

Social Computing and Collaborative Learning Environments

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Abstract

Social experiences and interaction can be critical to the conceptualization and design of a collaborative learning environment. Social computing offers a theoretical context for investigating the ways in which the environment can create rich social experiences that serve as a foundation for building effective learning support.

1. Introduction

Standardization of collaborative learning environments involves a multi-dimensional and interrelated set of specifications and decisions that go beyond the platform, technical and information format issues that appear to be central to many discussions on standardization. Several questions and concerns are key to the standardization process:

- What is learning and how is it supported?
- What activities can be supported in a collaborative learning environment?
- What metaphors or interfaces should be used to make an environment usable, flexible, understandable, and comprehensive while supporting a wide range of learning activities?
- How does the environment engage students so they will want to actively participate?
- How does the environment create a rich social experience for students and teachers?

2. Social Computing

While learning is core to the discussion and is an essential component of a collaborative learning environment, it may not actually be the starting point for its design. Social experiences and interaction can be critical to conceptualization and design of the environment and may actually serve as a better starting point in the design and implementation of standards. Many students who use existing web-based collaborative tools to support learning

describe these environments as lifeless and dull. Their sense of the other students and the teacher is limited in such a way that they have no real sense of others and do not feel engaged. Social computing offers a theoretical context for investigating the ways in which the environment can create rich social experiences that serve as a foundation for building effective learning support.

Social Computing refers to using information systems as "places" for social interaction as well as "spaces" for data collection and manipulation. Social computing occurs as awareness, communication and collaboration in virtual places, and is organized by time, object affinity and proximity. Social computing is found at the intersection of computer networks and social networks.

Social computing entails (1) viewing computation as a medium for communication between people, (2) appreciating that human-computer interaction is set within a context of social practice, and (3) understanding sociological processes as part of the design of interactive systems.

3. CSCW

Interactive networked games and Computer Support for Collaborative Work systems (CSCW) represent using social computing for entertainment or to support a problem solving or work process.

Increasingly social scientists are showing that human actions are organized in response to the features and conditions of the social context in which the actions arise. Creating, discovering and reasoning with knowledge (actions within information systems) happen in a social context. Here the term "social" does not simply mean direct interaction with other people, but also includes the contribution of society and culture to the features and conditions of the settings. Recognizing that human activity is social suggests that our knowledge-base about how humans use computers to create, discover and reason with knowledge will be advanced by studying information

systems as social mechanisms and communication media in the context of real activities and experiences. Similarly, recognizing that human activity is social argues for using our understanding of social factors and processes in the design of information systems. Understanding social computing as an aspect of the acquisition and utilization of knowledge, as well as using these new understandings to advance our design and development of information systems, is an important part of the design of an effective collaborative learning environment.

A social computing and collaboration architecture must include specifications and high level application development support for the following kinds of constructs and capabilities:

- representation of user presence and action
- representation of place
- formation and representation of groups (contexts of collaboration and action)
- social rules management
- communication
- collaboration facilities
- notification
- ubiquitous access
- human-computer interface (HCI) elements
- learning environment constructs

Discussed below, these specifications point to a set of standards quite unlike those currently in use.

4. Standardization for Social Computing and Collaboration Architecture

Throughout our day in the real world we work in “places” and in those places we are aware of the “presence and action” of others. That total context of place and awareness of people in those places determine how we work. I may go ask a nearby colleague for help if she doesn’t look busy. I may see someone using a laptop similar to mine and, if they look friendly, I may begin a conversation about the laptop and how they like using it. A Virtual environment that does not incorporate these notions of context will appear to its participants as lifeless, dull or dead. It does not engage the user and it loses the value it may otherwise offer through this contextual information.

Social rules are part of every context and determine every possible action a user can take in the system. The social rules must be enforced throughout all levels of the system and must be flexible and able to support high levels of complexity. The representation of the social rules to the user must allow them to understand the rules and they must know what they can and cannot do if they are to find the system usable.

The social computing and collaboration architecture described above must be integrated with learning environment architecture to enable social computing in education. Learning technology architectures (such as those documented by IEEE) and Learning Design specifications (such as under development by IMS) take a benign stance toward social context. In general they have a conceptual model of a learner and the delivery of learning resources potentially mediated by a coach. The coach is essentially a process that theoretically can be automated. In IEEE the roles for humans is an informative sub-clause, not a normative one, indicating that it is optional. This framework makes sense to articulate learning as an interaction between human and machine, but as described earlier, it is inadequate to specify learning in social contexts. We believe it is necessary to extend and integrate social computing with the work of IEEE and IMS. In essence it is desirable to take the foundations of learner goals, activities and evaluation set by the architecture and standards’ committees and place them in a social context.

5. Conclusion

Picking the starting point for the design of a collaborative learning environment drives the design process. The foundation on which other elements of the system are built determine the capabilities and interactions of these elements. Starting with social computing as a framework for thinking about the design makes user presence, action, communication and the enforcement of social rules a set of critical capabilities for every component of the system. Doing so may help allow the system to offer a rich and engaging experience for learners and teachers, an experience uncharacteristic of many current e-learning environments.