

COURSE 2 –TECHNOLOGIES WEB 2.0

MOBILE LEARNING

DEVELOPMENT, ADAPTATION, TEACHING AND EVALUATION

July 2008

1. INTRODUCTION TO THE M-LEARNING COURSE EXPERIENCE WITHIN TECMINHO

TecMinho has a established learning framework since 2007. The technological framework was developed originally to support the design, implementation and delivery of e-courses that are available through TecMinho e-Learning Centre.

Within the m-learning project TecMinho have updated the learning framework in order to include all mobile learning feactures and needs.

The technologies developed are based on open source software comprising an Educational Content Authoring Tool (eXeLearning) to help teachers create e-learning and m-learning content in an easy way, an Open Educational Resources Tool (DSPACE) to make possible the trouble-free upload of learning content in a standard format and a Open Source Learning Management System (MOODLE)to make easy the design, implementation and delivery of e-learning and m-learning courses.

The project intended to design and deploy an m-course, to provide the project team with the knowledge and practice of mobile learning and e-content design for samll screens and to integrate the necessary tools and systems within the existing TecMinho Learning Framework.

Ultimately, all the knowledge produced by the experts involved in this project will be published in a book with the purpose of disseminating new operational knowledge about mobile to the Portuguese speaking community learning.

2. TECMINHO LEARNING FRAMEWORK

The technical basis for the processes of creation, classification and manipulation of learning content is a computer scheme (framework) that TecMinho developed, adaptable to the learning requirements of each curricular unit of different courses and themes, different learning modes (face to face, e-learning and m-learning) but with a stable and common support structure.

The computer application for the creation of content – Authoring Tool eXeLearning+ was developed for Teachers and it is based on eXeLearning Open Source project developed by a University based in New Zeland. Since 2006 TecMinho is in the process of adopting and adapting this technology for use in its learning courses. Using this technology teachers can create their own content (learning objects) and export it in a scorm format, in a way that content can be easaly deposited in the Content Repository or use by a LMS. The Authoring Tool is based on construtivists educational principals, so it is not necessary to make major adaptations for the many thematic fields and learning scenarios.

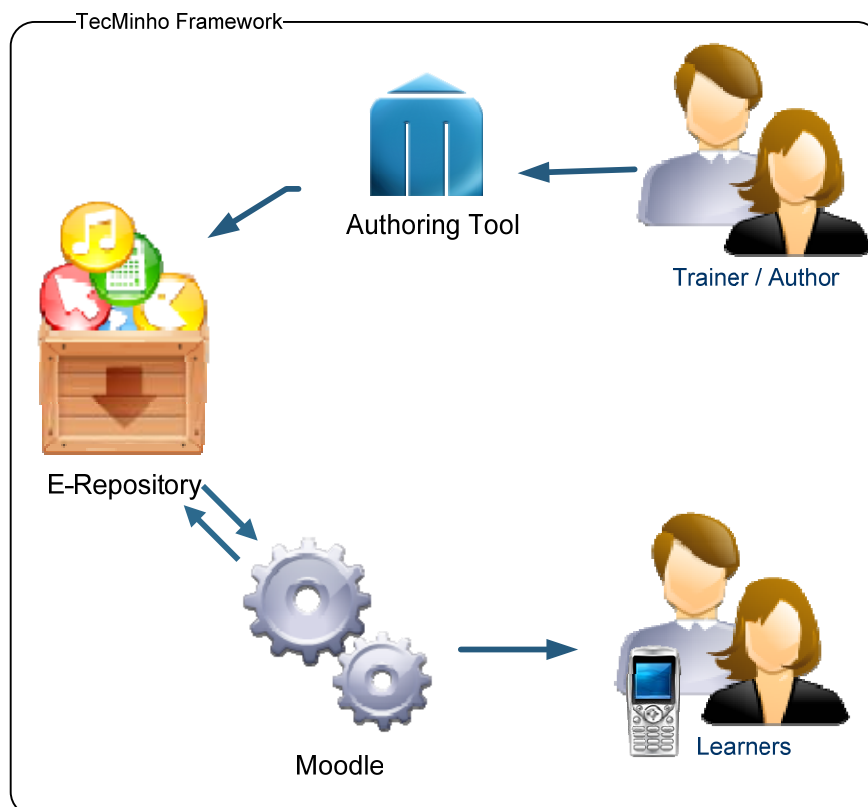
The Repository of Learning Objects is the computer application that will allow the organisation and managment of these “learning objects” that make content adaptable to the various e-courses and m-courses, according to the model of Open Educational Resources (OER). TecMinho LOR Learning Object Repository – **E-Repository** – is based

on DSPACE a Open Source Technology that was originally developed by MIT. This open source tool is used to store the learning objects or artefacts only once! [<http://e-repository.tecminho.uminho.pt>]

The framework is completed by the use of a LMS. As TecMinho infrastructure at the moment is based on Open Source tools, one natural choice as LMS was MOODLE Platform. TecMinho adopted the Learning Management System (LMS) – **Moodle** – in 2004 for e-Learning, b-Learning and to complement face to face training. [<http://formar.tecminho.uminho.pt>]. As a open source project guarantee a level of update on technologies, pedagogies and standards. We must refer that there is already a mobile moodle version available for users with mobile internet, and that will facilitate the process of integrating the access to courses via mobile phones.

The e-trainers/e-authors do not require much knowledge in technology to use the authoring tool, the repository and moodle, which are all tools developed according to “friendly” criteria, thus allowing the teachers to easily develop content in their specific scientific fields.

Content can then be developed in the authoring tool, setting up multimedia learning objects that are classified using a system of metadata (Dublin Core) that can be directly exported to the Repository of Multimedia Learning Objects. This content can then be modeled into courses, packaged according to the norms (SCORM) and integrated into LMS (such as Moodle and Blackboard) in order to offer e-learning, b-learning and even m-learning or class Courses or Curricular Units.



The courses or curricular units can then be implemented into any e-learning platform or m-learning platform (given that the creation of the e-content and the platforms used follow international standards).

The whole development process of e-learning and m-learning courses abides by a set of course design, content design and specification and adequacy procedures to learning contexts.

Mobile learning is seen as an upgrade to TecMinho learning framework shown above, thus allowing users to access courses content and activities using a mobile phone.

Dias (2006) refers that the design of learning that each teacher can develop depends on the quantity of existing independent variables – what knowledge you want to teach, what learning pedagogies can be put into practice and the motivation you can stimulate. In this sense, one can say that the amount of possible “learning designs” is infinite, meaning that we can have a learning design based on case studies involving this or that group of students (according to their learning style), developing collaborative strategies, making available certain sites and/or content, communication tools, etc, or we can have another learning design based on games or simulations or, yet another based on the development of projects or resolution of problems (project/problem based learning). The case studies, simulations, games, exercises, evaluation questionnaires or learning activities designed by the teachers are learning content that must be conceived according to pedagogical assumptions. The use of computer tools facilitates this process but also the use of mobile phones can ease the access of students and teachers to the course anytime anywhere and on the move, so facilitating a real just in time learning..

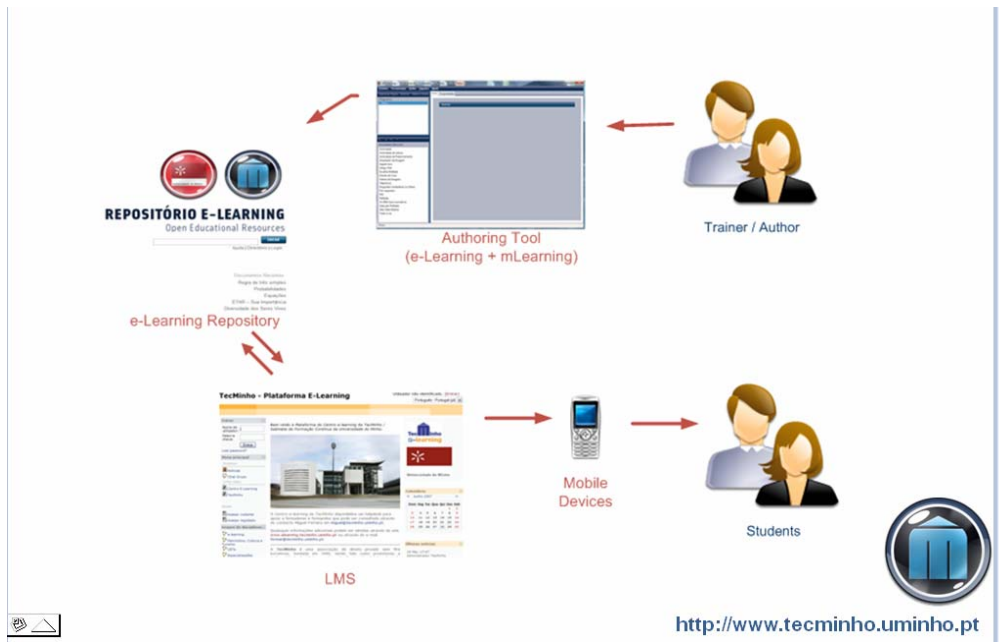
The life cycle of the content begins with the design/conception of the learning content by the author, which in this case is the trainer or teacher.

The author is supported by the Content Creation Tool – eXeLearning+ to design content and to organise the pedagogical path that students should follow. Thus, the teacher should create the content directly onto the authoring tool or re-use the content already available in the Learning Object Repository (LOR). After the content creation the author should attribute the corresponding metadata and can upload content in the LOR in various formats, namely in the “package” format, in the IMS-CP or SCORM specifications. The author can also export the content in “web-page” format.

Uploading Learning objects in the LOR can be carried out directly by using the eXeLearning+, if the user is given the permission to upload. The organisation of content in the LOR repository is carried out through the Dublin Core metadata scheme, which can be directly inserted into the authoring tool eXeLearning+ (metadata option).

Once the learning content is made available on the Repository, it can be accessed from anywhere by accessing the Repository site or by using the single address system (Handle) that allows the “content” to be addressed from any other internet based system.

This aspect will provide the link between the LOR and e-Learning Platforms (LMS). Thus, the trainer does not need to transport/upload his/her content onto the e-learning platform, but rather indicate the “single” address of the content (“handle”) on the platform and his/her content will be automatically included.



3. USING M-LEARNING WITHIN A E-LEARNING COURSE:

For this second pilot project TecMinho team decided to make some changes to the variables in order to measure possible impacts of m-learning.

Variables used in the second pilot course:

- use a similar target group (Public Servents from Local Municipalities)
- experience was carried out with learners from a different area of the country – Lisbon Metropolitan Area (first experience was carried out in the North of Portugal)
- use m-learning within an e-learning course (first experience was in a face to face course)

The course was an e-learning course (professional training) delivered to graduate professionals working in the 18th Municipalities of Lisbon Metropolitan Area. Those are public servants working in the local municipalities of Lisbon area, on both sides of the tagus river (Barreiro, Mafra, Sintra, Cascais, Lisboa, Sesimbra, Seixal, Odivelas, Loures, Oeiras, Palmela, Setúbal, Almada, Amadora, Vila Franca da Xira, Alcochete, Moita e Montijo).

The course aimed to introduce the use of web 2.0 technologies within the professionals working in those municipalities, aiming to create a collaborative environment among the different municipalities.

4. E-LEARNING COURSE DESCRIPTION:

Course title: **Web 2.0 Technologies**

Target group: Professionals working in Municipalities of Lisbon Metropolitan Area.

Course Objectives:

- Understand what are web 2.0 technologies
- Create and maintain a blog
- Create and maintain a wiki based on web 2.0 technologies and related content

Course Modules:

- Module 1: Introduction to the e-Learning Platform
- Module 2: Web 2.0 Technologies

- The course has a duration of one month and it is moderated by a very active trainer. The e-learning course methodology is based on project based learning and each learner or group of learners must develop a task/learning activity every week. Modules learning design, the activities definition and scope and learning evaluation and facilitation is made by the eTrainer. The course was running for one month

wich corresponds to 32 hours (approximately one our of self study and production of activities per day), having started on the 18th June 2008, and ended on the 16th July 2008. The timeshedules is shown below.

		Tecnologias Web 2.0																																				
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		Seg	Ter	Qua	Qui	Sex	Sab	Seg	Ter	Qua	Qui	Sex	Sab	Seg	Ter	Qua	Qui	Sex	Sab	Seg	Ter	Qua	Qui	Sex	Sab	Seg	Ter	Qua	Qui	Sex	Sab							
2008																																						
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p P - PRESENCIAL	O ONLINE
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CONTEÚDO PROGRAMÁTICO: Módulo 1: Introdução ao Curso e à plataforma Módulo 2: Conceitos e ferramentas web 2.0	DURAÇÃO: 4 h (2h presenciais e 2 h assíncronas) 28 h (4 presenciais, 21h assíncronas e 3 síncronas)	FORMADORES: Eng.ª Ana Dias e Dr. Miguel Ferreira Capitão Paulo Simões
Local das sessões presenciais: Universidade Aberta Palácio Ceia, sítio Rua da Escola Politécnica, nº141-147 (Lisboa)	Horário das sessões presenciais: 1.ª sessão: 14h30 - 16h30 2.ª sessão: 14h30 - 16h30	

Chats obrigatórios (10:00h-11:00h e 14:30h-15:30h)

The course was delivered online using TeMinho Learning Framework updated for this project, and using the LMS MOODLE. The course duration was 32 hours, assuming one hour of work per day, corresponding to one month of trainer moderated learning at distance. In this course there were 2 face to face meetings/workshops, one at the beginning of the course and one at the end.

The course learning designed is based on practical activities that are developed every week by the learners, being the trainer responsible for online feedback to the learners supporting their learning progress.

The learning activities are supported by a learning environment, mostly created by the trainer, which includes learning contents and different forums, chats, glossaries and other interaction tools. Using the environment and the trainer instructions the learners have the necessary support to learn. All tasks performed by the learners are delivered online and the learners can view and comment each other tasks and activities, allowing this way an collaborative learning.

5. E-LEARNING COURSE CONTENT:

WEB 2.0 TECHNOLOGIES

MODULE 1: INTRODUCTION TO ELEARNING

4 hours (2 hours face to face and 2 hours online)

Topics discussed:

- MOODLE platform,
- Tools and functionalities: forum, glossaries, agenda, news, chats.

MODULE 2: WEB 2.0 CONCEPTS AND TOOLS

28 hours (4 hours face to face 21h asynchronous learning and 3hours synchronous learning-chat)

Topics discussed:

- RSS – Google Reader and Blogger
- Sharing bookmarks – Del.icio.us
- Wiki's

6. STRATEGIES FOR THE MOBILE COURSE DESIGN AND IMPLEMENTATION

According to the needs of this second pilote experience with m-learning project TecMinho team decided to work out some strategies that should be followed for the project to be implemented with a certain rule and aiming specific results that TecMinho should found from the first pilot experimentation. Thus the following strategies were established:

Strategy1: m-learning to be used as a compliment to e-learning

TecMinho is a provider of e-learning in Portugal. Beeing a new comer to m-learning it was decided that for this project we should integrate the m-learning experience of our trainees with existing e-learning project currently running at the institution.

Strategy2: m-learning content to be downloaded from platform

Some selected contents should be mobilized in order to be available to e-learning student for download from the e-learning platform.

Strategy3: m-learning content to be shorter (summary)

The mobile learning content should be shaped for a mobile phone screen size, with the idea that the mobile phone is a different channel of communication - so content should be different in shape from the content produced to face to face or to e-learning channels.

If the content is text based like a manual for instance, the content of a mLearning module should be more like a "compressed manual" because it will be accessed and read over the screen of the mobile phone. It does not make sense to have long manual or long contents because they are to be used during small slots of time and they should be synthetic and fast to consume giving some added value to the other types of distribution channels.

Strategy4: m-learning content should be used by existing students mobile phones

The mobile learning content should be shaped and organized in a way that can be accessed by the mobile phones of the student. Thus learning from previous experience we should produce contents in html and java and contents that can be easily downloadable to the external memory cards of students mobile phones. Conditions of costs of mobile internet are the same all over Portugal.

8. IMPLEMENTATION, ANALYSIS AND EVALUATION OF THE PILOTE COURSE

After planning and development of materials for the pilote course experimentation, Tecminho have used a questionnaire to be used with the learners in order to measure the success of the implementation (annex I). At the same time in the first face to face class project team members have presented the pilote experience were within this course, besides face to face and e-learning platform use, students would be able to experiment the use of their mobile devices to learn. At the first moment the mobile devices of the students were analysed and the list of equipment that students had was listed.

The typology of the mobile devices of the students were similar to the ones found in the first pilote course (2 PDAs, and 2G phones) so the solutions developed were found adequate for project evaluation and progress.

The questionnaires were very clear concerning students views about the use of mobile devices for training has they all agree that this form of learning seems very up-to-date and very usefull.

Some of the issues that were asked within the questionnaire were related with learners perception about the potencial of this tool and in this case they all agreed that it is a very powerfull tool for learners that are moving within their work. For instance for the learners of Municipal services related to building licencing that are allways on the move.

In some extent this second pilote experience was not very successful due to exactly the same factors we found in the first pilote course:

- The majority of learners have simple mobile devices (2G) rather than smart phones or PDAs
- The majority of learners do not have a connection to internet on their mobile devices because the costs of mobile internet access is still prohibitive in Portugal
- Variety of students' equipment
 - Different technologies
 - Different Operating Systems

- Different Screen Sizes
 - Learners didn't have Wireless equipment
 - Lack of competencies using m-devices

Please note that the learners did not had Internet Access on their mobile phones, due to its high costs in Portugal. As a consequence some of the latest technologies and possible pedagogies for mobile learning could not be tested in this second pilote course to.

In fact having this experience make TecMinho team realise that it is to soon to bring mobile learning to the ground if the target group is not especially selected as a pilote group.

That means that Portugal is still in the level 1 of m-learning, were pilot projects need to be implemented to raise awereness and disseminate concepts. For experimenting this projects there is the need to buy equipments to run the experience.

Another very important conclusion that was underlined in this second pilote experience is that the majority of the students did not add competencies to use the devices. In fact beeing an e-learning pilote course students should download by there own the m-learning contents from the LMS. So only one student could do it alone, the others needed a face to face, instruction led class in order to be able to see contents in their mobile phone.

- Lack of competencies using m-devices
- The learners that have smart phones and PDAs do not have the skills to use their mobile phones properly (for the purpose of downloading content from a website to their mobile phone).
- Face to face instructions and instructor led learning was needed to teach the learners to use their mobile learning content on their devices
- Learners have basic mobile phone and are using basic function (they are able to use SMS and transfer images but not much more.)
- If the mobile content is not simple to use/transfer it is not used.

Notes for further experiments:

- The use 3G equipment with internet mobile together with the use of Mobile Communities
- Internal wireless infrastructure to access internet (now only possible for PDA with Windows Mobile OS)
- Make the experiences with young graduates from the university