ABSTRACT

Technological advances during the last decade have provided huge possibilities to support e-learning. However, there are still concerns regarding Return-on-Investment (ROI) of e-learning, its sustainability within organizational boundaries and effectiveness across potential learner groups. Much previous research has concentrated on learners’ motivation, satisfaction, and retention. This leaves room for further research to identify alternative and innovative ways to center design on students’ concerns when learning online. The authors’ work focuses on designing workable courseware usability evaluation methods to differentiate students to improve learning-support frameworks from both pedagogical and system perspectives. The authors’ results suggest that students can be grouped in three clusters based on their motivation to e-Learn. Instructors could predict which cluster a new student belongs to, making it possible to anticipate usability issues that most affect results. This also facilitates pedagogical interventions that could help at-risk learners, contributing to the retention rate.

Keywords: Learning-Centered Framework, Motivation to e-Learn, Student Clustering, Usability Evaluation Method

INTRODUCTION

Cost-effective approaches are of specific relevance for organizations. This effectiveness is measured by both the achievement of learning, students’ and teachers’ attitudes and related cost-effectiveness. By definition, cost-effectiveness focuses on comparing different ways of achieving the same objective. The most effective choice is the least costly of the compared alternatives. Its organizational impact occurs on three levels. At an individual level, cost-effectiveness comes mainly from each student learning at their own pace, with content delivered just-in-time in accordance to special needs and life-stage in education, professional...
development and language training (Hjeltnes and Hansson, 2004). At a societal level, the development and delivery of high-quality and interactive learning content is better controlled when articulated with key players, since that will add more value to skill development and foster economic growth. At the institutional level, cost-effectiveness comes from better and greater administrative flexibility, the reduction of geographical barriers, lower teacher/student ratios and economies of scale, which lower the cost per student through re-use and modularization of learning content, requiring fewer specific instructor interactions. The critical point is not only to reach cost-effectiveness but also sustain it over time, which requires both investments to update and upgrade content and infrastructure, and to develop instructors’ skills to produce high-quality, interactive content suited to students’ needs and provide performance feedback. To achieve this, cost-effective approaches have to provide mechanisms to match their design with the needs of learners, teachers, society and institutions while requiring less resources than other institutions that meet these criteria (Hjeltnes and Hansson, 2004). That is why the main goal of this research is to identify predictive models for e-learning to support such cost-effectiveness.

E-learning brings the promise of delivering cost-effective education in an innovative way by improving pedagogy, resource-allocation, content development, student access practices, potential cost reduction and revenue growth. Though e-learning in recent years has grown significantly, organizational concerns prevent its adoption as a strategic component for either skill development or education, due to its disruptive impact on internal practices, culture and infrastructure. Other relevant concerns include return-on-investment (ROI), the quality of learning content, the accreditation of results, student retention, the engagement of faculty in online learning and the integration of e-learning platforms with operational systems that support student registration or human-resource management practices. Thus, many organizations are still experimenting with e-learning even though there is no solid business model grounded on empirical evidence. Some organizations have implemented blended-learning initiatives to test the concept within their boundaries. This has been done in a fragmented manner without consistent monitoring, and with partial results and high start-up costs (O’Neill, Singh and O’Donoghue, 2004). Whilst organizations are learning to measure results, creating and sustaining cost-effective learning supported by technology is still an obstacle for organizations, including Higher-Education institutions, their managers and development teams (Bischel, 2013; Harris, 2010).

Literature shows that most work so far has focused on developing courseware tailored to individual cognitive or learning styles and analyzing objective performance measures (Britain & Liber, 2004). Though both have benefited individual learning, on one hand, identifying learning styles is time-consuming for students and raises both ethical and governance concerns for institutions. On the other hand, using performance measures have provided inconclusive evidence on the effectiveness of online pedagogies, making it hard to extract sound theoretical foundations to define quantitative design guidelines. Also, there is a need to better understand the role of learning contexts on student results, covering social, cultural and historical aspects (Blandin, 2003; Preece and Rogers, 2002; Pillay, Clarke and Taylor, 2006). Moreover, during the last decade there was an increasing research interest in defining new measures related to attitudes, motivation to learn, emotions, and satisfaction in Technology-Enhanced-Learning (TEL) scenarios (Pillay, Clarke, and Taylor, 2006; Šumak et al., 2011; Zaharias & Poulomenakou, 2009). To this end, research efforts indicate that the usability evaluation of TEL experiences should be performed in a more holistic and integrated manner to support the notion of learning-centered design (Costabile et al, 2005; Mehlenbacher et al, 2005; Venkatesh et al, 2003) and must provide timely information to instructors for the early definition of pedagogical interventions.
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