

IMMERSIVE AND INTERACTIVE e-LEARNING IN UNIVERSITIES ABSTRACT

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ABSTRACT

Educational systems in universities have changed very fast, e-learning is the most important change to improve the whole system in the last years and there are many specific technologies to be included in new solutions,

In this paper, we propose how to select and integrate these technologies in a specific solution, combining Technology and Knowledge Management.

The first task is to study and develop several TIC's applications to improve the learning process. After that the main effort is to review the university infrastructure and its knowledge system.

Besides , it is important design and organize an educational system applying proper pedagogical principles, using many available contents of knowledge and combining all them in classrooms with many tools to create a dynamic interaction, immersive visualization , collaborative work and permanent evaluation .

Knowledge Managements help teachers achieve this objective of knowledge development. In universities, it is a combination of experience, values, specialized information and expert insight for creating and improving individual competencies. The purpose of this paper is to analyze the educational system in universities in order to define and use proper tools for integrating a new modernized system of e- Learning. If the available resources are low, the system is simple but if the technological resources are high we would have an immersive and interactive system.

Keywords: Knowledge Management, Technology Management in universities.

INTRODUCTION

INFLUENCE OF TIC'S IN EDUCATION

Many efforts have been made to support the education system by means of TIC's. Technologies of Information and Telecommunications). The most popular applications are educational TV, radio and personal computers (Rajasinghem 1997).

In spite of that, traditional classrooms remain being the most used in schools all over the world, but mainly in developing countries . It is not clear which technology is going to

substitute the present ones. It seems that a wide combination of technologies will be used in future to improve educational systems.

For example, in the nineties, technologies showed that telecommunications were the main issue in which new experimentation was based on. There was no a dominant technology in the classroom.

According to Cabrero 1998, to a specific society model corresponds an educational model. In those models there are several information and automation systems which are present also in homes, enterprises and schools. That is why, Castro 1995 and many other authors affirm that new technologies are the same in several environments, so communication technologies, multimedia, computer technologies are the key to change education and learning.

According to experience, applications of TICS in education, require a wide collection of technologies that offers deep changes to improve learning.

KNOWLEDGE MANAGEMENT APPLIED TO IMPROVE LEARNING

As a framework to improve learning, Knowledge Management is a new approach. The process for improving learning requires three stages: Knowledge acquisition, Knowledge sharing and Knowledge utilization :

Knowledge Acquisition

This stage includes IT components surrounding the system focused on the objectives. Data captured tools with filtering abilities, intelligent databases and electronic whiteboards are the main examples of IT technologies.

Knowledge Sharing

Disseminating and making available information already known are functions for having knowledge that is being shared.

Knowledge Utilization

It is the last stage in which learning is integrated and applied to the organization, in this case the university.

The conclusion is that the three stages, acquisition, sharing and utilization of knowledge are supported by specific tools, which can be used on each.

LEARNING ACTIVITY IN UNIVERSITIES

Universities require many different kinds of learning. Modern Technology allows teachers to create course resources whereby students can interact different course contents vía WEB. For example, online experiments, online trips, online training in

operational routines, online calculations for designing equipment, online training in new competencies, team collaboration and training for teachers through multimedia, videos or audio clips to improve their knowledge.

LEARNING MANAGEMENT SYSTEM LMS

In the last decade three factors drove the progress of educational systems: proliferation of personal computers, widespread of internet connections and improvements of software tools for creating e-learning resources.

e-learning has had a significant progress thanks to these elements. In fact, an LMS is simply software that allows an instructor to create and organize resources, present interesting discussions and apply online tests.

LMS is used also in corporate training environments or in academic areas to achieve competency development.

Using an LMS it is easy to create a course site for instructors who want to access the internet with their students.

KEY ACTIVITIES TO BUILD A KNOWLEDGE MANAGEMENT SYSTEM

A KM system is very useful for a university because it contributes to its competitiveness and helps to identify opportunities for exploiting each kind of knowledge. In order to build a KM system in a university we can follow six steps:

- Analyze information assets to organize them in accordance to universities functions and careers
- Identify knowledge critical to a university
- Integrate a Knowledge structure
- Align university strategies to Knowledge Management
- Analyze existing Knowledge
- Design, develop and build a KM system taking advantage of existing IT investments and implementing leadership needed.

LEVELS OF KNOWLEDGE

In opinion of experts, there are four levels of knowledge:

Know what, Know how, know why and Care-why. The first one represents cognitive knowledge. The second, the ability to translate knowledge from books.

PLANNING A COURSESITE DESIGN

A course site architecture describes the organization of e- learning resources in a course site . Of course the classrooms are digitized; besides several places are required for functions as electronic discussions, chats and collaborative work.

ELECTRONIC DISCUSSIONS IN UNIVERSITIES

Electronic discussions are one of the most important tools of e-learning because they offer interesting solutions for achieving critical thinking, active learning and interactive sessions.

On the other way, discussions improve teacher's and student's skills to interact in groups. Different kinds of discussions are forums and chats on a specified topic of general interest once this topic is created , the LMS button is selected to initiate a topic entry When a person wants to contribute to a discussion forum they only click on the forum topic itself to activate the text box in which a response may be typed in this way.

An electronic discussion is a two-way communication among students and teachers, sending and receiving messages. It is a powerful kind of e- learning to promote critical thinking, active learning and practical discussion. On- line discussions are easy to implement. At the beginning several relevant ideas are stated and some advantages and disadvantages added.

Forums and chats are the main forms of electronic discussions.

Forums are asynchronous electronic discussion on a specific subject or specified topic. Forum threads are the online entries made by participants. Facilitators and moderators are persons who try to interact with students to observe appropriate discussion policies.

Chats are synchronous electronic discussions on a specific topic.

THE VIRTUAL REALITY CAMPUSES PROJECT IN EMERGING COUNTRIES

Emerging Countries have many problems in social, economic and educational aspects. So, they do not have a lot of economic resources to build modernized campuses in their universities. In spite of that, they have a great interest in using TIC's because in some applications they represent low cost options. The virtual reality campuses are in general expensive options. They only can be implemented in a long time range.

A MASTERPLAN FOR APPLYING TIC's IN A UNIVERSITY TO BUILD A KNOWLEDGE MANAGEMENT SYSTEM.

Information Technology has been widely used in the mathematics classroom since the end of the nineties . An interesting example was the case of five schools selected as a pilot plan in Singapur to introduce a new e.learning system.

A Masterplan for applying e- learning in a university should consider several components. This solution has some differences from business companies The typical Knowledge platform for a university has the following components

- The computer for sharing knowledge
- Databases of learning objects and multimedia
- INTERNET services
- WEB Conference for dialog
- INTRANET for connectivity
- Groupware Extranet for collaboration
- Digital classrooms
- Visual media technology
 - Visualization spaces
 - Virtual Reality spaces
 - VR Laboratories
 - Spaces for electronic discussion

Following, we propose a methodology to develop a Knowledge Management System in a university:

- Define education and knowledge policies
- Analyze and Redesign Infrastructure
- Analyze Knowledge existing assets
- Create and develop a Knowledge Management System
- Evaluate and Audit Performance of the system

Each university defines its educational policy in order to precise its general rules in terms of technology, values, economic aspects and costs.

Infrastructure analysis and redesign. The existing infrastructure is leveraged. It is necessary to build the new Knowledge Management System platform above the existing

one. IT tools integrate all components and besides allow communication, storing codified knowledge and interdependencies.

The new design provides several functions: to find knowledge in formal and informal sources and in other bases, to assemble knowledge using different technology tools and to facilitate the application of knowledge in practices, group discussions and classrooms providing also storage and organized tools for transferring knowledge.

One of the main activities in this process is to analyze the Knowledge existing assets. The goal is to evaluate if a university has enough knowledge or if it is tacit personal knowledge or exists in explicated form or if it is used and sharing in different ways.

It is essential to be able to evaluate also the knowledge growth over time, ensuring that the stock continues to increase and used the best.

Create and develop a KM System require first to define the new architecture supported by the old one. The new one has to support the part of tacit Knowledge that remain, as much as the part that should be made explicit. In a university each teacher has his or her own tacit knowledge, but it is hard to define how and what part should be became the explicit one, unless this work be made in a collaborative way.

CONCLUSIONS

Universities as enterprises have to build solutions for achieving the best knowledge development in their institutions. This purpose requires the use of many technologies and tools for Knowledge Management; Technology Management is used for selecting these technologies. It is possible to choice between different levels of technologies. The highest level allows an immersive and interactive e-learning system.

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