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# **EXCHANGE OF COMPLETE E-LEARNING COURSES – FIRST EXPERIENCES WITH A BUSINESS MODEL**

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**Abstract:** The development and provision of high-quality e-learning courses is expensive and hardly manageable for single institutions. Our approach is to re-use and share existing resources: each partner of a consortium develops an e-learning course, which bases on an existing regular course and teaching materials. Each partner provides this course – including teachers – without charging a fee to the partners' students. In return, each partner receives courses on a non-fee basis. This paper describes first experiences with this business model by providing an English e-learning course of the University of Münster to students at INPE, Brazil, and ISEGI, Portugal. This paper

- a. evaluates practical results of an international exchange of e-learning courses,
- b. validates the business model of a non-fee exchange of e-learning courses,

and provides an outlook on a business model for blended learning.

**Key words:** e-learning, business model, exchange, eduGILLA, blended learning

## **1 Introduction**

In recent years, many funding opportunities on European and national levels resulted in numerous e-learning initiatives. Their success was described, for example, by the contributions to the EUGISES conference 2004. The interesting point was: Successes were reported in papers and presentations; however, most of the obstacles turned out during the discussions afterwards:

- E-learning can provide high-level teaching and learning, although not all expectations were fulfilled, e.g., there is a tendency from pure online-learning to blended learning.
- High-quality e-learning means high costs.
- The years of extensive funding for new e-learning projects are over.
- Many funded project lack a business model for the “time after the funding”.

This paper bases on the facts that “quality costs” and “resources are low”. We backtrack the e-learning problem of costs (section 2), and introduce a case study of the new e-learning business model addressing the “cost trap” (section 3). Sections 4 and 5 describe the first promising results in terms of course performance and return of investment; section 6 draws conclusions. Finally, section 7 provides an outlook on future business models for blended learning.

## **2 Statement of problem**

Is e-learning right for your organization? Answering this question, Anderson (Anderson 2002) reveals the “five Cs” of successful programs: culture, content, capability, cost, and clients. However, we think that also the other “four Cs” can be backtracked to “one C”: cost.

*Culture:*

The study on “Virtual Models of European Universities” (Ramboll 2004) reveals that “the current organizational structures of the universities generally appear to impede ICT (Information and Communications Technology) integration and e-learning in many EU universities”. One of the key obstacles is lacking a respective university culture. Lacking such a culture, an innovative institution willing to introduce e-learning will face high costs. Our own experience revealed a very time-consuming process for gathering the required know-how in organizational, technical, didactical and content e-learning issues without a “quick link” to already existing know-how at the university. In addition, such an experimental phase produces costly mistakes.

*Content:*

The paradigm change from monolithic geospatial information systems (GIS) to interoperable geospatial information (GI) services has an effect on GIScience education. The content of up-to-date curricula needs to be extended, e.g., including legal and business aspects regarding geographic data (Frank and Raubal 2001). This results in a wide range of required educational topics that can hardly be covered by the resources of single GI institutions. In addition, “new GI products, services and ideas are appearing at a rate beyond any one individual’s ability to keep track” and “a significant percentage of GI knowledge, particularly as it relates to the technology, becomes outdated within less than 6 months” (Heywood and Kemp 1997). Keeping course materials up-to-date effects high costs, which is one of the key problems of many e-learning initiatives after the end of the project – and the end of the funding.

*Capability:*

In many cases, single institutions willing to establish an e-learning environment are lacking the required ICT resources (Ramboll 2004). Not having the background infrastructure of a university, a single GI institute will hardly have the financial resources for establishing an e-learning environment on its own. Commercial e-learning environments are expensive, at least for small institutions. Open source solutions do exist, but often do not fulfil the quality criteria or are costly to establish and maintain, especially due to fluctuation of employees.

*Clients:*

Many e-learning arrangements can be considered as “one-way streets”: Despite of the potential, e-learning is often just a digital variation of analogue media techniques (Geißler, Hampel and Keil-Slawik 2004), not exploiting the chance for interactive learning processes. Therefore, in many e-learning environments, the users’ acceptance of e-learning is low. This is one of the reasons for the trend towards blended learning. Technical improvements alone will not enable a more accepted e-learning. Key success factors are motivation and didactical design (Zumbach, Starkloss and Schmitt 2004). In addition, there is not only ONE didactical concept fitting to all students. There is a challenge for “new learner-centered ways to offer students a wide choice of learning tools and a high degree of freedom to adapt the tools to their individual learning style” (Jungclaus, Stephenson and Encarnacao 2004). The elaboration of high-quality didactical concepts and the development of interactive learning tools (vs. the mere provision of pdf-files or powerpoint slides) are not only difficult, but also cost-intensive.

As a result of the significant costs on different levels, single GI institutions will not be capable to establish a high-level e-learning environment. There is a need to develop new business models that enable the development and provision of e-learning courses with reduced resources. This can only be

achieved by re-use of existing resources and sharing resources with several partners. “Therefore it is crucial to foment European educational projects. They can establish partnerships, coordination of resources and actions in the GI sector, as well as improve the effectiveness of public resources” (Wachowicz, Brox and Reinhardt 2005).

Consequently, many e-learning initiatives already emerged. However, they did not match the requirements of our and many other institutions for various reasons (Brox 2003), e.g., fee-based business models are not feasible, or adapting external teaching materials for own use is almost as time-consuming as developing own materials from scratch. Therefore, we developed a new, non-fee business model for the exchange of complete e-learning courses, which is presented and discussed in the following sections.

### 3 Approach: Exchange of e-learning Courses

Within the EC-ALFA-project eduGI.LA ([www.eduGI.net/eduGI.LA](http://www.eduGI.net/eduGI.LA)), we developed a business model with the following key features (Brox, Painho et al. 2004):

- The consortium agrees on an exchange of e-learning courses on a non-fee basis.
- Each partner provides a single e-learning course, in return getting access to six courses of the partners.
- Each course is based on an existing course and available teaching materials, which “only” have to be adapted to the requirements of e-learning.
- Each partner chooses a course topic in which he/she is an expert, which reduces development time and increases quality.
- Each partner provides a complete course including teaching. Ideally, the receiving partner has no more effort than sending a list of participating students, and getting back a list with students’ grades after course execution.
- The consortium uses an existing e-learning platform of one of the partners.

eduGI.LA achieved a prototypical setting in terms of an organizational framework, standards, provision of preliminary teaching materials, and execution of exemplary online-teaching. Thus, the principal feasibility was proven. The currently running follow-up project eduGI.LA II ([www.eduGI.net/eduGI.LA2](http://www.eduGI.net/eduGI.LA2)) targets the implementation of this prototype: each of the seven partners from Latin-America and Europe provides a complete e-learning course to the partners’ students.

The Institute for Geoinformatics (ifgi), University of Münster, provided a course in “Digital Cartography” to ~ 30 students from Portugal and Brazil (see <http://geoinf.uni-muenster.de>). The course is recognized with 2 ECTS credit points, equivalent to a students’ workload of 60 hours. It bases on an existing lecture that works with a standard textbook. New developments targeted online-teaching materials, integration of practical work with a GIS (CommonGIS), self-test questions, and online synchronous sessions.

### 4 Results

The course was performed in Oct-Nov, 2005. An evaluation by students and ifgi staff revealed the following results:

- The e-learning platform was not easy to handle for the ifgi staff, partly because it was new

to them, partly due to usability problems of the (meanwhile changed) platform.

- Teaching via e-learning was new to the teachers, resulting in didactical difficulties, e.g. in the execution of online sessions.
- Students were content with the teaching materials (evaluated with 2.2 on a scale from 1=very good to 5=bad). However, more interactive “teachlets” and improved instructions were required.
- Students were not content with the e-learning platform either (evaluated with 3.6). One reason is that e-learning was new to all students.
- Students requested more interaction with the teachers in terms of more than 3 online sessions during the six-week course.
- Teachers from the receiving institutes supervised the course – not extensively, but the mere contact between German teachers and foreign students was not sufficient.

The overall students’ evaluation was 2.9 on the scale from 1-5, which is not satisfactory. Although the course worked in principle, improvements will be necessary.

Costs for the course development and execution were about 17.000 €, roughly equally covered by EC funding, national funding, and own resources.

## 5 Return on Investment and Value

A question is “how to determine the cost effectiveness of education programs offered online when compared piecewise to the traditional education medium” (Bartley and Golek 2004). A consequent approach would be a detailed calculation of costs, as suggested by Bartley and Golek. But this would exceed the scope of this paper, apart from the difficulties of getting the correct numbers. In addition, our project was not situated in the “free business world” due to external funding. However, we can provide some argumentation for the return on investment:

- ifgi can re-use concept and materials for its own annual course in “Digital Cartography”. Updating this course does not cost more than updating a traditional course. Therefore, apart from the development costs, there are no further follow-up costs.
- Within the ongoing project, ifgi students can attend six cost-free e-learning courses provided by the project partners, and thus get access to topics ifgi does not provide.
- Instead of receiving the e-learning courses, we could have invited 6 guest teachers for one-week block-courses to Münster. Estimating 1.500 € travel costs per teacher, we would have spent 9.000 €.

Consequently, the business model worked already for the duration of the eduGILA II project – although supported by external funding. Looking at a long-term return on investment, the balance will become more positive: There is an option to exchange the same e-learning course again after the project end. Resources will be very limited, consisting of a set of online sessions (parallel to those of the ifgi students), and some supervision of external students, e.g., correcting homework. In return, we would receive a complete course, almost without additional resources.

Beyond the mere cost perspective the *value* of the new e-learning solution can be measured. SkillSoft (SkillSoft 2005) provides four levels of evaluation: business impact, job application and/or implementation, learning, and reaction and/or satisfaction.

On the level of the project's business impact, there are clear intangible benefits for ifgi: Being a small institute, ifgi is dependant on importing external courses in order to improve the quality of the study programs. E-learning is a promising approach for receiving courses by international teachers. By the project ifgi acquired know-how of and experience with this new way of teaching, is capable of evaluating its value, and can develop a substantiated e-learning strategy of its own.

As for the other three levels of SkillsSoft (SkillsSoft 2005), we think quality the most important aspect. According to our evaluation, the quality of the developed course has to be improved. Choosing another e-learning platform does not necessarily increase costs, but other features will: development of more interactive teaching materials, increasing the number of online sessions, and improving the students' instructions for using the platform and teaching materials.

## 6 Conclusions

ifgi was able to successfully develop and execute an e-learning course at low costs. Compared with other e-learning projects, 17.000 € is a very low budget. One of the reasons for this was our approach of re-using and sharing resources: not having an own e-learning platform, we were supported by the technology and know-how of the project partner ISEGI, New University of Lisbon.

Improvements have unlimited possibilities and costs. The integration of a GIS tool substantially improved our course, but the quality of, for example, WEBGEO ([www.webgeo.de](http://www.webgeo.de)), can only be achieved by substantial funding, which is not in sight. On the other hand, ifgi performed an e-learning course for the first time, and the first time always consumes resources. We estimate that both effects – quality improvement and acquired know-how – will balance. Therefore, we calculate a similar cost range for the development of a second course.

In the eduGI.LA II project, the business model worked for the ifgi: the measurable and intangible benefits justified the investment of own resources. And the business model proved the capability to achieve its main goal: providing feasible e-learning with low resources. Therefore, we will follow the same basic approach in another, recently started e-learning project (eduGI, [www.eduGI.net/eduGI](http://www.eduGI.net/eduGI)).

The situation might be different for other GI institutes. However, the basic problem of costs will be the same, and therefore we think that this business model can be useful for others as well. The underlying question is whether or not starting at all or proceeding with e-learning. It is up to each institute to evaluate, if the value of an e-learning environment, including measurable and intangible benefits, outweighs the costs. The business model of re-using and sharing resources might support a positive answer.

## 7 Outlook: Blended learning

Due to many obstacles of pure e-learning – some of them described above – we can observe a trend to blended learning. One of the main obstacles is the interaction between teachers and students, hard to manage via the internet, especially in the field of scientific education and in problem-oriented learning processes.

From the didactical perspective, it is said that the best learning results will be achieved by different media types; more complex media, like online material, should be followed by a simpler medium, like

face-to-face sessions (Simonis 2004). Blended learning combines the possibilities of e-learning with regular classroom teaching. The challenge is to choose the right mix of delivery methods. According to Gray (Gray 2006), a simple learning model follows four stages:

- Initial knowledge
- Increased knowledge
- Ability to apply knowledge in simple situations
- Ability to apply knowledge in complex situations.

We are planning to mix our e-learning courses with classroom teaching. Our approach is to “increase knowledge” and “apply knowledge in simple situations” via online teaching materials and online self-tests. Within these learning stages, e-learning enables students to work according to their own requirements, timing, and intensity. As for “applying knowledge in complex situations”, we consider classroom teaching to be the better option, providing direct feedback and discussions with teachers and co-students. A first test will be performed in the forthcoming semester: An e-learning course in project management, currently developed for the partners of the EC project eduGI ([www.eduGI.net/eduGI](http://www.eduGI.net/eduGI)), will be additionally performed at ifgi in the blended learning mode.

A challenge is to extend the non-fee business model for the exchange of e-learning courses towards the non-fee exchange of blended learning courses. Based on our previous positive experiences with short-term teachers’ mobility measures and existing funding opportunities, e.g. ERASMUS, we think its realization will be feasible.

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