AN APPROACH TO INTERACTIVE E-LEARNING: THE COMMUNICATION SYSTEMS IN MEDICINE COURSE

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Abstract

This article presents a project that tried to evaluate if e-learning is interesting for the students and can therefore provide a higher motivation and satisfaction than the traditional modes of teaching.

The study also tried to assess what would be the reaction of teachers when they are confronted with the need to use new educational technologies.

As an initial evaluation of the project, a sample of students and teachers assessed the e-learning contents, course and platform. Most of the students were pleased with the contents and considered the course very rewarding. All the students considered the system user-friendly and said that e-learning exercises are better than the traditional way of teaching.

1. INTRODUCTION

Can the use of e-learning make Technical Higher Education more attractive, more useful and more motivating for students? An answer to those questions was sought through the development of a collaborative project between the Technical University of Sofia and the Engineering Faculty of the Porto Polytechnic, in Portugal. The main research question of this project tried to evaluate if e-learning is interesting for the students and if it can generate a higher motivation than the traditional mode of teaching. But we were also interested in knowing what would be the reaction of the teachers when they use the new technologies applied to education. Could they use the system easily? Would they find e-learning systems user-friendly?

As an initial evaluation of the project, a sample of students and teachers assessed the e-learning contents, the course and the e-learning platform. 60% of the students were pleased with the contents and considered the course very interesting. All the students considered the system user-friendly and they said that e-learning exercises were better than the traditional way of teaching.

On the other side, teachers said that the system was easy to work with and they were pleased to be part of the process of integrating current and future technologies in learning.

2. COURSE CONCEPT

E-learning is characterized by a separation of space / time between teachers and students (but not excluding eventual physical meetings – blended learning) with a pattern of two-way asynchronous or synchronous communication. Normally Internet is used as the means for communication and sharing of knowledge, through the services and tools that this technology provides. The student becomes the centre of an independent and flexible training process, managing his/her own learning, usually with outside tutoring but managing schedules in a completely autonomous way.

E-learning is one of the more frequently used options for continuing education. The generation of professional development programs is growing because there is a strong need that workers are trained and become able to adapt themselves to new production requirements. E-learning, given its characteristics and technological support provides an alternative for those who need to combine work, personal and social schedules and training, as it does not require a permanent presence in a classroom.

Virtual education, another way of designating e-learning, provides an opportunity for the student to choose their hours of study making it a good choice for those who work and want independent study in their spare time. Therefore the use of e-learning for

academic purposes is also being looked upon as an important tool on its own or as a complementary activity to f2f classes.

Especially, and it is important to mention, because e-learning is an excellent tool that can help users learn new concepts but also consolidate knowledge and skills, thereby increasing the autonomy and motivation of students for different subjects.

In [1] Bruffee presented a set of requirements that should exist in exemplary cases of student centred learning environments:

- Students should participate actively in the learning process
- Students are responsible for the acquisition of their knowledge
- The teacher is a moderator and a facilitator rather than a knowledge transmitter
- The environment allows peer interaction and its evaluation

The success of this methodological approach depends on three main factors:

1. The network (Internet and/or Intranet) must be fully functional, allowing instant update, store, retrieval and sharing of instructions, communication and information.

2. The materials are delivered to end users through the use of computers with standard Internet technology.

3. The methodology focuses on a broader vision of learning that goes beyond the traditional paradigms of training.

The advantages offered by online training are:

- Elimination of spatial and temporal barriers (studying from home, work, on a trip through mobile devices, etc.);
- Allows the practice and use of simulation in virtual environments. This would be difficult to get in classroom training, without a big investment.
- Promotes real knowledge management through exchange of ideas, opinions, practices, experiences. Enrichment becomes a collective learning process without boundaries.
- Allows a constant updating of content
- Generates cost reduction (in most cases, methodological and, always, in logistics)

An important aspect of the use of e-learning environments relate to the possibility of practical immersion in a Web 2.0 environment, creating collaboration and social opportunities. This methodological approach promotes the communication of ideas, materials, and information, and the interactive creation of documents for learning purposes. This collaborative model of learning is characterized by multiparticipant communication, space and time independent communication, and computer-mediated communication. In [2], Harasim proposes that this is "the process of construction of knowledge by the integration of the student, the teachers, and the specialists in discussions and interactive activities." Several related theories further define this educational phenomenon and scaffold strategies to explore it [3], such as Vygotsky's sociocultural theory, problem-/project-based learning, cognitive flexibility, situated learning, and metacognition.

Computer mediation provides functionalities expressed in the previous points, but it also allows other mechanisms for the educative interactions. It allows revising, archiving, and recovering past interactions. This electronic log with the transcript of past interactions allows a detailed retrospective and critical analysis of the interaction [4]. It also allows collecting further evaluative data either to assess students or even to measure the quality of the course and to extract recommendations for improvement.

3. METHODOLOGY AND IMPLEMENTATION

The project progressed through the following stages:

- Research and comparison of e-learning systems and platforms
- Research and comparison of popular authoring tools for e-learning contents
- Design of an e-learning methodology that enhances interaction, motivation and user-friendliness
- Develop online contents, including exercises for a case study course: Telecommunication systems in medicine
- Test the contents

The pedagogical design assumed that a new educational paradigm was required, focused on the student; adjusted to its characteristics, constraints, and requirements [5]. E-learning platforms together with pedagogical and organizational strategies can support this new way of learning—more personalized, just-in-time, more fitted to individual needs, and more flexible in content and schedules.

A learning management system (LMS) is a software application for the administration, documentation, tracking, and reporting of training programs, classroom and online events, e-learning programs, and training content. Moodle is an LMS that has become very popular among educators around the world as a tool for creating online dynamic web sites for their students. Moodle is designed to support a style of learning called Social Constructionism. This style of learning is interactive. The social constructionist philosophy believes that people learn best when they interact with the learning material, construct new material for others, and interact with other students about the material. The difference between a traditional class and the social constructionist philosophy is the difference between a lecture and a discussion. Therefore Moodle was chosen as the platform for the project as it adjusted very well to the learning philosophy and strategy.

Concerning the course methodology and implementation one of the major ideas was to reuse already existing contents. Therefore all the theoretical material was taken from the book Medical Information Systems, Handbook for Laboratory Exercises and Selftesting, Technical University of Sofia, Bulgaria, 2009 written by Prof. Dimiter Tz. Dimitrov. The text in the e-learning exercises was selected in order to address the most import aspects about the subject.

The first step of creating the exercises was designing a template for them. The template is very important for a consistent and coherent view of the whole work. It must be user friendly, pleasant, with the right colours, the best organization of elements, an easy to understand navigation system, etc.

In this particular situation, the chosen colours for development were blue and white.

Blue: The colour of the sky and the ocean, blue is one of the most popular colours. Creates peaceful and tranquil environments and people are more productive in blue rooms. It can be strong or light and friendly. The blue colour doesn't tire the eyes and it easy for the people to perceive.

White: White is associated with light, goodness, innocence, purity, and virginity. It is considered to be the colour of perfection. White means safety, purity, and cleanliness. White usually has a positive connotation, at least in the Western Society. White can represent a successful beginning. In advertising, white is associated with coolness and cleanliness because it's the colour of snow.

Another important aspect is typography. The chosen font was Arial. It is simple and doesn't draw away attention from the information in the slides.

The theme of the exercises is related to telecommunication systems in medicine. Therefore the template used a background picture that looks like DNA (Deoxyribonucleic acid). The picture was placed in a way that it does not conflict with the text.

The development was accomplished through the collaboration between the universities of ISEP in Porto, Portugal and TU, Sofia, Bulgaria. Because of this the logos of the two universities are on the template, too.

4. RESULTS AND CONCLUSIONS

As an initial evaluation of the project, a sample of students and teachers assessed the e-learning contents, course and platform. A few research questions were placed and answered.

Are the exercises interesting enough for the students? 60% of the students answered that it is enough and 40% answered that there can be some more flash animations and movies to make the contents more interesting.

Is the system user friendly? 100% of the interviewed students answered "Yes".

Is the motivation and interest of students higher than in the traditional modes of teaching? All the students said that e-learning exercises are better than traditional way of teaching. For them is more interesting and easier to use e-learning exercises. And some of them mention about the advantage of the online lessons that if they miss one it is easy to understand what the colleagues did during the lesson.

What is the reaction of teachers when they meet the new technologies applied to education? and Can the teacher use the system easily? The answers show that teachers think that the system looks easy for work and they were pleased to be part of the future technologies. Some of them mentioned that for them it is easier when it is not necessary to repeat the same thing in several lessons.

In conclusion, we created an e-learning methodology, implemented through an e-learning platform

using interactive exercises, for the course "Telecommunication systems in medicine".

The online exercises are the beginning of the project in Technical University Sofia. In a few years all the Telecommunications courses in Medicine will be accessible through the Internet.

In that moment more animated and interactive contents must be produced to make it more interesting for the students.

References

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The authors wish to thank the European Commission for the grant in the Lifelong Learning Programme, the Executive Agency for its help and all the partners of the project for their contribution.

Project Number: 142814-LLP-1-2008-FR-ERASMUS-ENW
Instrument type: ERASMUS NETWORK