AmbiLearn:
Multimodal Assisted Learning

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ABSTRACT

In educational institutions computing technology is facilitating a dynamic and supportive learning environment for students. In recent years, much research has involved investigating the potential of technology for use in education and terms such as personalized learning, virtual learning environments, intelligent tutoring and m-learning have brought significant advances within higher education but have not propagated down to Primary Level. This paper discusses AmbiLearn, an ambient intelligent multimodal learning environment for children. The main objective of this research is to redress the limited use of virtual learning environments in primary school education. With a focus on multimodal presentation and learning environments, AmbiLearn explores the educational potential of such systems at Primary school level.

Keywords: AmbiLearn, Computing Technology, Learning Environments, Multimodal Interfaces, Serious Games

INTRODUCTION

A learning environment is an environment where a person can learn or gain knowledge on a particular theme or topic. Traditionally, learning only took place in a classroom setting where instruction or pedagogical information was provided by a teacher/lecturer. As technology has become more powerful, accessible and more pervasive, learning has migrated out of the classroom setting. In educational institutes today the use of Virtual learning environments (VLEs) has become predominant in providing an online environment for administration of course material and student assessments. However, the use of virtual learning environments in primary schools is very limited. Key findings in a study by Ofsted (2009) may suggest that this is due to the lack of the material available in relation to the range of topics covered. The presentation style of the pedagogical content also contributes to the limited use of VLEs as many of these provide information through static downloadable word documents where interactivity is limited. The focus of this research is to develop a multimodal learning environment assisting learning which is designed specifically for children. AmbiLearn combines successful techniques from virtual learning environments, serious games and multimodal interfaces. As a multimodal learning environment AmbiLearn aims to support collaborative learning with a DOI: 10.4018/jaci.2011010106
general educational aim of encouraging children in their own learning and enabling them to take responsibly for that learning. This paper provides a review of the literature on learning environments and how they can be used effectively. Preliminary work on AmbiLearn is presented and a sample application, TreasureLearn, is described. The paper concludes by outlining future work.

VIRTUAL LEARNING ENVIRONMENTS

The term ‘technology enhanced learning’ is used to cover all methods of using technology as a foundation for learning such as: m-learning, e-learning and web-based learning. O’Malley et al. (2003, p.1), define m-learning as “any sort of learning that happens when the learner is not at a fixed, predetermined location, or learning that happens when the learner takes advantage of the learning opportunities offered by mobile technologies.” Similar to this, e-learning can be defined as electronic learning where the learning is based upon some form of technology including, but not limited to, mobile technologies. All these concepts can encompass the use of the VLEs. In the UK most if not all of the further and higher education institutes are using a VLE such as Blackboard or Moodle. In this context the VLE is providing opportunities for distant learners, access to course content at any location, any time. Students can catch up on missed lectures/classes, submit assignments and receive feedback at any time. This style of usage enables students to be in constant contact with the course and collaborate with other class members with for example chat boxes and open forums. JISC (2009) provide a comprehensive study of the different uses of virtual learning environments in higher education across multiple disciplines such as economics, medicine, dentistry, business, management and health science. Testimonials from both staff and students indicate high levels of satisfaction with the learning process and many suggest the results indicate a significant improvement in student learning. With each environment suited to a particular domain, it is not easy to identify which learning environment has most educational potential. A common theme amongst each is the method of providing the pedagogical content which makes it effective. An investigation of interactive multimodal learning suggests that “the most effective learning environments are those that combine verbal and non-verbal representations of the knowledge using mixed-modality presentations” (Moreno & Mayer, 2007). Since 2005 Becta has referred to the VLE as a ‘learning platform’ which suggests a greater emphasis on the presentation of content (Berry, 2005). The different presentation style of pedagogical content can be deemed as the critical feature needed for VLEs to be appropriate for children, supporting both auditory and visual learning styles, as demonstrated by the use of educational games.

Games as the Learning Environment

In Northern Ireland, all primary and secondary schools funded by the Department of Education and Learning (DEL) have access to the C2K network (C2K, 2010). Within this network there are resources such as educational games compatible with the aims and objectives of the Northern Ireland curriculum. In the past such edutainment software has been met with much criticism as well as some enthusiastic support. There was much hype when educational games were first released, yet educators were reluctant to adopt them. Recent studies suggest that video games promote the development of skills such as strategic thinking and creativity, offering appropriate and adaptive feedback and the embedding of cognitive strategies that can reduce task time, increase achievement and have a positive effect on student learning (Booth, 2009; Rosas et al., 2003). Mc Farlane et al. (2002) suggest that by providing a fun, playful approach games can facilitate learning in three ways: learning as a result of tasks stimulated by the content of the games, knowledge developed through the content of the game and skills arising as a result of playing the game.
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