A Model for Personalized Learning Through IDTV

Marta Rey-López, Ana Fernández-Vilas, and Rebeca P. Díaz-Redondo

Department of Telematic Engineering, University of Vigo, 36310, Spain
{mrey, avilas, rebeca}@det.uvigo.es

Abstract. Interactive Digital TV (IDTV) opens new learning possibilities where new forms of education are needed. In this paper we explain a new conception of t-learning experiences where TV programs and learning contents are combined. In order for its creation to be possible we will use Adaptive Hypermedia techniques and Semantic Reasoning to design an Intelligent Tutoring System (ITS) whose tasks consist in selecting, combining and personalizing the contents to construct these learning experiences.

1 Introduction

The arrival of IDTV makes the access to distance education easier, since about 98% of European homes have at least one television set, whereas the penetration of Internet-enabled computers is lower than 60% [1]. Apart from wide-world usage, TV is considered by the viewer trustworthy in reference to broadcast content and easy to operate. These conditions are an ideal starting point for TV-based interactive learning, referred to as t-learning.

In fact, education has always been present on TV, embedded in documentaries or programs for children—e.g. *Sesame Street*. To designate this form of entertainment designed to be educational, in 1973, Robert Heyman coined the term edutainment. Today, some TV channels have developed t-learning contents in this direction. In the UK, we can find some examples of games and interactive stories for children, as well as documentaries with additional contents, e.g. *Walking with beasts* produced by the BBC [1]. In Portugal, TV Cabo has developed several edutainment applications, some of them adapted from existing web sites, like *Ciberdúvidas* —resolving doubts regarding the Portuguese language [2].

Apart from introducing education into TV programs, transferring traditional structured courses to IDTV is also possible, using this medium solely as a means of transmission for education: transmitting on TV the image of the teacher to the students and vice versa [3] or broadcasting on TV typical e-learning courses, based on text and images [4]. One step further, the scenario for t-learning developed by our research group [5] has improved on these, since learning resources are designed especially for TV and so are based on audio and video content.

However, the approaches mentioned above isolate learning elements from TV programs. The approach we propose looks for a new conception of learning through TV,
so as it not only acts as a means of transmission for the courses, on the contrary, the education offered is specific for this medium, taking into account its restrictions and making the most of its potential. Concerning the restrictions, we have to bear in mind both social and technological ones. As the student has just been a viewer for a long time, he/she will probably have a passive attitude when interacting with TV, that is why we have to make education attractive to activate him/her. On the other hand, the contents shown should be in accordance with the technological constraints of IDTV, such as the low resolution of the screen, the fact of using a simple remote control to interact with the programs or the limited features of a set-top box compared with a computer.

Considering these limitations, we will take advantage of the fact that viewers have always conceived TV as a pastime and we will try to offer them education without forgetting entertainment. For this to be possible, we will create learning experiences that combine learning elements and audiovisual ones, i.e. TV programs. This way, we obtain two different types of experiences, those having a TV program as its central axis and the ones whose core is a learning element. Another characteristic of these experiences is their personalization according to user’s preferences and learning background, which is essential in t-learning. In this environment, personalization permits the user to access those contents that are interesting for him/her and prevent him/her from getting lost in the huge amount of contents received, compensating in some extent the typical passivity of the viewer. To compose these experiences, we propose the creation of an Intelligent Tutoring System (ITS), which selects, relates and personalizes audiovisual and learning contents. The design of this ITS constitutes the main goal of the Ph.D. work described in this paper, whose objectives will be presented in Section 2. The process to achieve them is explained in Section 3. Finally, in Section 4 we discuss some related research to this topic.

2 Research Objectives

We distinguish two types of experiences that our ITS should be able to create. The first one deals with ‘entertainment that educates’. Its central element is a TV program, which will be complemented with learning elements (Fig. 1a). To refer to these experiences, we have applied the term entercation. The construction of entercation experiences is initiated by the selection of a TV program interesting for the viewer. In this moment, the ITS has to choose the most appropriate learning elements —from those ones it has access— related to the characteristics of the program and perceived level of interest for the user. We have to take into account user’s peculiarities to make effective the learning experience and avoid him/her getting bored. The selected learning objects will be offered to the user at the appropriate moment during the program and he/she could access them from this moment on. In these experiences, the TV program acts as a hook to engage viewers in education.

The second type refers to ‘education that entertains’. Its central axis is a learning element (Fig. 1b), which will be complemented with TV programs (or segments of these ones) in order for the experience to be more entertaining and attractive for the student. We have used the term edutainment for these experiences. The ITS will create an edutainment experience from a learning element it considers appropriate for the