

Chapter 12

Including Nomadic People in Collaborative E-Learning: Experiences in Research Projects

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ABSTRACT

The focus of this chapter is the design of a solution for Computer-Supported Cooperative Learning (CSCL) that is able to connect both stationary and mobile users in live shared-learning sessions. The authors started from experiences that were mainly technology-driven to arrive at the development of two subsystems, OpenWebTalk and MobileWebTalk, that build, flexibly and simply, mixed reality environments in which users cooperate to perform the same learning task. From these experiences, the authors argue that heterogeneous learning environments (stationary and mobile) can only be really effective if they are designed from a unique abstract model. Therefore the challenge is to derive a conceptual model to describe a collaborative learning session that can be deployed in different devices.

INTRODUCTION

Traditionally, collaborative work and learning have been supported by groupware tools called Computer-Supported Cooperative Work (CSCW).

The term CSCW was first coined by Irene Greif from MIT and Paul M. Cashman from DEC in 1984, at a workshop attended by individuals

interested in using technology to support people in their work.

According to Baecker, Grudin, Buxton and Greenberg (1995, p. 141), Computer-Supported Cooperative Work or CSCW is computer-assisted coordinated activity carried out by groups of collaborating individuals.

Examples of CSCW are: communication between instructors and trainees (simulation and training applications), data sharing (for visually

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supported discussion by scientists or decision-makers), support for innovative teaching and learning, and support for collaborative learning.

One of the commonest ways of conceptualizing CSCW systems is to consider the context of a system’s use. One such conceptualization is the CSCW Matrix, first introduced in 1988 by Johansen and also appearing in Shen and Dewan (1992). The matrix considers work contexts along two dimensions: first, whether collaboration is co-located or geographically distributed, and second, whether individuals collaborate synchronously (at the same time) or asynchronously (not dependent on others being around at the same time).

In this matrix, Collaborative Virtual Environments (CVE) systems are listed as Virtual Worlds in the *Remote Interactions* section.

In fact, CVE can be seen as the result of the convergence of interests and research studies in both virtual reality and Computer Supported Cooperative Work fields. CVEs are applications that (re)create a multi-user virtual world, according to Damer (1997), as two- or three-dimensional graphical environments inhabited by users (represented by digital actors called “avatars”) that share with other users time, space and actions, cooperating together for a common goal.

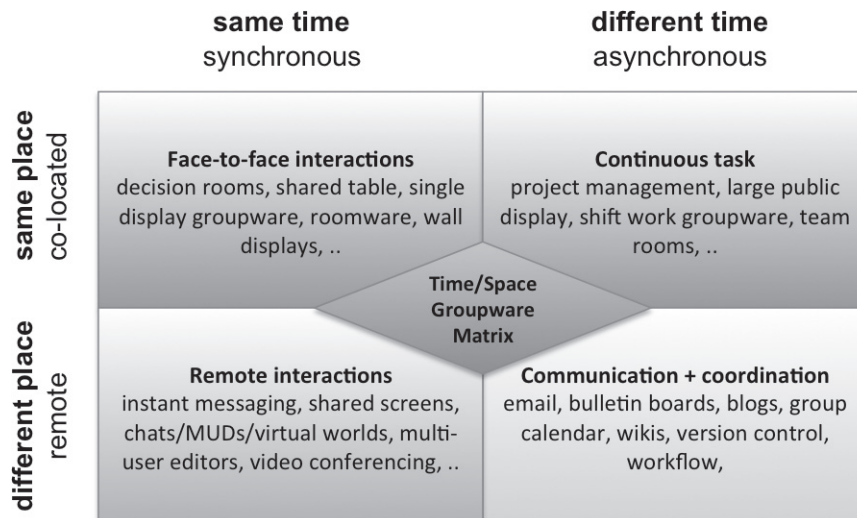
The classification provided in Figure 1 tends to give a general homogeneity of devices used in the interactions. In other words, it is supposed that all the people involved in the cooperation use the same technical environment and devices, the same software user interface and interact in the same way with the software system.

On the other hand, mobile technologies are increasingly offering new opportunities for “any-time, anywhere” computing, allowing users to access information, and collaborate with colleagues far from their desktop station. This emergence of mobile devices and new forms of connectivity allows new forms of collaboration, not limited to the traditional stationary workstation but tailored to the capabilities of these new devices supporting ubiquitous cooperation.

In this context, the previous matrix should be modified by the addition of one more dimension, “user interface interaction,” that differentiates the homogeneous collaboration forms from those characterized by the use of different devices (multi-device) or different forms of presentation and interaction with the user (multi-modality).

We believe that properly designed shared workspace applications can be as useful in supporting mobile users as they are for non-mobile

Figure 1. Time and Space Groupware Matrix



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