

Interactive television: Educational use in the new millennium

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Abstract

Interactive television (ITV) has a great deal of potential for facilitating interactive, collaborative, constructivist, situated, and authentic learning. Many teachers, however, are not familiar with the features of ITV, or how it could impact on teaching and learning in Australia. Inherent in its adoption, there are a number of issues which need to be addressed, including the lack of research into current generation ITV, the lack of availability of pedagogically sound, research-driven guidelines for ITV use, and the existing attitudes towards ITV. This paper describes some of the theoretical and practical issues surrounding the use of ITV in the classrooms and concludes with a description of preliminary research.

Keywords

interactive television, ITV, ICT, pedagogy, technology, affordances

A pedagogical problem

The problem of the possible lack of engagement and cognition by learners within 'traditional' learning environments can arguably be addressed by the utilisation of new technologies (McInerney & McInerney, 1998). Interactive television is one such technology that can provide a vehicle for interactive, collaborative, constructivist, situated, and authentic learning.

Interactive television is changing the way viewers 'consume' television content, by giving consumers more choice (more channels), greater viewing control (when and how people watch), more portable media (where people watch), and greater ability to interact with content (Varan, 2004). However, the development, continuing expansion and deployment of interactive television in popular culture, has not been accompanied by a corresponding resolve to understand the nature and potential of its use in educational contexts. And yet, ITV has the potential to impact as significantly (if not more so) on teaching and learning as the internet has over the last decade, and to a much wider audience.

The introduction of any new technology in learning contexts has a typical pattern of adoption, where teachers often revert to old pedagogies as they come to terms with the capabilities of the new technologies, referred to by Mioduser, Nachmias, Oren and Lahav (1999) as "one step forward for the technology, two steps back for the pedagogy" (p. 758). Part of the problem is that technological advances are not accompanied by the kinds of research needed to determine the constraints and affordances of the new system. Further, the absence of defined conventions and procedures makes it difficult for teachers and students to see beyond the technology itself to the learning opportunities. While many studies have been conducted generally on the use of information and communication technologies (ICT) in education, to date, very little empirical research exists on the use of current generation ITV in education (Interactive Television Research Institute, 2003). According to the Interactive Television Research Institute (ITRI) at Murdoch University:

Enormous investment is being made in the iTV industry without adequate understanding of what consumers really want and how they will use the new technology. As yet, there are no established conventions that content developers can utilize in order to design effective iTV content. (2003, p. 1)

Furthermore, in Australia, the highly risky and expensive practice of testing ITV solutions over existing delivery systems, without noteworthy preceding research, is being carried out (ITRI, 2003). These issues need to be addressed, and practitioners, including teachers, need pedagogically sound models for an ITV-based learning environment.

Addressing the issues

The process of addressing such issues, and increasing our understanding of how people learn from ITV, needs to provide practical solutions grounded in a pedagogically-appropriate theoretical framework. This should involve continued development of a theoretical perspective for successful interactivity-based learning, within a socio-constructivist framework. Furthermore, it may need to consider the theoretical approach which Hiltz (1994) labels *technological determinism*, in which the features of a hardware-software system “determine user behaviour and the degree of success of a computer application” (p. 66). Gallant (2000, cited in Finley & Hartman, 2004) asserts that any adoption of technological innovations should be driven by teaching and learning issues rather than by technological determinism or economics. While this is a pedagogically-sound approach, technological determinism, in the guise of ITV affordances, may still be relevant. From a practical point of view, research needs to provide a comprehensive, research-based model for the implementation of ITV in educational settings, one which is able to guide the development of rich, interactive learning environments. Instructional design models incorporating a linear approach are not appropriate here, and should be replaced with non-linear, more constructivist models.

Such research has the potential to be significant for teachers and students because it may provide a current, research-based model for ITV pedagogy, utilising ITV affordances to the maximum extent. It may be significant for educational designers of ITV because it may provide optimal guidelines for pedagogically sound design. It may be significant for practitioners without teaching-related backgrounds, such as ITV broadcast producers, because it will provide pedagogically sound guidelines for broadcast content.

Research into current generation ITV

Some researchers are beginning to address the shortage of research into current generation ITV. For example, Evans, Stacey and Tregenza (1999) carried out a multiple-case study in Australia to investigate the “extent, nature and problematics of educational dialogue through interactive television (ITV) in primary and secondary schools” (p. 215). They suggest that:

[While] usage [of ITV] in schools is generally patchy, the pressures on schools to provide a wide and varied curriculum, and the predicted decline in the numbers of teachers – particularly in specialist areas such as languages other than English – points to ITV, and other communications and computer technologies, adopting a higher profile. (p. 214)

Themes which emerged from the first year of the study included the motivational importance of student involvement in the interactivity elements of the ITV programs, management issues including the need for teachers to receive program notes early enough for them to incorporate them in their curriculum planning, and increasing integration of electronic communication with ITV media. Hopefully, as such themes are explored further, an incidental outcome will be to address any potentially existing negative attitudes towards ITV.

Attitudes towards ITV

Generally speaking, the previously investigated forms of ITV have been little more than modified or enhanced videoconferencing, in which, for example, lecturers and students located at various geographical sites have interacted at a distance through videoconferencing technology. This, coupled with uncoordinated and largely unsuccessful attempts to introduce less sophisticated ITV technology to the home market some years ago (Poole & Bradley, 2003), has led to the occasional problematic misconception that ITV is a flawed, expensive ‘white elephant’ which has largely failed.

Fortunately, with a surge of interest from various interested parties, notably IT companies such as Microsoft and Sun Microsystems, and companies in the position of benefiting financially from the development of ITV, such as cable and satellite television broadcasters, attitudes are changing. Three factors underpin these changes: the exponential growth of the World Wide Web from which a generation has learned how to use interactive techniques and tools, increasingly cheaper, smaller, and more affordable computer technologies, and the intervention of standards organisations such as the Advanced Television Enhancement Forum (Poole & Bradley, 2003).

Use of current generation ITV

Current generation ITV provides direct links from television programs to integrated Internet based content (Poole & Bradley, 2003). There are two basic formats, interactive overlays and reduced picture, which each have advantages and disadvantages. ITV development is similar to DVD Video development, with two exceptions: the video is continuous even while interacting with other content, and viewers are constantly linked to the Internet so permitting a wide range of interactive options (Poole & Bradley, 2003). These exceptions comprise part of the affordances of ITV.

ITV is being used successfully in Victorian schools to deliver a range of educational content (Schools' Television, 2004). Live interactive programmes are broadcast, utilising telephone, fax and email in real time, with website interactivity features sometimes included. Television networks are "tapping the deep educational potential by providing immediate links from programming to related content, such as background information and research" (Poole & Bradley, 2003, p. 414).

During the last twelve months, BBC-TV in the UK has broadcast two new series with sophisticated ITV applications, *Light Fantastic*, which provided historical, scientific and technological information about light (BBC-TV, 2005), and *Space Odyssey: Voyage to the Planets* (BBC-TV, 2004b). In conjunction with the broadcast of *Light Fantastic*, a real-time guide to the stars was offered (BBC-TV, 2004a). During the *Space Odyssey: Voyage to the Planets* broadcasts scientific information was also available via interactive TV and the web, and ITV technology enabled viewers to be "transport(ed) ... to the heart of the European Space Agency's mission control room" (BBC-TV, 2004c). Viewers were also able to submit questions via their set-top box return path, email, or SMS (BBC-TV, 2004d). The questions were answered by experts such as rocket scientists, astronauts, and programme makers in a live broadcast from the European Space Agency Mission Control (BBC-TV, 2004d).

Further evidence of the increasing profile of ITV is its inclusion as a media type in the *British Academy of Film and Television Arts (BAFTA) Interactive Awards: 2004/5* categories for excellence including:

Best use of digital media to deliver factual information...the best e-learning work aimed at children under the age of 12...the best e-learning work aimed at life-long learning and not specifically for children...[and] the most creative and effective use of interactive TV across any genre or platform. (BAFTA, 2004, p. 1)

It is against this background that the current paper asks not 'Can ITV be used to enhance learning in the new millennium?' but, rather, 'How can ITV be used to enhance learning in the new millennium?'

In an attempt to answer this question, research is being carried out into the educational applications of ITV. It comprises a multiple case study of ITV broadcast sites, as well as interviews with ITV experts. Affordances of ITV that facilitate the design and delivery of socio-constructivist learning environments are being investigated in depth. The research is currently in the data collection and analysis phase, and several interviews with key players in interactive television have been undertaken. Early impressions confirm findings from the literature that suggest contextually appropriate, effective content management is a crucial issue. Preliminary data also indicate the need to determine the features of ITV that make it truly engaging for the user. The research will continue to explore the potential use of ITV for content delivery, synchronous and asynchronous interactions, expert consultation, multiple perspectives of issues, collaboration, complex tasks and problem solving. Critical pedagogical characteristics of ITV programme design and broadcast will be ascertained as an outcome of the study. The key purpose of the study is to provide guidelines to educators to facilitate the design and development of ITV learning environments. It is hoped that such research will contribute to understanding of how ITV can be used in engaging and educationally relevant ways in schools. It is timely for the revolution in television viewing to make its way to the classroom — not as entertainment, but as a powerful, cognitive tool of great significance.

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