BUILDING (E-)LEARNING BRIDGES BETWEEN PORTUGAL AND TURKEY

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Abstract

E-Learning has revolutionized learning as we know it [1]. Shifting beyond traditional mode of education, e-Learning has become an advantage for all learners in general. Further, e-Learning also bridges the gap of learning across borders, emerging as the new paradigm of modern education [2]. With e-Learning, learners can have access to training in other universities and to academic resource materials from other countries, thereby broadening the knowledge base of students. Despite these promising advantages, there are many barriers that face both trainers and trainees within an e-Learning environment [2] [3] [4]. Data show that teachers and trainers have a lack of confidence that surpasses the general optimism in e-Learning [5]. Teachers and trainers indicated that their skills in preparing pedagogical specifications or e-Learning tools are weak [5]. These barriers to e-Learning are very similar across European countries, example of that is Portugal and Turkey. This is a clear finding of the Building (e)Learning Bridges project (Lifelong Learning Programme – Grundtvig Learning Partnerships, 2012-14) [6]. This project aimed to design and test a usable web based protocol to facilitate the creation of effective e-Learning activities [6]. A protocol is generally defined as a set of rules/procedures that should be followed to achieve an outcome. When creating a new e-Learning course these procedures will ensure that all-important aspects of the development process are followed in the appropriate order [7]. Our goal is to give strong guidelines to teachers and trainers that allow them to prepare good e-Learning environments to their students, interactive and pedagogically structured, in order to overcome the barriers to e-Learning that have been found in the scope of the project (including in the literature). This protocol can help institutions adopt e-Learning by overcoming potential barriers, and hence reduce the risk of failure during implementation.

After a first moment when partners identified common barriers to e-Learning, we create an e-Learning Protocol to facilitate the creation of e-Learning courses. With this protocol it was possible to prepare a small-scale 'at distance' learning activity among partners. The first tests were conducted with Portugal targeting eleven adult e-learners in Turkey.

This paper presents the accomplished e-Learning Protocol and the results of the mentioned test activity

Keywords: e-Learning, e-Learning barriers, e-Learning environments, learning across borders, lifelong learning.

1 INTRODUCTION

E-Learning has revolutionized learning as we know it [1]. Shifting beyond traditional mode of education, e-Learning has become an advantage for all learners in general. E-learning's characteristics fulfil the requirements for learning in a modern society and have created great demand for e-Learning from businesses and education (formal and non formal). E-Learning as a learning paradigm is also directed towards Lifelong Learning (LLL) and responds to the challenges of the Europa 2020 strategy as vocational education and training (VET). The EU's Europa 2020 strategy highlights the importance of VET in achieving the goals of social inclusion and cohesion [11]. E-Learning facilitates the access to LLL opportunities to those who prematurely abandon formal education (second chance education). E-Learning approach is user-centred, is accordant to the learner's needs, availability and specific learning rhythm [12]. This methodology breaks down barriers of time and space. It is anytime, anywhere. It is the ideal situation for those who live far from large centres (where schools are), who work during the schools opening hours, those with disabilities who can not relocate to attend school, those who are in secure institutions, to occasional ill people.

Further, e-Learning also bridges the gap of learning across borders, emerging as the new paradigm of modern education [2]. With e-Learning, students can have access to training in other universities and to academic resource materials from other countries, thereby broadening the knowledge base of students.

Despite these promising advantages, there are many barriers that face both trainers and trainees within an e-Learning environment [2] [3] [4]. Data show that there is a lack of self-confidence of e-tutors in spite of the global optimism related to e-Learning [5]. According to CEDEFOP [5] nearly 32% of teachers and trainers consider their own competences as 'weak' and only 17% say they have 'very good' or excellent' pedagogical ICT skills [5]. This feeling of not being prepared is, maybe, the reason why so many teachers who create e-Learning courses just limit to put content online, and don't take advantage of the digital environment. This creates misgivings in students about the virtues of e-Learning, and leads to frustration [2] [3] [4] [13] [14]. As a response, many users stop their online learning after their initial experience, resulting in high rates of attrition [15].

These barriers to e-Learning are very similar across European countries, example of that is Portugal and Turkey. This is a clear finding of the Building (e)Learning Bridges project (Lifelong Learning Programme – Grundtvig Learning Partnerships, 2012-14) [6] http://www.ebridges.eu. This project aimed to design and test a usable web based protocol to facilitate the creation of effective e-Learning activities [6]. A protocol is generally defined as a set of rules/procedures that should be followed to achieve an outcome. When creating a new e-Learning course these procedures will ensure that all-important aspects of the development process are followed in the appropriate order [7]. Our goal is to give strong guidelines to teachers and trainers that allow them to prepare good e-Learning environments to their learners, interactive and pedagogically structured, in order to overcome the barriers to e-Learning that have been found in the scope of the project (including in the literature). This protocol can help institutions adopt e-Learning by overcoming potential barriers, and hence reduce the risk of failure during implementation.

After a first moment when partners identified common barriers to e-Learning, we create an e-Learning Protocol to facilitate the creation of e-Learning courses. With this protocol it was possible to prepare a small-scale "at distance" learning activity among partners. The first tests were conducted with Portugal targeting eleven adult e-learners in Turkey.

This paper presents the accomplished e-Learning Protocol and the results of the mentioned test activity.

2 METHOD

The Building (e)Learning Bridges project (from now on referred by the acronym 'e-Bridges') aimed to design and test a usable protocol to facilitate the creation of effective e-Learning activities, particularly to overcome barriers to e-Learning that arise both within and between countries.

First, the partnership discussed the e-Learning characteristics that were important when sharing e-Learning experiences (e.g. common difficulties, innovative practices, strengths); and created a common e-Learning procedure called the 'e-Bridges Protocol'.

Second, the Portuguese (PT) partner (course provider) tested the 'e-Bridges Protocol' in a small-scale e-Learning activity, targeting adult learners in Turkey. Our method involved a *participatory design* approach [8] where the design team (from Portugal) invited the Turkish partners and eleven Turkish e-learners to take part as co-designers on the design team itself [9], in order to provide the team with knowledge about the specificity of the context where the course would be deployed.

2.1 Data collection and analysis

In and between the project meetings the partners created what they called the 'e-Bridges Protocol'. The protocol incorporated partners' previous experiences with e-Learning barriers, resulting in a blueprint to support and overcome them.

For the testing activity, the first data was collected in a face-to-face session with the PT design team interviewing two e-Learning experts from the Turkish partnership (university teachers), in what we call the "testing phase 1". Together we designed a questionnaire to identify the characteristics of Turkish e-learners, and to what extent learners make use of Learning Management Systems (LMS) and perform online.

Also in this first testing activity, with the support of these two Turkish experts, the questionnaire was delivered to eleven adult Turkish e-learners from the Çukurova University. With the data collected, a small-scale e-Learning activity was designed and developed by the PT course designers, and delivered to the eleven e-learners in Turkey.

In what we call the "testing phase 2", the same eleven Turkish e-learners were auscultated through questionnaires to perceive the benefits of the course designed with the help of the 'e-Bridges Protocol'. The questionnaires were handed to all the learners during a face-to-face meeting, and according to the Turkish experts they can be regarded as representative of the type of learners of the institution.

In the end, the PT course designers were also auscultated through a questionnaire in order to understand the main advantages of a course designed with the help of the 'e-Bridges Protocol'.

Data gathered from the answers to the open-ended questions were coded in an inductive approach for qualitative data analysis [10].

3   RESULTS

3.1   The 'e-Bridges Protocol'

The 'e-Bridges protocol' was designed to provide a set of guidelines for e-Learning course development and presentation that enable the user to understand and resolve barriers to e-Learning that arise between countries (as well as within countries) that effective cross border e-Learning applications can be developed. The 'e-Bridges protocol' also operates within a number of key principles and consists in six stages.

3.1.1   Key principles

The 'e-Bridges protocol's' key principles are that e-Learning course development and presentation should: (i) Be usable by all participants: designer, teacher, and student; (ii) Be relevant to the needs of all participants; (iii) Have a good match between designer and user learner models; (iv) Operate with effective navigational aids; (v) Provide appropriate levels of learner control; (vi) Use understandable and meaningful symbolic representations; (vii) Support personally significant approaches to learning; (viii) Have relevant strategies for cognitive error recognition, diagnosis and recovery; (ix) Match with the curriculum; and (x) Be effectively tested, evaluated and refined as appropriate.

3.1.2   The six stages of the 'e-Bridges Protocol'

a)   Analysis

Focuses on understanding the audience and what they need to learn: What are the characteristics of the target audience? What are their expectations? What are their skills (Their existing knowledge)? Do they have appropriate access to a computer with an effective Internet connection? Can they commit the right amount of time needed for online study? What resources (time, staff, expertise, money) are needed to support the activities, and are the right resources available? What is the learning environment? What kinds of technology are available? Do any students have a disability?

b)   Design

Focuses on selecting the specific subject matter, writing the learning objectives, determining appropriate sequencing of subject matter or skills, and developing possible strategies: What are the learning goals and objectives? Is there any material/resources already available? What delivery methods are currently used to convey content? Have you considered the pros and cons of different delivery options? Have you designed your storyboard (or rapid prototype); have you considered different storyboard applications? What are the steps the learner is expected to follow to accomplish a specific task? How much content will be presented and how will the design draw attention to important information?

c)   Development

Focuses on the creation of the materials (including detailed lesson plans and other resources) that support instructional objectives: What kinds of tools are available to deliver the content? (e.g., videos,

images, text, presentations, animations,...) What kind of virtual platform is available? (e.g., Moodle, Blackboard,...) What kind of physical platform is available? (e.g., tablet, smartphone, desktop,...)

d) Testing

Materials are delivered to the test-training group: gather data about an audience's reaction to the course activities and products/materials; and gather data about problems with course delivery and assess progress.

e) Evaluating

Evaluate the effectiveness of the training materials with feedback from the users. Assess the success of the course: Are the project resources being utilized as planned? Is the course being implemented as planned? Are the intended activities, products, or services being provided? What strategies worked or failed? Is the course reaching the target audience? Which targeted audiences participated in the activities? How extensively is the audience engaged in project activities? What are the participants' reactions to the project activities? Do participants perceive immediate benefits from their participation in the activities? Do they participate in all activities related to the issue? Are the activities effective in conveying the goals? Is the format and design of each activity practical? Are the online activities effective in encouraging a new sense of responsibility and autonomy? What is the learning impact?

f) Refinement

Revisions are made as necessary. All the information previously gathered can be used to re-design the course in order to increase both efficiency and effectiveness. If any significant changes have been made you may consider repeating some previous stages.

The 'e-Bridges Protocol' as described above will lead to an effective and successful e-Learning application. However, experience has shown there still exist many barriers to success, which can arise from learners, tutors, environmental factors, and even cultural and cross-cultural features of the e-Learning environment.

The 'e-Bridges project' has identified these barriers and some of their solutions taking particular note how barriers might change in nature and importance between countries.

3.1.3 Transnational barriers and solutions

In this topic were identified and developed three clusters that can define common barriers to e-Learning: access, clients, and the course itself. In this manuscript we present, among the barriers listed by the partnership, the ones that are related to Turkey, so we can design our e-Leaning course.

a) Access

Access to the course is an important issue when learning is done at a distance, and mainly when it is in another country. Access issues relate to the access to the LMS and the virtual classroom, the computing facilities, the time zone, the quality of the Internet connection.

Access to the virtual training room presents itself in a variety of guises. Actually being able to get into the training room is not always straightforward, particularly in distance learning when the course is made available in different locations or time zones. Course design and presentation needs to ensure that access issues are confronted by both the organisations and the learners. Such issues may be made worse if learners have any kind of disability.

If the course is designed to be undertaken at home, the availability/affordability of home-based computing facilities become more to the fore. In this regard consideration may need to be given to the platform on which the course is presented, the need for specialist equipment, etc. In Turkey the majority of e-Learning promoters use www.myenocta.com; at country level, most probably 60% of promoters use this platform.

In relation to time, across Europe three time zones exist with one to two hours difference between them, that is what happens between Portugal and Turkey (2 hours). The importance of these time differences may become apparent if a course initiator offers some kind of real-time 'help' facility that may not be available at certain times when students/trainers are working.

Many teachers prefer not to work with the technology because of their own lack of comfort with the equipment and the lack of technical support when the equipment fails. One solution to this problem is

to assemble a cross-functional team of people interested in working with the technology, thus maximizing the expertise of the group.

b) Clients

When developing e-Learning solutions, the most common approach is to take clients' vision of the final product as the starting point. By simply 'asking' clients how they wish to 'see' the courseware when finalised, however, this kind of processes often lead to a solution that is focussed on the IT basics of the system rather than on how the system should function according to the clients' needs.

A *client centred approach* to e-Learning courseware development stresses the centrality of the client (learners, teachers, organisations) in the courseware development while, at the same time, recognizing that the courseware development is a mutual learning process that also involves the developer. Thus a *client-centred approach:* (i) Is based on dialogue between the client and the development team; (ii) Is explorative and recognizes that there may already be ways of working/learning in the organization which could be emphasized, and (iii) Does not result in specific design solutions. Rather, it focuses on current and future critical questions to ask, further steps to explore and opportunities to investigate.

From a cross cultural perspective issues that may arise by taking this approach relate to learner characteristics reflect the demographics, learning styles, readiness, and motivation to learn of the target audience. Variables such as learner expectation affect the amount of time, the level of instruction, and the varied approaches that are required. Web-based instruction enables the instructor to individualize learning to accommodate many of the factors. Examples can be developed to appeal to the cultural differences or experience level of many students. Video and graphics can be embedded in the instruction to support visual learners, while audio can support learners who prefer to listen. By providing a range of examples, students adjust the time they need to spend to grasp a concept. A comfort level and easy access to computers is essential if the course will be web-based.

The expected skills and abilities of the learner group will have a strong impact on the course design, content and methodology. All kinds of learning situations require certain pre requisite skills from the learners and it is important to understand the nature of these pre-requisites.

In Turkey, the size and composition of the learner group can impact considerably on the effectiveness of e-Learning outcomes and also the design/methodology of the course. Since a group will always act as a social structure whose behaviour is determined by the individuals within the group, this is particularly important in cross-cultural situations. Some members of the group, for example, may feel inhibited in saying something aloud others may seek to impose their views on the group, etc.

As well as the physical environment and seating arrangements, other factors such as the size of the group influence the group dynamics, and thus the quality and nature of interactions. The size of the group places limitations on the tasks and functions that it might be expected to perform.

c) Course

The quality of the course is a major factor in ensuring a successful learning experience. Courseware that does not meet the user's expectations, from the viewpoints of production and delivery is likely to lead to reduced motivation, satisfaction, and learning effectiveness.

Some content in certain subjects such as History, religion or politics, can be very sensitive to different cultural circumstances. We have had very careful that the sensitivity of the learners is not compromised. In Turkey, religious / political images and material with pictorial content eventually susceptible pornographic connotation can easily break the legislation and lead to lawsuits.

3.2 Testing activities

At the third partnership meeting in Lithuania it was agreed that the two testing phases should be firstly, a 'paper-and-pencil' exercise to assess the effectiveness of the first draft protocol. Secondly a sample e-Learning course will be developed and tested with e-learners, using the updated protocol. The agreed process was for each course designer to design a course for their recipients using the protocol to anticipate barriers and their solutions.

3.2.1 First testing activity

As the first stage is focused on understanding the target audience (Analysis), the PT team (course designers) design a draft of an online questionnaire to be answered by Turkish e-learners. Then, the

two Turkish experts answered the questionnaire, in what in the literature is called "experts playing trainees" (Lencastre, 2012). After a collaborative analysis of the data obtained, some important changes were made in the questionnaire, taking into account the specific characteristics of Turkish e-learners. Here, a simplified version with the objectives of the questionnaire (Table 1):

Table 1 Questionnaire to the target audience.

Group of questions	Questions	Objectives
I – Personal data	• Age • Gender • Educational level • Do you have any disability that could interfere with your learn experience? • Do you work? • What kind of expectations/needs you trying to meet/fulfil?	E-learners characterization
II – Experience with computers/Experience in the use of LMS	• Do you have any experience in the use of computers? • Do you have easy access to Internet? • How would you rate your relationship with computers? • If you have previously used a LMS (Learning Management System) did you find problems in using it? Justify your answer. • What kind of LMS are you familiar with?	Knowing the level of technological experience
III – Preparation for learning at a distance	• How do you usually prepare yourself for learning? • When you use the Internet for studying purposes, you usually … • How do you reserve time to study? • What do you do when you have a doubt and do not have anyone immediately available to help? • Rate your attitude toward reading • Are you motivated for e-Learning? Please justify your answer.	Knowing the personal characteristics to study online

a) Findings

After this validation with the Turkish experts, the questionnaire was sent to eleven adult e-learners in Turkey that would assess our course. Data collected from the eleven responses evidenced:

- Online Turkish learners were between 25 and 28 years old.
- The number of women and men in the courses was balanced.
- Most students taking online courses had Bachelors degrees.
- No one had any disability.
- Nine out of eleven students were workers (employees).
- The expectations with the course were: Gaining experience/Having an education; Having a qualification/certification (e.g., ECVET, ECTS), Finding a job/Improving career.
- All eleven learners responded that they have experience in the use of computers, and also have full Internet access.
- Four students did not have a very easy relationship with computers.

- All students had never used an online platform before; thus it was their first time participating in such a course.
- The majority (9 answers), made a study plan and drew up a schedule to stick to it.
- The majority (9 answers) established a schedule with a daily or weekly routine.
- Search for possible answers and then seeks the help of a tutor / teacher (8 answers).
- Loves to read and believes that it is the most efficient way to study (9 answers).
- All the students were motivated for e-Learning with 2 exceptions. One said that "*Unfortunately I am not motivated because I work and am also married with 2 children and I need to show interest in my family after working*". The other argued, "*I feel myself motivated for e-learning. Sometimes I can't find enough time to study and get into the courses in the platform in the scheduled timetable because I work. That time, I feel myself guilty and unmotivated, but, later on I can follow the courses on the data which is recorded by my e-trainers*".

With these data it was possible to prepare a small-scale "at distance" learning activity to these Turkish students.

3.2.2 Second testing activity

Based on the 'e-Bridges Protocol', and the data gathered form the first questionnaire, the PT course designers project a second testing activity of the protocol itself. The course designers choose the theme of 'e-Learning Pedagogy' for this testing activity (Image 1).
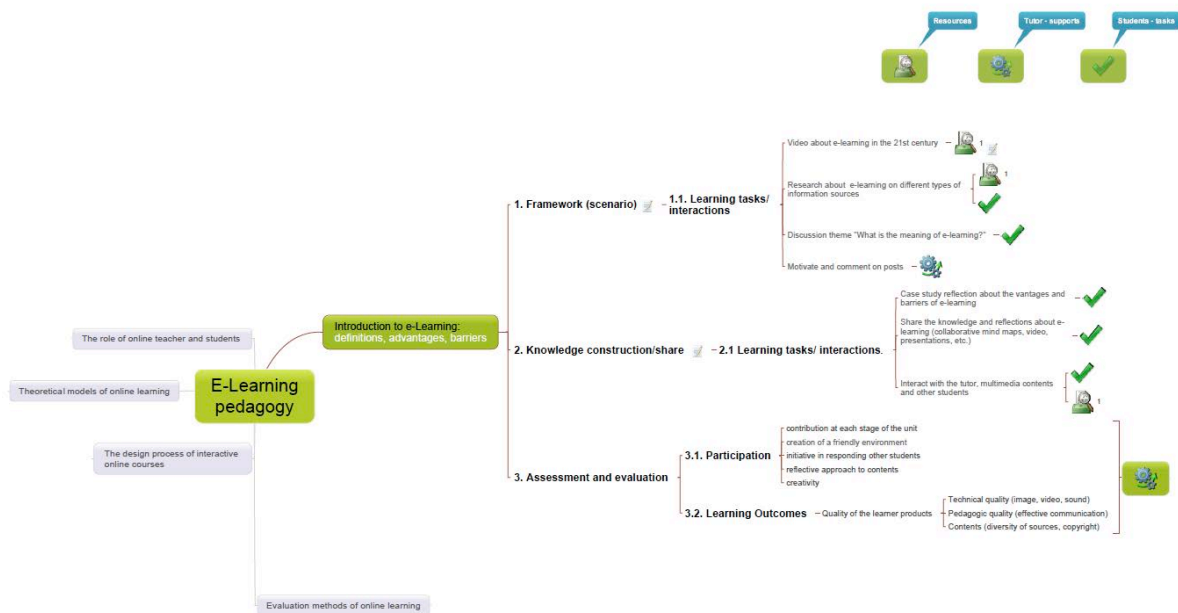

Image 1 – The course design.

E-learning Pedagogy is a course designed for Turkish adult e-learners. This course aim to promote and improve the value of e-Learning, increasing competences, developing skills that are not traditionally addressed by e-Learning. Some barriers to e-Learning are related to personal characteristics, culture and flexibility. So, it's necessary to improve skills and abilities to e-Learning.

- Learning Objectives: To acquire conceptual knowledge about how to design, to moderate and to evaluate e-learning activities in different pedagogical settings.
- Content: Introduction to e-Learning: definitions, advantages/disadvantages, barriers.
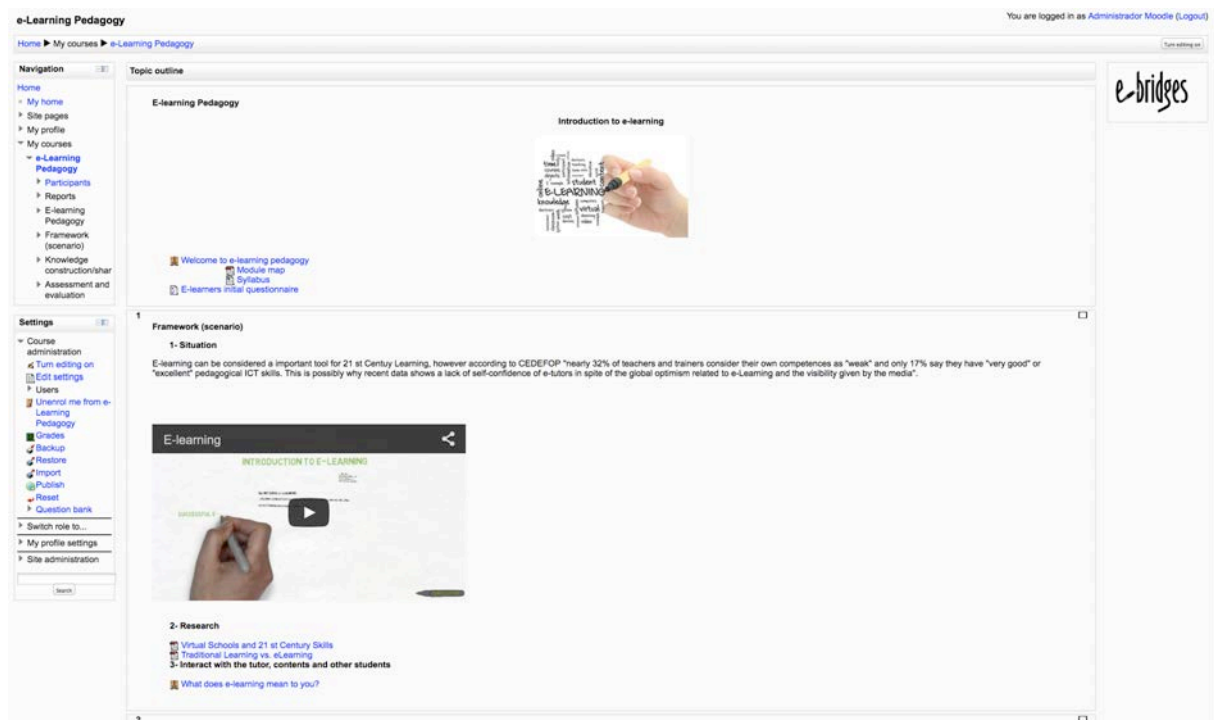
Image 2 – The course in the LMS Moodle.

In the end of this activity, and for evaluation purposes, a short questionnaire was developed for:

- the course designers to assess their views as to the value of the protocol for producing a course for students in another country, and

- the Turkish e-learners to assess their views of the extent to which they felt the course addressed their perceived barriers.

Although it is not possible to compare directly a course designed with and without the benefit of the 'e-Bridges Protocol' a short set of questions helped us to understand where, and to what extent, the protocol has had an effect.

a) Findings from the course designers answers

According to the course designers the protocol was useful for producing a course for e-learners in another country that were both unknown. They stated that they began by reviewing potential barriers/solutions and then designed the course to accommodate them. However, some of the identified barriers did not have a solution appropriate to the Turkish target.

They also pointed out that the '*Nature and objectives'* of the protocol and the '*Key principles'* were the most useful aspects of the protocol '*Introduction'*, and the description of each six stages was the features found most useful.

When asked if there are other features/issues that they feel should be included in the protocol, the course designers said: *"some features could be more specific (learner's issues, for example), in other cases more developed (content characteristics, for example). The protocol could provide a definition of e-Learning, different types and characteristics, and a small framework for understanding the relevance of some issues".* Also referred: "*Maybe some country's good e-Learning practice could be useful to help finding and share possible solutions for the issues and barriers presented".*

The fact that the Turkish students did not know the LMS Moodle conditioned the activities, especially because the platform is in English. Although knowing that in Turkey the majority of e-Learning promoters use www.myenocta.com, we had the information that the eleven Turkish e-learners had never used any platform, therefore we decided to choose LMS Moodle. The barriers mentioned the kind of LMS most used in Turkey but it was not emphasised that it should be in Turkish.

The Turkish tutor, despite his teaching privileges, failed to inscribe the learners into the Moodle because he wasn't familiar with the platform. Thus, the tutor validated the course options with the

eleven learners. He verified on the spot and had feedback that the learners would be able to perform these tasks. The learners validated the fact that the course was in English (which was a potential barrier). Nevertheless, the 'e-Bridges Protocol' questionnaire could have some question about the course's language: *Which languages are you able to use on attending a course in e-Learning? English? Other: Which language?*

Finally, the course designers referred that when compared with past work the 'e-Bridges Protocol' had a great influence in the way the course design was processed.

> *b) Findings from the Turkish e-learners answers*

The Turkish e-learners responses enabled us to conclude that the course was appropriate and took into consideration the students' concerns. Nevertheless, some answers pointed out two main issues: First, hardcopies of the pedagogical material ahead of the training are needed, because they find reading on screen very difficult. Prove of that is the state: "*There are no hardcopies of the books related with the course. In spite of the fact that it is a computer-based education, I need to have books in order to understand better the aim of encouragement. It would be useful if the books or hardcopy of the texts were delivered*" (Student2) or even "*Hardcopies of the texts! I feel very much in difficulty to study the courses on the screen*" (Student8).

One e-learner also found very difficult to overcome the language barrier, as the course was delivered in English. He pointed out: "*I can't take notes while taking course – language problem*" (Student6).

Another e-learner highlighted both aspects, what reinforces these concerns: "*Hard copies of the texts! It is difficult to study on the screen. If I had them, I feel myself comfortable. The e-trainees use the screen as whiteboard but I can't take notes because of my language problems at the same time*" (Student9)

The information that was generated from this phase provided useful insight into the issues faced by course designers, receivers and learners when promoting e-Learning activities both within and between partner countries.

4   CONCLUSION

The e-Bridges project developed a set of guidelines to design e-Learning courses. These guidelines, called the 'e-Bridges Protocol', provide e-Learning course designers with the kind of issues that may interfere with a successful course being designed for use across cultures and borders. It also suggests some of the country specific issues that may arise when developing a course for people in another country.

With this 'e-Bridges Protocol' it was possible to prepare a small-scale 'at distance' learning activity among partners. The first tests were conducted with Portugal targeting eleven adult e-learners in Turkey. The tests identified three main difficulties: (i) technical prerequisites (the Turkish e-learners do not have fundamental knowledge about the LMS Moodle, which turned it difficult for them to enrol with the course and had to rely on the local tutor support (ii) language (the Turkish e-learners do not read in English, and the local tutor had to mediate the course assessment); (iii) courseware (the Turkish e-learners were expecting full delivery of hardcopies of the pedagogical material ahead of the training).

An important conclusion is that the first questionnaire of students' characteristics has to be part of the protocol itself. Also, this questionnaire has to be more accurate in order to give the designer a better knowledge of the students' skills. Although the course was well designed and the 'e-Bridges Protocol' was essential in key points to be taken into consideration, the analysis phase did not alert us to these two vital potential barriers: the language and the lack of physical courseware content. In fact, no activity works in full if the characteristics of the students are not properly listed.

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REFERENCES

[1]   Lencastre, J. A. & Coutinho, C. (2014). Blended Learning. In Mehdi Khosrow-Pour (org.) *Encyclopedia of Information Science and Technology, Third Edition, Volume II* (pp. 1360-1368). Hershey PA: IGI Global. DOI: 10.4018/978-1-4666-5888-2.ch129 http://www.igi-global.com/chapter/blended-learning/112536

[2]   Sun, P., Tsai, R., Finger, G., Chen, Y., & Yeh, D. (2008). What drives a successful e-Learning? An empirical investigation of the critical factors influencing learner satisfaction. *Computers & Education*, Volume 50, Issue 4, May 2008, pp. 1183–1202.

[3]   Arbaugh, J., & Duray, R. (2002). Technological and structural characteristics, student learning and satisfaction with web-based courses – An exploratory study of two on-line MBA programs. *Management Learning*, 33 (3), pp. 331–347.

[4]   Wu, J., Tsai, R., Chen, C., & Wu, Y. (2006). An integrative model to predict the continuance use of electronic learning systems: hints for teaching. *International Journal on E-Learning*, 5 (2), pp. 287–302.

[5]   European Centre for the Development of Vocational Training [CEDEFOP]. (2012). *2011 Annual report*. Luxembourg: Publications Office of the European Union.

[6]   Lencastre, J. A., & Bronze, J. (2014). Building (e-)Learning Bridges: uma visão europeia das barreiras ao e-Learning. In Paula Peres, Pedro Pimenta, & Anabela Mesquita (ed.), *Guia Prático do e-Learning nas Organizações*. Porto: Vida Económica. (in press)

[7]   Lencastre, J. A. (2012). Development research. In A. Monteiro, J. A. Moreira & A. C. Almeida (org.), *Educação Online: Pedagogia e aprendizagem em plataformas digitais* (pp. 45-54). Santo Tirso: DeFacto Editores.

[8]   Schuler, D., & Namioka, A. (eds.) (1993). *Praticipatory Design: Principles and Practices*. New Jersey: Lawrence Erlbaum.

[9]   Steen, M., Kuijt-Evers, L., & Klok, J. (2007). Early user involvement in research and design projects – A review of methods and practices. In 23rd *EGOS Colloquium (European Group for Organizational Studies)* July 5–7, 2007, Vienna.

[10]   Bardin, L. (2011). *Content Analysis*. Lisboa: Edições 70.

[11]   Official Journal of the European Union C 70/1. (2011). *Council conclusions on the role of education and training in the implementation of the 'Europe 2020' strategy*. http://eur-lex.europa.eu/

[12]   Herrington, J., Reeves, T., & Oliver, R. (2010). *A guide to authentic e-learning*. New York: Routledge.

[13]   Thurmond, V., Wambach, K., Connors, H., & Frey, B. (2002). Evaluation of Student Satisfaction: Determining the Impact of a Web-Based Environment by Controlling for Student Characteristics. *The American journal of distance education*, 16(3), pp.169–189.

[14]   Wang, Y. (2003). Assessment of learner satisfaction with asynchronous electronic learning systems. *Information & Management*, 41 (2003), pp. 75–86.