

Crossmedia Personalized Learning Contexts

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ABSTRACT

The trends in convergence, integration and co-existence of various media technologies are creating new opportunities for the globalization of learning practices. The emerging era of lifelong learning is calling for flexible environments. Interactive television (iTV) holds a great potential in this scenario, but there is still limited research in terms of cognitive and interaction aspects. With the aim to link these opportunities, in flexible, adequate and effective learning contexts, a new paradigm to generate crossmedia personalized learning contexts from iTV, based on cognitive and affective aspects, is being studied. This paper presents the results obtained from the use of the e-iTV system, designed to illustrate and explore this paradigm.

Categories and Subject Descriptors

H.5.4 [Information Interfaces and Presentation]:
Hypertext/Hypermedia – *Architectures, Navigation, User Issues.*

General Terms

Human Factors, Design, Experimentation, Verification.

Keywords

Educational hypermedia, iTV, human-computer interaction, crossmedia learning environments, personalized web content.

1. INTRODUCTION

The convergence of various media technologies is creating new opportunities and challenges in terms of learning support. Simultaneously, the lifelong learning era, which is taking place in a wide variety of contexts and locations, calls for flexible environments in order to support personalized learning contexts. As to iTV technology, it is increasingly being developed and used [2]. Some studies have identified potential for its use in order to increase learning opportunities in the home through personalized options [1] and the need to find ways of using the powerful combination of broadcast TV and interactive services to provide hooks to draw viewers into active learning environments. However, there is still limited research in this area. Thus, based on the identified challenges and opportunities, the main goal of our research is to study a new paradigm to generate, from iTV and based on cognitive and affective aspects, crossmedia personalized learning contexts as educational hypermedia spaces. To illustrate, explore and help testing this paradigm, the e-iTV system was designed. The main research questions include: (a) are the

educational hypermedia spaces, designed and evaluated based on cognitive and affective aspects, capable to effectively contextualize viewers in relation to the TV program and give a learning sequence to it? (b) is there an advantage in connecting different media technologies for this purpose? (c) are the interfaces intuitive and effective? (d) what level of detail and intrusion in the interfaces, and especially in terms of TV viewing, is preferred for the user experience and support? (e) is the system, and the underlying paradigm, considered useful? (f) what other functionalities would the viewers appreciate and value in this context?

2. CONCEPTUAL FRAMEWORK

An effective design of a crossmedia learning environment requires the understanding of the cognitive, affective, interaction and communication aspects involved in the interaction with the different media, and the challenges that arise when several media and devices are integrated. Some of the main issues studied were *media and cognition aspects* - including Norman's [7] experiential and reflective cognitive modes, affective aspects in iTV [2], rhetorical and aesthetic aspects of hypermedia linking, especially when video is involved; and *crossmedia design* - considering that the most successful applications are likely to be those making the best match between technology and the function it supports, with flexibility in their combination [3,4,6].

3. e-iTV SYSTEM

The e-iTV system integrates the traditional iTV with web, across different devices, in order to accommodate the different cognitive modes involved in learning, while trying to have each media and device provide the cognitive support most suited for each situation and stage. While watching a TV program, where viewers tend to be in experiential cognitive mode, they will be able to select the specific issues in which they are interested in learning more about, and later explore in a more reflexive mode with the adequate support. A personalized learning content addressing the selected issues and related web links will be generated by the system, and made available to the viewers, via the Internet, in a format to be viewed on PC, iTV and mobile devices. A User-Centered Design approach was followed for the e-iTV system. The focus was on the population with more technological literacy typically found on younger populations [5]. However, considering the importance of lifelong learning, the system is also being designed and tested with people with lower technological literacy. To choose a specific TV program that could be highly appreciated, a questionnaire was answered by 243 persons. The preferred option (57%) was a documentary about space. The web