StoneSoup: A Contextualized Portfolio System

Jenny Robins

Graduate School of Library and Information Science University of Illinois Urbana Champaign

jrobins@uiuc.edu

ABSTRACT

Teaching and learning are social interactions that are impacted by contextual, situated factors within the learning environment. These factors include the past and present circumstances of the participants, their psychological and social characteristics, and the physical characteristics of the environment. Contextualized technological systems that take these factors into account. This paper contrasts contextualized and traditional computing. A description of the StoneSoup digital portfolio system is provided as an example of a contextualized CSCL application.

Keywords

CSCL, CMC, CSCW, context, situated, contextualize, portfolio, information structures, collaboratory

INTRODUCTION: THE IMPORTANCE OF CONTEXT

Teaching and learning are interpersonal activities that can be viewed as contextually situated. People draw on contextual understandings when making decisions about actions to take, and in interpreting the actions and responses of others (Dourish, 2001; Orlikowski, et al., 1995). Context refers to the environment in which interactions between people, or between people and things, emerge. It is understood in terms of both past and present circumstances. Context refers not only to physical characteristics, but also to psychological, historical, and social characteristics. It includes tasks to be accomplished, with their attendant goals, activities, and processes (Engeström, 1990; Nardi, 1996). Context is the stuff descriptions are made from, having to do with concrete circumstances, not abstractions. For example, from a physical perspective, K12 schools might seem contextually uniform. School buildings are easily recognized. But, when context is viewed holistically, schools and their classrooms vary widely and this impacts the type and extent of the adoption of computer supported collaborative learning (CSCL) technology. Improving the fit between technology and its application in the classroom means designing technologies that are more contextualized. This research addresses contextualized CSCL.

CONTEXTUALIZED SYSTEMS

In a traditional computer application, the system is designed with the view that goal states exist, and having been predetermined, procedures leading to these states can be coded into computer algorithms. This has resulted in work practices, organizational practices and physical environments that are designed around the functions of the computing system. In effect, computers order the environment, and humans obey the computers (Suchman, 1987). However, technology can be made to recede into the environmental background, while practices that draw on human skills, physical abilities and social practices can be fore-grounded. Computing systems can be made compatible with the social, organizational, cultural, physical and temporal activities of the people they serve, i.e. they can be designed to support contextual factors (Dourish, 2001).

Contextualized design takes advantage of the power of today's computers to create computing systems that emphasize flexibility over efficiency. Contextualized computing gives users the power to tamper with the system, execute it and circumvent it. It supports them in applying and adapting the system to the situation at hand (Schmidt & Bannon, 1992). One way to do this is to build computer systems as toolkits rather than monolithic applications. As opposed to one-size-fits-all packages, toolkits consist of small, stand-alone components that can be fitted together, as needed, by users through a bricolage process. Toolkits can also be made extensible, allowing users to add new components as they became available or remove components for use with other infrastructures. By configuring toolkits, users become co-designers of contextualized systems, adapting them to specific environments and needs (Dourish & Edwards, 2000). Rather than producing finished systems, this allows for the development of co-evolving social-technical environments. These bricolage systems enhance the role of users in computing systems and the role of computers in human systems. Computers can do the things that they do well, while humans do the things for which they are best suited.

While there is a need for increased flexibility in computing systems, there is a corresponding need for ways to represent that flexibility to users. One way to address the problem of representation in contextualized, bricolage systems is through the use of mediating information structures. These are structures that are meaningful to humans, but can also be interpreted by computers. Information structures organize and direct expectations regarding the presentation of information. Information structures impact human systems because of the way they are able to mediate between fixed objects, like documents and software, and flexible social practices (O'Day & Nardi, 2001). An information structure that can play multiple roles in a bricolage system is a common list. Creating lists is something humans are particularly good at. Processing lists is something computers are good at. Thus a list can function as a communication medium between humans and between humans and computers.

THE STONESOUP DIGITAL PORTFOLIO SYSTEM

StoneSoup portfolio units consist of student answers to a list of questions about their learning processes, activities and products. The StoneSoup digital portfolio system is a flexible, evolving tool that runs on a browser infrastructure. A digital portfolio system requires a critical mass of participating school districts in order for student information to be broadly available. However the learning objectives of school districts vary widely. Therefore, the system must simultaneously support the needs of numerous participating districts. At the same time, portfolios must be uniform enough to be processed across districts. Using StoneSoup, school administrators can adapt the question list so that it meets their learning objectives. Teachers have control over which questions are assigned to students and how long student answers need to be. However, the list remains consistent because, in all instances, StoneSoup uses a simple two-dimensional information structure. Portfolio questions can be answered using pencil and paper. But if the answers are input through an HTML form, they are stored as XML units on a school's local server. Answers can then be retrieved as HTML documents. These documents have a header that is customized for the school district, and answers are displayed using a standardized format. A centralized index to the XML units links student portfolios in all participating school districts, making them available when students transfer to new schools. Student units can be text-mined for resources and activities related to lessons units, giving StoneSoup a secondary role as an educational collaboratory. Visit StoneSoup at: http://www.stonesoop.org.

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