

# Innovation in Web-Enhanced Learning

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## INTRODUCTION

While virtual universities and remote classrooms have captured the headlines, there has been a quiet revolution in university education. Around the globe, the information and communications technology (ICT) infrastructure needed to support Web-enhanced learning (WEL) is well established, and the Internet and the World Wide Web (the Web) are being used by teachers and students in traditional universities in ways that complement and enhance traditional classroom-based learning (Observatory of Borderless Education, 2002).

The Web is most frequently used by traditional universities to provide access to resources—as a substitute for, or complement to, notice boards, distribution of handouts, and use of the library (Collis & Van der Wende, 2002). Therefore, most of the change has been incremental rather than transformational. Adoption of WEL has yet to meet its potential—some would say the imperative (Bates, 2000; Rudestam & Schoenholtz-Read, 2002)—to change the nature of learning at university and to transform the university itself.

## BACKGROUND

WEL makes a difference when it is used to improve learning, for example, when it is used to enable collaborative learning (Hamilton & Zimmerman, 2002; Klobas & Renzi, 2003; Rudestam & Schoenholtz-Read, 2002). Nonetheless, computer-supported collaborative learning (CSCL) that makes a difference does not require expensive technologies (Hazemi & Hailes, 2002; Hiltz & Turoff, 2002).

To achieve effective, substantial, system-wide change through the adoption of new educational technology, universities must pay attention to more

than the ICT infrastructure. Attention must also be paid to educational values, resources, and transformation of educational processes and organizational structure. Thus, WEL is more than new software and systems—it is organizational innovation.

Observers of the effect of technological change on universities emphasize the *factors* associated with effective change. These factors include reexamination of assumptions about pedagogy (Leidner & Jarvenpaa, 1995; Rudestam & Schoenholtz-Read, 2002), vision and leadership to implement large-scale organizational change (Bates, 2000), adequate financial resources (Surry, 2002), attention to development of human resources and reward systems (Collis & Van der Wende, 2002; Pollock & Cornford, 2000), student aptitude and preparation (Palloff & Pratt, 2002), and professional management of suppliers as well as internal ICT infrastructure (Klobas & Renzi, 2003). Less is known about the *process* of change.

Rogers (1995) proposes a generic model of the process of organizational innovation. Innovation is initiated through identification of organizational problems and the matching of potential innovations with problems. The relevant innovation may be an idea, a process, a technology, or a combination of these (Spence, 1994). The end of the initiation period is marked by a decision to adopt (or reject) the innovation. Subsequently, during the implementation period, the innovation and the organization undergo some mutual redefinition (Orlikowski, 1992), the organizational role of the innovation is clarified, and its use finally becomes such a familiar part of the organization's activities that it is no longer recognizable as an innovation. Table 1 summarizes these aspects of the innovation process.

In this article, we study the process of WEL adoption at a traditional university using Rogers' (1995) model of organizational innovation as the organizing framework. More detail of the case study

*Table 1. Rogers' (1995) model of organizational innovation*

STAGE	ACTIVITIES	
I. INITIATION		
	Agenda-setting	The organization becomes aware of problems that are perceived to require resolution through some form of innovation
	Matching	A fit is found between a problem from the organization's agenda and a specific innovation
	<i>DECISION</i>	<i>The organization decides to implement the innovation (or not to go ahead)</i>
II. IMPLEMENTATION		
	Re-defining/ Re-structuring	The innovation is re-defined and the organization re-structured in a mutual process of reinvention and restructuring as a fit is sought between the innovation and the organization
	Clarification	The relationship between the organization and the innovation is clarified
	Routinizing	The innovation becomes routine

described here can be found in Klobas and Renzi (2003).

## **A CASE STUDY IN EDUCATIONAL INNOVATION**

In 1998, Bocconi University, a private (non-profit) business university in Milan, Italy, announced the adoption of WEL to support new approaches to teaching. At the time, this single faculty university had around 12,000 students and a well-developed ICT infrastructure for Internet access. Quality of education is important to the University, which has a reputation for high standards and outstanding completion rates.

### **Agenda Setting**

Several events contributed to setting the agenda for the change. In 1997, the Italian government announced significant changes to the educational system. Instead of offering the centuries-old mix of short (three-year) and long (four- to six-year) first degrees, a two-tiered system of a three-year first degree plus a two-year higher degree would be offered from the academic year beginning in October 2001. At the same time, the University was planning for significant growth and examining ways to further improve the quality of education.

### **Matching**

The University was aware, through teachers' experiments with online learning and multimedia, of the potential for e-learning platforms to enable more active student involvement in learning. In May 1998, the University's Multimedia Committee established a working party to introduce a platform for WEL. The cross-functional working party consisted of all the people needed to implement an initial pilot project, including pilot teachers, the group in charge of technological infrastructure design and implementation, and those responsible for computer center operations. The working party was thus able to monitor, from its initiation, all aspects of project feasibility. The most senior figures in University administration (the Managing Director) and teaching and learning (the Pro Rettore for teaching) participated in working party meetings where key decisions were to be made. Information was therefore exchanged directly and decisions made quickly. All involved in the project were personally involved in planning and shared responsibility for project's success.

### **Goal Setting**

Throughout the matching period, and indeed throughout the project, the innovation was defined as e-learning or WEL for on-campus students, rather than software adoption. The project was therefore a busi-

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