T-Learning for social inclusion: main evidences from BEACON

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Background

BEACON (Brazilian European Consortium for DTT Services) is a three year innovative research project (2007-2010), supported by the European Commission, on Digital Terrestrial Television, in Europe and Brazil, with three core objectives: the development of interoperability between the European (DVB) and the Brazilian (SBTVD) Digital Terrestrial Television standards, the study of a methodology for distance learning through digital television and the delivery of t-learning services related to social inclusion in Sao Paulo, Brazil. BEACON aims to go ahead in the state of the art of the Digital Terrestrial Television (DTT). In view of the objective to realise innovative t-learning pilot services related to social inclusion in the State of Sao Paulo (Brazil), BEACON will face the interoperability issue on Interactive TV Platforms. On the basis of state-of-the-art technologies in both Europe (DVB-MHP framework) and Brazil (SBTVD-T platform) interoperability through an adaptable abstraction layer will be created.

BEACON intends to achieve the ambitious goal of providing methodologies, process schemas and pilot applications that will run on different Interactive TV platform worldwide (Brazil, Europe, North America, Japan). On the training and learning processes and systems side, the project is aimed to promote pedagogical innovation in training, notably though the use of ICT, by focusing on: designing and implementing tools to support individuals undertaking self-directed learning; strengthening distance learning and language learning through developing new delivery methods. The technological and pedagogical research issues are followed by in-depth testing (through pilot runs in Sao Paulo). The use of a User-Centred Design (UCD) evaluation methodology during this pilot phase will enable the definition of a sustainable model for t-learning development.

Digital Terrestrial Television for Social Inclusion

Since the DTT wide range of potentials of usages and diffusion, the Brazilian government's fundamental objectives was to promote its development in order to diminish the discomforting conditions caused by the social exclusion.

Moreover, the number of households with a TV set, are more wide spread than PC; hence, the use of TV as a means for content distribution is rather relevant with reference to this specific context. The two targets identified in the Beacon project are to support teachers of people with special needs (i.e. for people with disability) and to prepare students accessing the university system.

In order to access a public University, students need to succeed in the so-called "vestibulario" exam. The hardest subjects are Portuguese and Science. Experts involved in the research, pointed out that Brazilian students find most difficult the interpretation of written tasks. Therefore, most students need extra training to be able to get through the exam; A face-to-face Pre-vestibular

course, that prepares students for this "vestibular" exam, is however very expensive and thus constitutes a social exclusion factor;

DTT utilization for preparatory courses would therefore be of great value since most students own a TV, as opposed to internet which is often accessed only from outside the house. Finally, as television is a very well-known medium for the transmission of information, knowledge, etc… the expectation of the target group is to have a pre-determined learning track with a simple and linear methodology.

Design Considerations

Within BEACON's preliminary analysis, prototype development and pilot design highlight that t-learning courses and services for students should be developed according the following considerations:

- The use of an accessible language to young audience, interactivity and speed of contents;
- Contents organized in modules to meet the needs and level of preparation of students coming from different schools;
- The course should not be too flexible to allow the students to enter the learning activities as he/she pleases;
- To allow the pupil to access the contents already submitted whenever he/she wishes to;
- The school subjects for the experimentation should be selected and chosen among: Portuguese and Scientifics;
- It is advisable to present the content in a juvenile format, to make the subject of study more appealing;
- The emotional factors should not be disregarded (e.g. displaying a guide/coach during the learning activity);
- To have a support services for surfing the contents and a propedeutical utilization track;
- To utilize interactivity and to be included simulations/exercises, self- evaluation test.;

Contents should be planned according to the severe cognitive learning difficulties of the students which cropped up in the various analyses. Finally, tutor participation would be also much appreciated both for understanding the contents and for motivational aspects (the majority of students and experts do not feel at ease towards distance learning, being considered as a distracting and very directional tool).

The BEACON research group is now focusing on designing a tutoring model (and related competencies maps) that can be effectively implemented to support t-learning courses.

The following figures are an example of a friendly and simple prototype of user interface studied for the BEACON project.
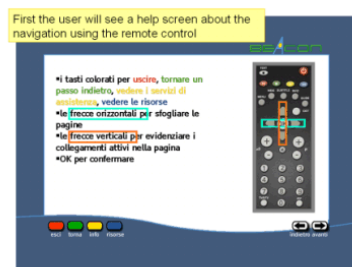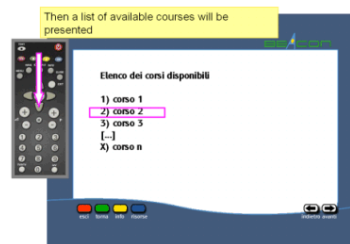

Figure 1. The access to courses

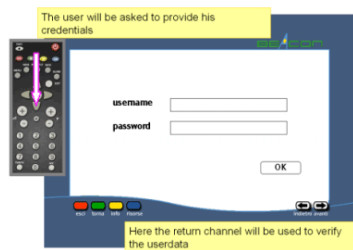Figure 2. index of the courses
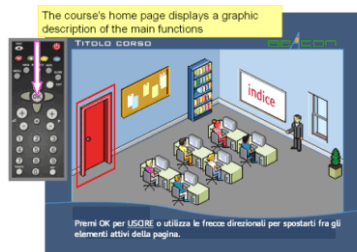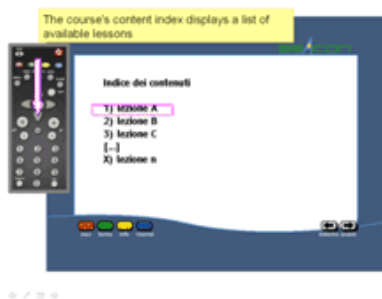
Figure 3. Log-in

Figure 4. Home page

Figure 5. Index of contents

Figure 6. Example of a page course

Figure 7. Example of an exercise.

Figure 8. Example of the interaction with tutor.

Evaluation and Testing

Lab testing of the technologies has already happened. In the next coming months, there will be a testing phase in a real-life setting with the final target groups. For this a user-centred design approach will be followed. The user-based assessment of the BEACON courses will be conducted from a usability perspective and an instructional design perspective. The usability testing will be conducted in two laboratory test sessions, followed by a post-questionnaire and an interview. The usability analysis will be done on the basis of five parameters: learnability, memorability, efficiency, efficacy, user satisfaction. The instructional design evaluation will be realized in one test session followed by a post-questionnaire and an interview. The instructional design evaluation will be done by using the criteria of course delivery, content, quality, presentation, assessment,

support and feedback mechanisms and general learner satisfaction. For each laboratory test session, a focus group of 10 users will use the prototype in a video lab setting. Each user will be invited to think aloud while they are testing the product (think aloud principle). After each session, the user will be briefly interviewed and requested to complete a short questionnaire.

Each evaluation activity will result in recommendations for the improvement or adjustment of the prototypes. Indirect target groups of the results of the evaluation are the State of Sao Paolo and other relevant policy-makers, the Education and Training sector, Educational Content Providers, the Telecom Industry in Brazil and Europe, potential business/exploitation partners and designers involved in usability and (t-)learning or e-learning, iTV or IDTV experts, the public opinion. This is particularly important for the exploitation of the services the project wants to create.

Conclusions and Recommendations

T-learning is regarded as: a better methodology with respect to e-learning being easier to use and considering that difficult access to computers is still a cause for social exclusion in Brazil; a widespread communication and training medium (TV sets are in all households and they are easier to use); an effective solution for fostering social inclusion (thanks to its accessibility and cost-effectiveness).

BEACON's project evidences as well as other EU funded projects (such as Samba) and regional tLearning projects confirm that the new digital broadcasting platforms will give a good contribution to enrich media diversity in many countries, as well as strengthening both current and future television broadcasters by providing independent infrastructure, which will also increase learning activities, governmental and cultural services for citizens. In this sense, this innovative technology can effectively contribute to creating a continuous learning environment for lifelong learning and employability, also related to social inclusion issues. Its application to tGovernment areas also can support more active citizenship (as showed in the ongoing Dida' regional project). In this context, the terrestrial transmission of broadcasting services will play a special and important role in the combination of various platforms and so to address effectively digital divide issues and social inclusion opportunities through a wider education system. Nevertheless the spreading of t-learning services will primarily depend on their effectiveness and reliability (that must at least be comparable with those of the e-learning) that in turn depend on:

- the development of consumer access devices (end user terminals and associated open middleware) that have to be affordable and easy to use;
- the suitability of the developed t-learning services - whereas suitability of the services relies on the understanding of the type of learning resources and the way people learn in the home;
- the availability of the technological solutions that enable and facilitate such developments.

At last, the role of an institutional body is surely essential in order to speed up the adoption path of a new technology with social aims. From direct incentives to buy needed equipments, to the set up of the legislative framework for the diffusion of the new technology, to the collaboration with other international partners, from industries or academies, in order to assure the maximum development of the technology itself. These and other actions must be attentively examined and evaluated during all the phases of the adoption process, from the institutions, in order to choose those ones which can create the best conditions for society and market development.

References

- ANDREALIS A.,BALDO D., BENELLI G., DAINO G.L (2007). Towards iTV applications' portability across Digital Terrestrial Television frameworks", September 2007, Dubrovnik-Split (presented to IEEE SoftCOM 2007 International Conference on Software, Telecommunications and Computer Networks)
- BIJNENS H., DE GRUYTER J.(2008). How learning through digital terrestrial television (DTT) can lead to an inclusive society: The BEACON t-learning pilots in the State of Sao Paolo (Brasil), DIVERSE 2008 - Developing Innovative Visual Educational Resources for Students Everywhere 1-3 July 2008, Haarlem, The Netherlands
- RECCHIONI M., CASTELLO V., SANCIN C., ROSCANI M., BIJNENS H. (2008). An innovative and inclusive training system by digital terrestrial television:evidences from beacon project (25 Aprile 2008) presented at EDEN Annual Conference 2008 (11-14 June 2008, Lisbon, Portugal).
- RECCHIONI M., CASTELLO V., DELL'AIUTO V., SANCIN C. (2008). Strumenti collaborativi, intermodalità e life long learning. dove vanno le innovazioni, (15 Giugno 2008) presented at Sie-L Conference (Società Italiana di e-Learning) - E-Learning Tra Formazione Istituzionale e Life-Long Learning 8-11 October 2008, Trento, Italy
- RECCHIONI M., CASTELLO V., SANCIN C., DELL'AIUTO V., DAINO G. (2008). T-Learning Systems Applications, Interoperability and iTv portability. Evidences from Beacon Project, 30 Maggio 2008 presented to 2008 NEM - Networked and Electronic Media- Summit "Towards Future Media Internet" 13-15 October 2008, Saint-Malo, France
- SANCIN C., MIANI S., BRAVETTI F., CASTELLO V. (2008). Applicazione in ambito internazionale del t-learning, 13 Giugno 2008 presented to Sie-L Conference (Società Italiana di e-Learning) - E-Learning Tra Formazione Istituzionale e Life-Long Learning 8-11 October 2008, Trento, Italy
- SANCIN C. (2008). T-Learning Systems Applications in a multi-channel digital environment. Evidences from European Projects, 11 Giugno 2008 networking session presented to ICT 2008 - 25-27 November 2008, Lyon, France.

All BEACON deliverables, papers and presentations can be found on http://www.beacon-dtt.com/en/index.php