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CONTEDI - Application Development for TVDi

Adriana X. Reyes G, Gustavo A. Moreno, Jovani Jimenez B.
Politecnico Colombiano Jaime Isaza Cadavid, Universidad Nacional de Colombia.
{axreyes,gamoreno}@elpoli.edu.co, jajimen1@unal.edu.co

ABSTRACT

This article presents partial results of the project CONTEDI, educational content to digital television (DTV), which is an initiative within the University to go deeper into the development of applications based educational platform TVD. We present the key issues, methodology and tool set for developing applications and the early test results of the application.

Keywords: Interactive digital television, TVD, education, t-learning, CONTEDI.

1. INTRODUCTION

The TV has long been a media easy to use and now has extensive coverage of digital terrestrial television (DTT). The application of this new technology offers many advantages and possibilities of the standard signal, for example, better image quality (high definition) and a higher quality sound as well as the possibility of developing new services and applications (t-commerce , t-government, health t-, t-games, t-t-employment and education, among others) in convergence for the user.

Digital television is becoming important in teaching and learning processes, scope is known as T-learning (Bellotti, 2008). That is, interactive and personalized learning through the TV, with a new approach to virtual education, complementary to the PC-based, where they have since informal courses to university degrees. In addition, digital TV offers another alternative for people who have no or giving them your computer hard drive, TV remains the most friendly and found in most households, thus contributing to digital inclusion.
This article presents the partial results of research CONTEDI T-learning, linking education with the use of interactive digital television. The paper is divided as in the first part sets out the preliminary work on this topic analyzed in the third unit is proposed structuring phases of the project, on the other drive aspects to consider how technology and standard TVD in Colombia, the architecture of t-learning, and other recommendations, last initial testing of the prototype implementation for the project CONTEDI

2. APPROACH AND JUSTIFICATION

For over a decade the rapid growth of ICT and its use in education has generated a lot of changes in traditional educational structures as well as the interest in defining new models for the design of advanced learning (Garcia Gutierrez, 2005). Digital television is one such alternative development and the future promising research for teaching and learning. Digital television penetration by high TV, interactivity, ease of use, among others, is a component of exploration that contributes solutions to the demand of the information society for education, which refer to: increased access to education for all, continuous learning throughout life, formal education, flexibility, availability of connections and interactions and particularly for promoting regional access to higher education in disadvantaged areas.

This proposal seeks to move into teaching and learning processes based on digital TV, enabling the school to prepare, to project and develop applications for deployment.

3. GENERAL CONCEPTS

3.1 T-Learning

DTV provides a great opportunity to education. This comes as news to viewers and is the convergence of the education sector, telecommunications, and Internet in the same medium. This technology will allow the development of interactive educational platforms resulting in what is known as T-learning. The term T-learning is used to mean learning through interactive television (Pavlov, R. and Paneva, D. 2006). T-learning, is described as the convergence between iTV and the e-learning. The latter understood as the use of information technology to support educational and training activities. Other definitions of t-learning are: learning via interactive television or interactive access to rich educational content primarily in the home video through a TV (Bates, 2003). It is a subset of e-learning, the latter referring to any form of learning through a digital electronic device connected. It is the convergence of technologies TVDi and e-learning (Damasio, and Quico, 2004). It is the convergence of television and computer technologies (and more specifically Internet) (Lytras et al, 2008).

T-learning incluye otras tecnologías como tecnologías móviles y protocolos de internet (Internet Protocol, IP). Sin embargo la televisión o un dispositivo configurable para ver contenido de difusión es el principal medio en T-learning y los otros dispositivos son implementados como medio secundarios para soportar el aprendizaje.

3.2 Previous Work

Some educational proposals in digital television have the following background: t-teacher (Days Redondo, 2008), and t-learning authoring tool (ELU, 2007), Motive (Aarreniami, 2006a), CBeebies (BBC Online) , VEMiTV (Damasio and Quico, 2004), (O. Pinto et al, 2008), EDiTV (Editv, 2008) (TV Escola, 2003). CONTEDI aims to deepen the scope of education in TVD.

3. METHODOLOGY

Diagnosis. This phase will illustrate the advantages of digital TV, setting the current situation and the desired state (SWOT matrix), existing technologies and standards, draft proposal.
Planning. Establish an interdisciplinary group, based on the architecture, and commercial proposals are proposed equipment, software and budget.
Design on measure: defined objective, target audience, requirements (interdisciplinary support group, technical, personal, and educational), and define alternative solutions if they are required for the system of information, communication, and storage.
Defining roles and activities schedule. Draft application.
Implementing test "pilot". Is the development phase of the beta, which takes time to design and coding, as advised for TV deployment, and integration with other elements such as initial operating tests.
Evaluation test "pilot". After developing the application, testing will be submitted to a group of students, to verify its operation and the results of its use. It is recommended that a checklist. This assessment draws conclusions and any necessary adjustments are made.

4. RESULTS

EDUCATION USING DIGITAL TV

One factor in favor of education through digital television, is that most users have a TV, and tend to trust what they see there. The TVDi also allows distance learning as an additional educational option to e-learning and computer-based educational programs for analog TV. Also some people do not have computers or do not use, others are difficult to manage the computer, or do not have internet access. Hence the challenge to define more interactivity and personalization to projects based educational television. (Zajc, M. 2009)

Among the types of interactivity in Digital TV is according to the degree of user participation and interactivity collaborative Hardware which can create social community which is part of social software, as shown in Table 4. All these aspects and advantages of digital TV is what can make the most in academia.

TYPES OF INTERACTION
BY THE CONVERGENCE OF SERVICES

Systems of low interactivity	Since receiving information to interact with text messages (phone line). Poor interaction.
Half Interactivity systems	Mejoras en las limitaciones de acceso. Desde un teclado, hasta sistemas de reconocimiento de voz.
High interactivity Systems	Improved access limitations. From a keypad, to voice recognition systems.
AS PART OF THE SYSTEM USED TV	
local interactivity	Between the user and the content of the STB. Simple interactivity.
global interactivity	Between the user and the broadcaster or service provider. Full interactivity.
DEGREE OF PARTICIPATION BY USER AND HW	
Weak interactivity	Using just the remote control
Hybrid interactivity	Composed of PDA, web cams and language interfaces..
collaborative interactivity	Create social community.
strong interactivity	Using multiple channels of communication between devices or between consumers.

Table 2. Types of Interactivity

All this confirms that the T-learning allows a complementary option to e-learning education. In particular, education-based interactive television promises a high potential due to its ability to support interactivity. Within the project CONTEDI, T-learning is used as a proposal of the teaching / learning based on TVDi. It explores the context of the TVD, to know the technical, educational, communication and content production. To develop the project were purchased devices such as encoder, modulator, DTA-105 DVB card, computer, TV + STB, multiplexer, and the iTV software suite of educational Icareus (ICAREUS, 2010), for experimental tests in the laboratory. It is based on studies of t-learning models and recommendations for content development and was defined as a prototype and laboratory testing of a course module (computer issue, specifically on input devices, storage, and end!) figure 1 illustrates the interface of the software suite to develop iTV interactive applications.

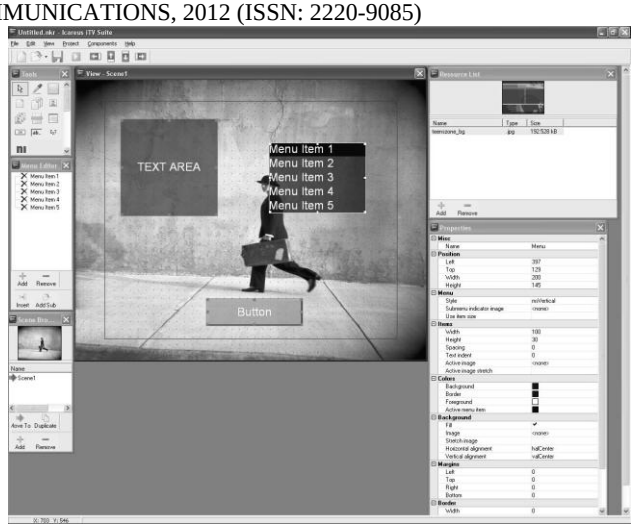

Figura 1, interfaz del software iTV suite

T-LEARNING CASE CONTEDI PROJECT

With the research project CONTEDI (Educational content for digital television), working in t-learning, as proposed teaching / learning based on TVDi. It explores the context of the TVD, to know the technical, educational, communication and content production. In addition the following:

• The context is under the DVB standard, chosen by Colombia on August 28, 2008 and as agreed in December 2010.

• Initially based in a research setting and use (exploration).

• Establishment of a small interdisciplinary group (professionals in IT, telecommunications and audiovisual communications).

• Some devices are acquired as an encoder, modulator, DTA-105 DVB card, computer, TV + STB, multiplexer, and the iTV software suite Icareus educational laboratory for experimental tests.

• It is based on studies of t-learning models and recommendations for content development made (Aarreniemi, 2006) (Moreno, 2010), (Hansen, 2005), (Arvid, 2009), (Inteco, 2009) (FSPUGT, 2008), (Karyn, 2005), and (Collazos, 2008).

• Defined as a prototype and laboratory testing of a course module (computer issue, specifically on input devices, storage, and output).

Figure 2 illustrates the first experiences with the iTV software suite to develop interactive applications.

Figure 2. Experience with the iTV suite software for CONTEDI

A survey was conducted to determine the perception of the actors involved in a small sample (30 people).

On the survey, following are some of the results:
90% of respondents within the application if it provides information on activities and topics to be developed in the course.
Overall, the average of the responses with 85% mentioned that the application if graphically presents the specific items on the subject.
50% responded that the reference is not clear institutional application. This is important in so far as being in a formal educational framework, the application must show your corporate identity.
As to the content if appropriate, with 89% positive responses.
On use of the software errors, with 89% that are not errors, but with respect to the use of mechanisms of learning assessment suggests that 78% no.
On the use and application control, with the result that on average 89% gives a positive use and application control.
With regard to the presentation of information in a fun, 67% raises so.

One proposal is for a second phase of this project is to evaluate the application in a normal course, with a pilot group and a control and its application for use in the programs offered at a distance.

CONCLUSIONS

Technologies, such as DTV, is a more, where it is important to get the most benefit and to develop and deliver content, this in turn allows collaborative interactivity.

The universities or educational institutions have an opportunity to propose and develop applications and content for interactive digital television. CONTEDI research project, still in the prototype phase of debugging and testing.

CONTEDI research project is a proposal as a platform to explore and develop educational applications from any area of knowledge in the environment TVDi. As for the application developed to be improved in the areas of interface, teaching and interactivity options and wait for the near future to implement and evaluate actual implementation with students from a normal course, and its application for remote use, and investigate more in customization, the return channel options and convergence with the internet. Also in each project must feed the technical, pedagogical, educational, language television, and content development.

The project continues in debugging phase of the implementation of the prototype and testing, and is expected to near future to implement and evaluate its actual application with students of a normal course. Likewise, the project continues to move in the pedagogical, educational, language television and content development. TVD system and application development and content must involve many aspects to consider.

The Colombian government with the election of the DVB standard for the dissemination of digital television signals, has opened the doors for mass deployment and in the coming years. This indicates that all efforts should be made to its ownership and content development. The University has an opportunity to propose educational applications for digital television, and the project CONTEDI becomes a participant in this effort.

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