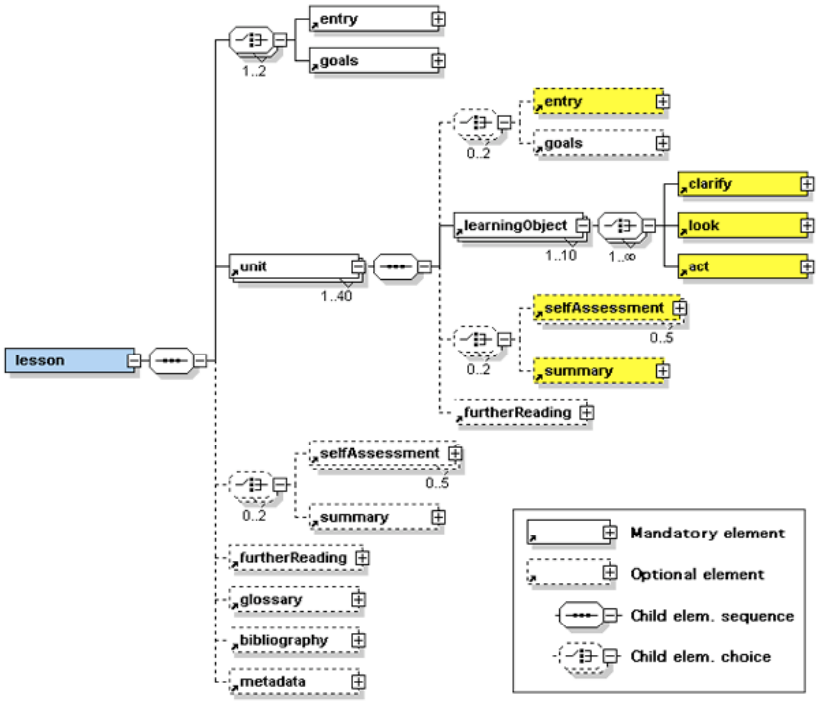

Figure 3: Structure of a lesson in eLML (FISLER et al. 2005)

4.3 Flexibility

GITTA lessons, which have been written in eLML (i.e. XML) must be transformed into a file type that makes it possible to display the content in commonly used web browsers. In this regard many options exist, e.g. the transformation into XHTML or PDF. Also, it is possible to create content packages such as IMS or SCORM, which can be imported into Learning Management Systems such as Moodle, WebCT, or OLAT. Hence, platform independence is truly given, so that GITTA content is accessible to a large, worldwide community.

5 CONCLUSION: WHY GITTA IS ADEQUATE FOR COLLABORATION WITH OTHER INSTITUTIONS

We hope that the above discussion has shown that an integration of GITTA lessons into GIScience curricula at external institutions that did not originally participate in the GITTA project does not imply great efforts. The GITTA content already exists and provides opportunities for adaptation to local requirements, as well as for extension by further lessons and case studies. The adoption of GITTA content does not pose any legal barriers (owing to the simple format of the Creative Commons license). To date, an estimated number of 700 users have already gained access to GITTA content. Furthermore, the technical implementation is made easy by the use of the eLML framework that is based on the XML standard.

We are presently working on the development of a versioning framework that employs a content versioning system (CVS) and that will make it easier for authors internal and external to the original GITTA Consortium to add and track their new or modified lessons and case studies. This versioning framework will have to be in place by July 2008 at the latest, as that will be the point when the project funding provided by the SVC will terminate and hence the GITTA Association will have to fully take over from the original GITTA Consortium. According its bylaws, everybody can become a full member of the GITTA Association, as long as he/she is knowledgeable in the GIScience domain and as long as he/she wants to actively contribute to the maintenance and further development of GITTA content. When may we welcome your application for membership?

6 REFERENCES

[Note: All articles are also available for download from http://gitta.info/website/en/html/about_furtherReading.html]

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