

Development of E-learning Packages in the Blackboard Learning System

Tamas JANCSO, Hungary

Key words: e-Learning, curricula, education, geoinformation/GI

SUMMARY

The paper deals with the principles of organizational, conceptual, networking and business issues concerning the development of E-learning materials in the Blackboard Learning System. The paper demonstrates the theoretical issues through one example for an e-Learning material under the topic of the “Data acquisition and integration” course developed by the University of West Hungary, at the Faculty of Geoinformatics. The paper explains also the idea how to (re)use existing resources by the exchange of e-Learning courses via Internet and it lists the benefits of such kind of action.

1. INTRODUCTION

There are many efforts world wide in the creation of e-Learning modules and learning environments.(Farell 2001) Although e-Learning increases the efficiency of education, the investment of resources is not very effective, many developments are running in parallel. As a first step in the development of E-learning materials is to collect the existed teaching materials of regular courses. The next step is the adaptation to English language if necessary. Finally, bases on the E-learning concept, the material is converted into a digital teaching aid or a complete replacement of existing regular courses.

2. METHODOLOGICAL AND CONCEPTUAL ISSUES

2.1 Course development

2.1.1 Importance of the syllabus

The syllabus as a document with an outline and summary of topics to be covered in a course is a key factor for the success of any e-Learning course (Markus 2004). Within one of the EU project (called eduGI) you can find examples at:

http://edugi.uni-muenster.de/eduGI/e-learning_courses.php

Among the courses you can examine the syllabus of the “Data acquisition and Integration” course:

http://edugi.uni-muenster.de/eduGI/downloads/08/Syllabus_W_Hungary_Data_acq_integration_final.pdf

Generally in the syllabus the following topics should be described:

- Contacts

Giving the full name, photo, e-mail and other data of contact persons. Here the teacher, tutor and administrator positions should be distinguished.

- Goals

This section introduces the aims, learning outcomes, skills, competences, the main topics, methods and principles of the course delivery.

- Contents

Here the course content is described using the structure of “parts – modules – units” hierarchy and the explanation about the characteristics of the material is introduced here as well. It is useful if we try to group the modules into “Parts” by the logic of whether they targeting theoretical, practical or analytical skills. It is a good idea if the modules are divided into smaller parts called learning units. By this approach we give for the students a clear overview about the content and they can plan their activities in smaller portions, which is very useful if we consider that a typical e-Learning student has shorter time at once for a short period only and hence he/she prefers to acquire the learning material in small portions.

- Methods

Here we should list the key issues necessary for the successful completion of the course. Typically here is mentioned the methods of communication and exam, the expected workload, etc.

- Participants

In this section the primary target group as potential students together with the pre-requirements should be described exactly.

- Organization

This part mainly is about the time schedule, indicating the duration, the date of the synchronous sessions, the date of the final exam. Also here is mentioned the planned number of participants.

- Successful participation

In this section the clear regulations for the successful completion of the course are given. Even the list of tasks together with the deadlines can be listed here.

- Course preparation

Here are listed all the steps which are necessary to start the course. Typically it means that we should organize a test of synchronous session and provide (upload) the learning material to the e-Learning platform, or as an option we can provide some off-line materials (books).

- Literature

This section contains the list of the required and recommended literature and other useful optional learning materials.

2.1.2 Course content

If we want to re-use and share the teaching material in an e-Learning environment we have to put some efforts on the conversion and update based on our existing material. Here we can meet the following tasks:

- Adaptation to other language (e.g. Hungarian-English).
- Conversion of plain texts into ppt presentations.
- Development of demo software for carrying out the practical tasks through Internet (for example a program for coordinate transformation between different systems).
- For self assessment we need to work out tasks, assignments. When we think out the assignments we need to consider the amount of time planned for the given module, otherwise the students will not be able to complete each task.
- We need to plan the synchronous sessions and for this we have to prepare special interactive aids (e.g. video, interactive software, usage tutorial, etc.)

An interesting and useful capability of the Blackboard system is that we can integrate the material directly into the system through html pages. The only problem is that the links inside the pages are internal links, and the system generates automatically the pathnames to the linked pages or documents. In practice it means that we are not able to predict the path names because they are changed dynamically and we should rewrite it each time inside the html pages. If we don't do this we receive always the error message: "Parameter is incorrect".

The screenshot shows a Blackboard Learning System interface. At the top, there is a navigation bar with 'NOVA @ Learning' on the left, 'Home', 'Help', and 'Logout' in the center, and 'UNIVERSIDADE NOVA DE LISBOA' on the right. Below this is a sidebar with a menu containing 'Announcements', 'Staff Information', 'Syllabus', 'Course Documents', 'Assignments', 'Communication', 'Discussion Board', 'External Links', and 'Tools'. The main content area is titled 'Modul name: 6. Remote Sensing' and contains the following sections:

- Unit 6. 0.1. Physical Principles**
Author: Małgorzata Veroné Wojtaszek
- 1. Purpose**
In the unit 1 of modul you learn some of the fundamental concepts required to understand the process that encompasses remote sensing. It covers in some detail the first three components of this process: the energy source, interaction of energy with the atmosphere, and interaction of energy with the surface.
- 2. Hardware and software requirements**
We don't need any special software.
- 3. Tasks**
We advise you to read the summary using the reference (Modul6_Unit1_principles.pdf) and see there are some examples. The material is also divided into an separate topics, like electromagnetic radiation, electromagnetic spectrum, atmosphere, interaction with atmosphere and target. If there are any section, which is not clear, please, use the Internet educational sources to get more detailed information.
- 4. Allocated time**
You need approximately 6 hours to review the course material, if the main principles are known. You need 1.5 hours to solve this task.
- 5. Assessment**
You have finished this Unit if you have basic knowledge of remote sensing elements and you understand the process that encompasses remote sensing. It is very important to see what is the connection between them. There are some [questions](#) to help you decide you are ready to start the next Unit.

Below the text, there is a task section titled 'Task: Unit 6.01. Physical Principles' with the sub-heading 'What is Remote Sensing?'. It includes a diagram showing a satellite in orbit receiving radiation from the sun and reflecting it towards the Earth's surface. The diagram labels the sun, satellite, atmosphere, and Earth's surface. To the right of the diagram, there is a text block explaining remote sensing and listing the physical elements of remote sensing:

Remote sensing is the measurement of the acquisition of data about the Earth's surface without contact with it. This is done by sensing and recording reflected or emitted electromagnetic radiation. Remote sensing involves analyzing and applying that information. The process involves the following elements:

- **Energy source** - the first requirement for remote sensing is an energy source which provides electromagnetic energy.
- **Radiation and the Atmosphere** - as the energy travels from its source to the target, it will come in contact with and interact with the atmosphere it passes through. This interaction may take place a second time (active remote sensing) as the energy travels from the target to the sensor.
- **Interaction with the Target** - once the energy makes its way to the target through the atmosphere, it interacts with the target depending on the properties of both the target and

The physical elements of remote sensing: energy source, radiation and the atmosphere, Interaction with the Target, sensing, analysis and application

Figure 2: Course material integrated in the Blackboard Learning System through html pages

3. ORGANIZATIONAL ISSUES

3.1 E-Learning platform

3.1.1 Available tools

An appropriate e-Learning platform for the given e-Learning course should be chosen carefully. Mainly there are two options. A platform can be developed using the available open source tools (e.g. MOODLE) or a license (e.g. Blackboard) should be purchased. Each choice has its own advantages and disadvantages. If a “in-house” way is chosen, there would be necessary to employ not only web masters but also programmers, or at least professionals who can utilize all the aspects of an open source environment, which is typically based on Linux logic. But on the other hand the system can be accommodated for the user’s needs deeply (Markus 2001), (Katz 2002).

If the off-the-shelf version is chosen the operating institution needs only administrators who can operate the system and in this case only the built-in functions can be utilized.

On the other hand I need to add that these systems are well tested and the built-in functions are assuring a stable operation.

The Blackboard E-Learning platform offers the following main tools (see also Figure 2.):

- Communication with the students (e-mail, voice-mail, announcements)
- Discussion board
- Tools for synchronous sessions
- At the course delivery: handling of different file formats like html, ppt, pdf, doc, mp3, etc.
- The assessment facilities like test manager, upload of tasks.
- Course calendar
- Gradebook, course statistics

EDUGI004: Data Acquisition and Integration - Tamas Jancso (Docente)			
Content Areas		User Management	
Syllabus	Assignments	List / Modify Users	Remove Users from Course
Course Documents	External Links	Batch Create Users	Manage Groups
Course Tools		Enroll User	
Announcements	Glossary Manager	Assessment	
Course Calendar	Messages	Test Manager	Gradebook
Staff Information	Content Collection	Survey Manager	Gradebook Views
Tasks	Course Portfolios	Pool Manager	Performance Dashboard
Send Email	Check Collection Links	Course Statistics	
Discussion Board	Copy Files to Collection	Help	
Collaboration	Voice Announcements	Support	Contact System Administrator
Digital Dropbox	MyDropBox Suite (Safe Assignments)	Manual	Quick Tutorials

Figure 2: Control panel of the Blackboard e-Learning platform

3.1.2 Synchronous sessions

The synchronous sessions are the central part of each e-Learning course. At these sessions the students have possibility to ask directly the tutor and it is a good possibility for the tutor to survey the common problems and the opinion of students as well. Here the tutor can explain some parts of the course which are too complicated to describe in off-line manner.

As it was experienced this method of teaching needs a lot of time from the tutor to be prepared for it. Not only because of the students can ask any aspect from the material, but also because of it needs a good practice from the tutor not to lose the main stream in the material, since the students usually ask about those issues which are not discussed in detail in the teaching material. Especially we should avoid those students who want to test the knowledge of the tutor, since it's boring for other on-line session participants who usually want to concentrate instead on the assignment issues.

3.1.3 Final exam

The final exam of an e-Learning course is a sensitive part, since usually the students should be virtually collected in the same time. But in general there are mainly two options for the organization of the final exam. The exam can be organized in the frame of a synchronous session, which is very useful since the tutor can ask to form small groups during the exam asking them to solve more complex tasks. Also the tutor can help the students if they don't understand the task or they stuck somewhere in the practical task. The only negative aspect of this type of exam is that some students - who miss this synchronous session - are not able to pass the exam at all. In this case the tutor should consider the possibility to give a chance to take the exam off-line with the help of the local partner tutors of the student's institution.

The other effective method for the final exam is a test session which is open for a limited time (usually 24 hours). In this case each student can find a time window to complete the test. For those who has no time at all in the announced time-frame, the tutor can allow and assign for each student an individual date for the exam.

4. EXPERIENCES

In the eduGI project (EU eLearning Programme ref. EAC/23/05 DE 011.) eight European GI institutes use existing courses and adapt them to the requirements of the e-Learning course exchange. Each partner contributes one course, to be taught on a non-profit exchange basis with the partners. An e-Learning platform of ISEGI-UNL, Portugal is used. This platform has been successfully providing an e-Learning MSc Program in Geographic Information for more than three years. During a previous work in the ALFA project eduGI.LA (www.eduGI.net/eduGI.LA/) a prototype was developed for the e-Learning course exchange and evidenced feasibility. The organizational framework for execution and recognition of students' achievements was prepared by the cooperation of the eduGI.net consortium (www.eduGI.net).

4.1 Business plan aspects

4.1.1 Common points

A good business model is a crucial part of any e-Learning course (Brox-Riedemann-Kuhn 2006). The members of the eduGI consortium agreed on the standards of all courses by the following:

- English language
- Designed for execution with 30 students, 15 per receiving partner
- Designed for a students' workload of 90 hours
- Implemented on common e-Learning platform, see ISEGI/UNL (<http://www.isegi.unl.pt/ensino/e-learning/default.asp>)
- 13 synchronous sessions ("online-contact-session", 60 – 90 minutes)
- Courses focus on interactive components, e.g., practical software examples, practical problem solving, students' progress controls after each sub-module
- Teaching, supervision, students contact, and final exams in the responsibility of the providing partner
- Quality assurance (criteria to be defined)
 - Two teachers of the two receiving institutes evaluate the course's quality before its execution, based on the course concepts
 - Students evaluate each course directly after its execution
 - Teachers of receiving institutes attend and evaluate at least 1 synchronous session during execution
 - Final evaluation report by teachers of receiving institutes
- Recognition of students' achievements.

The consortium members agreed on that the development of the European e-Learning environment is organized in the following phases:

1. Design (Organizational framework for project cooperation and virtual mobility, preparation of technical platform, raw-concepts of provided e-Learning courses, to be evaluated and decided on a project meeting).
2. Prototyping and testing (provision of e-Learning courses test versions, execution of courses, evaluation of execution, to be discussed and decided on a project meeting).
3. Implementation of e-Learning courses final versions, based on the test results, and exploitation plan .
4. Dissemination of results by publication of results and digital teaching materials, and execution of eight e-Learning workshops.

It is an important issue to mention that the e-Learning environment will be open to all GI institutions, which, in exchange, add teaching materials to the e-Learning platform. The use of teaching materials will be without charge; there might be a small fee for the maintenance of the platform. The copyright of teaching materials remains to the providing institution.

Important part of any business model is to determine the target groups. At the eduGI project the following groups are targeted:

- Teachers/trainers (higher education)
- Students
- Adult learners
- Persons with special needs
- Political decision-makers/administrative staff
- Education authorities
- Curriculum development specialists
- e-learning Industry
- The research community
- Institutes for Geographic Information
- Managers of non-GI institutes targeting the introduction of e-Learning.

4.1.2 Structure and content

The content of each course is organized in modules, and stored in a platform. The platform allows the storage of different types of materials including full courses and other less formal teaching materials. A complete course in the platform can integrate the following items: explanatory text; main text; exercises; data; questions for auto evaluation; project description; final exam, other materials including images and video, and a students' discussion forum. Each course is divided into modules. Each module is typically composed of a text, exercises, auto evaluation, questions (True false or multiple choice). For each module there are three on-line synchronous sessions where students can interact with tutors and have access to demonstrations, summaries and web links. Students have also access to chat within the platform as well as to forum for the program (see Figure 3.).

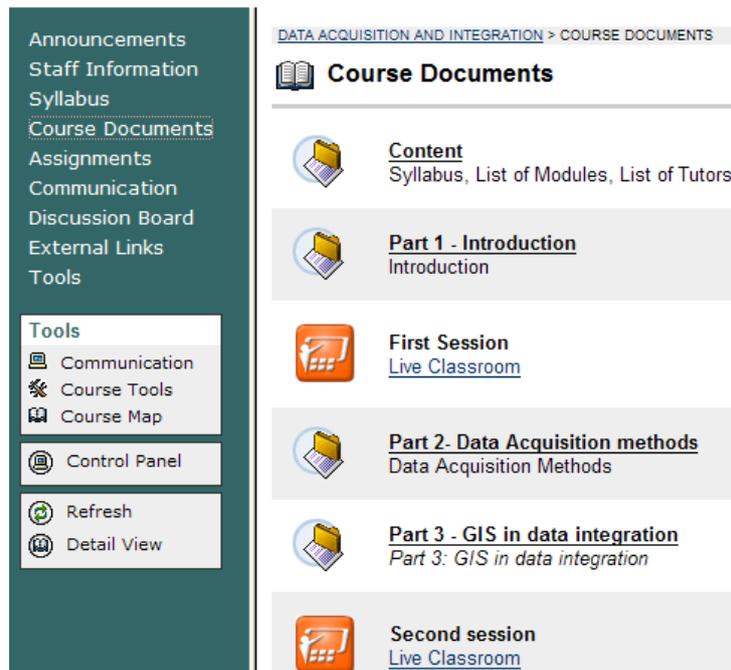


Figure 3: Course documents of eduGI course No. 4

5. CONCLUSIONS

The blackboard E-learning Systems meets all the criteria which are necessary for development and running of effective E-learning courses. Although there are some limitations in the usage:

1. It requires to built into the course fee not only the staff cost but also the license fee of the Blackboard system.
2. If we want to integrate the material directly into the system we will have trouble with the path names connected to the links.
3. The Live Classroom function can be used only with limitations concerning the number of students. We practiced technical problems using audio connection. Practically only the chatting function worked normally. The video conference is not available with this tool.
4. The system doesn't give possibility to install and run external programs. If the tutor wants to run some interactive learning tool as an application, it's available only through his own server or as an alternative, through the "Live Classroom". At our faculty we made experiences of using Citrix servers integrated into an open (free of charge) E-learning portal and it worked well.

ACKNOWLEDGE

The eduGI project (eLearning Programme ref. EAC/23/05 DE 011.) is funded by EU. Acknowledgement is expresses to eight European GI institutes for their valuable participation in the project:

Providing university	Provided course
1. Ifgi, University of Münster, Germany	Project management
2. UniBw München, Germany	GI Standards
3. ISEGI-UNL, Portugal	GeoSpatial Data minig
4. University of West Hungary	Data acquisition and integration
5. ITC, Netherlands	Visualisation
6. Harokopio University, Greece	Geographic Data Bases (Advanced)
7. Uppsala University, Sweden	Virtual excursions in Earth Sciences
8. TU Vienna, Austria	Data quality

REFERENCES

1. Farrell, G. M.ed. (2001): The Changing Faces of Virtual Education, The Commonwealth of Learning, Vancouver, British Columbia, Canada.
2. Katz, R.N. ed (2002): Web Portals and Higher Education, A publication of EDUCAUSE and NACUBO, Jossey-Bass, San Francisco, USA.
3. Márkus B. (2001): Networked education in land administration, FIG Working Week, Seoul, pp. 146-147.
4. Márkus B., 2004: Curricula development in Bologna Process, FIG Working Week, Athens.
5. Brox, C. – Riedemann, C. – Kuhn, W., 2006: Exchange of complete e-Learning courses – First experiences with a business model, Proceedings of the 5th Seminar on GIS Education (EUGISES 2006), Cracow, Poland.

BIOGRAPHICAL NOTES

Dr. Tamas Jancso gained his MSc degree in 1990 at the University of Geodesy and Cartography in Moscow at the Faculty of Aerial Surveying (with honored diploma). Working now as an associate professor and vice-dean at the Faculty of Geoinformatics of the University of West-Hungary at the Department of Photogrammetry and Remote Sensing. Thirteen years of experience in teaching of photogrammetry and photo-interpretation. Staff member in the formation of open and distance learning facilities at the faculty, co-author of two distance learning modules. He has experiences in using digital photogrammetric workstations. In 2006 he gained the Ph.D. degree in the topic of "Photogrammetric application of nonlinear models in geo-environmental sciences".

CONTACTS

Dr. Tamas Jancso, Vice-dean
Faculty of Geoinformatics
University of West Hungary
Pirosalma u. 1-3
P.O. Box 52
H-8000 Szekesfehervar
HUNGARY
Tel. + 36 22 516 543
Fax + 36 22 516 521
Email: jt@geo.info.hu
Web site: www.geo.info.hu