ABSTRACT

In this paper, the special needs/requirements of disabled students and cost-benefits for applying blended learning in Personalized Educational Learning Environments (PELE) in Higher Education are studied. The authors describe how blended learning can form an attractive and helpful framework for assisting Deaf and Hard-of-Hearing (D-HH) students to learn and communicate. The described blended learning experiment integrates face-to-face, synchronous, and asynchronous e-learning, bilingual teaching (oral language and Sign Language) in the mainstream class, teaching in parallel classes, and personalized access to distributed databases of educational material. At the core of PELE, the authors use Multimedu, a web-based tailored made tool for disabled students. This experimental tool includes applications of a traditional Learning Management System (LMS), supporting a multilingual dictionary of terms, multimedia management and social networking. Finally, this paper describes the use of the blended e-learning model in “Database I” course, given at the Technological Educational Institute of Athens, Greece.

Keywords: Assistive Learning, Bilingual Teaching, Blended Learning, Personalized Learning, Wireless Learning System

A blended learning approach is the integration of asynchronous Internet technology with synchronous face-to-face learning. The two different, historically separate education methods should be optimally integrated in a planned, pedagogically valuable manner (Laster et al., 2005). Blended learning aims at providing learning ‘for each and every individual, not just at work, but in schools, universities and even at home’ (Thorne, 2003, p.18).

Numerous surveys have been conducted on the effectiveness of blended learning in higher education (Benson & Anderson, 2010; Davies, & Hardman, 2012; Vaughan, 2007). The reported results conclude that blended learning engages students more effectively in

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the learning process, increasing student understanding of course material and improving student grades. It is interested that in the survey reported in Davies and Hardman (2012), three percent of the participating students had learning disabilities and three percent had physical disabilities. According to their findings, students prefer blended learning to solely face-to-face or solely online learning. Moreover, students are satisfied with the flexibility to learn at their own pace and better manage course loads and other outside responsibilities. Concerning the instructors’ suggestions, blended courses create enhanced opportunities for teacher-student interaction (Vaughan, 2007), maximizing instructor efficiency, even though preparing blended learning material is time consuming and labour-intensive (Benson & Anderson, 2010). This is due to the fact that courses need to be redesigned and instructors need to acquire new teaching and technology skills (Vaughan, 2007).

Bersin (2004) proposed two models to be used in blended learning: the program-flow model and the core-and-spoke model. In the program-flow model, the student follows a pre-defined sequence of learning “steps” (activities) as occurs in the case of traditional university courses. The last “step” of the model is usually related to the evaluation process. Such a program-flow model should be based partially on face-to-face learning and incorporates learning activities conducted by the student on her/his own. In the core-and-spoke model, the core of the learning activities is given and additional material (exercises, etc.) is offered to support, complete, and extend the core approach.

Deperlioglou and Kose (2010) believe that it is better to use the program-flow model during the transition from face-to-face teaching of Computer Programming to a blended learning approach. The core-and-spoke model is appropriate when it is used for motivated and experienced students.

Students with disabilities can benefit from the blended learning approach in varied ways, especially when using modern multi-purpose handheld devices such as WebPads, Tablet PCs, Personal Digital Assistants (PDAs) and smartphones, to access educational content and share information with others. Deaf and Hard-of-Hearing (D-HH) learners can take advantages of the rich visual content of mobile devices (Vinci & Cucchi, 2007). Moreover, vibrating alerts, flashing LEDs and flashing displays can enable accessibility for D-HH learners (Rainger, 2004). Case studies presented in (Smith, 2008) illustrate the different kinds of benefits that disabled students have experienced using mobile devices for learning. Many challenges, though, emerge from any effort to integrate these devices into educational scenarios to support people with disabilities.

Jane E. Jarrow, the president of Disability Compliance in Career and Online Learning, believes that “the increase in distance education and blended courses presents a unique opportunity for institutions to embrace universal design” (Disability Compliance in Higher Education, 2011). All students, disabled or not, choose to use Web tools in a way that works best for them. Jarrow suggests that institutions can learn from students’ styles of using a website and design online learning environments that provide students with choices of use from the beginning. The instructors have to see the challenges that students with disabilities might encounter and how they can be overcome.

OBJECTIVE

Previous work that has been reported by the authors (Marinagi & Skourlas, 2011; Marinagi, Sarinopoulou, & Skourlas, 2011) emphasized the technical description of the architecture of a secure wireless distributed system for Personalized Educational Learning Environments (PELE). The implementation of the proposed framework enables the inclusion of students with disabilities and learning difficulties into mainstream classes at the Technological Educational Institute of Athens, Greece. The system is supported by a scheme of servers including personalized servers, servers for multimedia educational material and servers for supporting the inclusion of students with disabilities and learning difficulties in the mainstream class (Marinagi & Skourlas, 2011). Experimental
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