Supporting Social Awareness: 
Requirements for Educational CVE

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Abstract 

Social awareness is essential for effective learning. However, natural environments do not always provide optimal support for it. We look at the potentials of Collaborative Virtual Environments (CVE) in this context and provide a set of requirements for educational CVEs based on the needs of learning communities. We also present a prototype based on these requirements.

1. Introduction

The notion of community in education has not been fully exploited. However, communities are a reality within any learning context. Students share knowledge not only with the persons in the same class or group. They rather rely on a complex network of communities spontaneously emerging within any educational context.

Communities are social aggregates that are fluid and emergent [7]. It is therefore difficult for community members to get an overview of the existing social structures. This is a problem because awareness of e.g. experience distribution and community membership creates occasions for knowledge sharing. Lack of this awareness creates continuous breakdowns in the flow of knowledge and it impacts negatively on learning. Hereafter we use the term social awareness to indicate awareness of the social situation in a group or community in a shared environment, including knowledge on learners’ roles, activities, positions, status, responsibilities, social connections and group processes.

The mechanisms for promoting social awareness in everyday life, like chance encounters, message boards, verbal and non-verbal cues [5], are not always sufficient due to, e.g., physical distances, different schedules, social inhibitions and non-optimal learning spaces. Various groupware tools have been used to promote awareness [4], but they mainly focus on supporting already established groups rather than fluid communities [6].

In this paper we discuss the possibility to use Collaborative Virtual Environments (CVEs) for creating an infrastructure to increase social awareness in communities of learners. In this case, CVEs must be designed taking into account the social nature of learning. Socio-cultural theories, especially Activity theory, have lately been proposed as a theoretical framework for the design of CSCL systems because they emphasize the social nature of work and learning, e.g. [3]. Activity theory is based on the idea that culturally defined tools mediate all activity, so learning is participation in cultural practice. Individuals and groups can be seen as “subjects” situated in communities mediated by rules of participation and division of labour [2]. According to Wenger [7], “communities of practice can be thought of as shared histories of learning”. Each activity is situated on a learning trajectory, so that students move through activities, progressing from partial to full participants [3, 7]. Continuous negotiation of meaning is the core of social learning and involves two processes: participation and reification, together forming a shared repertoire.

Another concept key to social learning is identity. Wenger [7] argues that learning should be primarily addressed in terms of identities and modes of belonging, rather than skills and information. Identity is connected to the activities on the learning trajectory as well as to the roles students play. Another aspect of identity is multiple memberships, involving reconciliation of boundaries and creation of bridges across the landscape of practice. Within communities, members can form groups, which also move through different trajectories of participation.

We adopt this perspective on learning for deriving a set of requirements for CVEs supporting social awareness in learning communities.

2. Requirements for Educational CVEs for Supporting Social Awareness

We suggest a characterization of CVEs inspired by activity theory along the dimensions of learner, place and artifacts. In educational CVEs we consider activities performed by learners who belong to various groups and communities. Activities are mediated by artifacts. Learners and artifacts are contained in space, which creates a context for social activities. Based on the understanding of learning communities, we present a list of requirements for supporting social awareness, along these three dimensions.

The learner. L1: The representation of each individual learner must evolve with and reflect the movements of the learner along the learning and participation trajectories as well as the learner identity. L2: The construction of identity and recognition of communicational patterns should be supported by providing necessary
communication and artifact manipulation facilities. **L3:** The embodiment of a learner must reflect her place on the learning trajectory, offer the possibilities to easy navigation through the community and permit emotional expressiveness. **L4:** The environment should make the learners aware of other learners and their mutual relations.

**The place.** **P1:** The place should provide a framework for the activities performed there and be structured, possibly hierarchically, to reflect the division of labor and resources and the structure of communities. **P2:** The structure must be dynamic, to reflect and facilitate the changing structures and trajectories of the communities and groups involved. **P3:** The outlook can be static, but it must reflect the spirit and identity of the communities and groups. **P4:** The environment should support a flexible usage of different parts of the place for playing different roles (meeting places, information spaces etc).

**The artifacts.** **A1:** The artifacts represent the cultural tools, facilitating mediating of communication, learning and task completion, and should comprise a shared repertoire for the community. **A2:** It must be possible to associate artifacts to people, to provide the awareness of their participation and learning trajectories. **A3:** It must be possible to leave traces of user action on the artifacts, reflecting the activities and resource ownerships.

3. Prototype

To investigate the feasibility of the requirements, we developed a virtual world, Viras, using the Active Worlds [1]. Viras is based on the metaphor of *archipelago*, with islands connected to other islands via teleportation links, bridges, and roads. Islands are populated by users and various types of artifacts. In Viras, users are represented by avatars, objects they create and the history of communications. Users leave their traces where they “live”, participate or just visit (L1). Users can communicate by text chat, messages, creating and changing artifacts and spatial constructions, making gestures, changing avatar position etc (L2). The user can navigate through the environment by walking, flying, or by following teleportation links left by others. The avatar is chosen from a predefined list, with a set of gestures attached (L3). The in-built list of users online, as well as avatars present, their position and mutual orientation, provide the awareness of other learners present (L4).

The outlook of Viras is chosen to be an archipelago in order to support an informal atmosphere (P3). An island defines clear territorial boundaries, but without the closeness of e.g. rooms and buildings. Also, islands connected to form an archipelago can serve as metaphor of the way communities and groups can be combined, reflecting the social structures and relations within them: for example, each person lives in a building or a part of it; each group owns one or more islands, forming an archipelago representing the community. All islands and buildings are hierarchically connected by teleportation links, roads or bridges (P1). Though the outlook is partly static (P3), the structure is fully dynamic, since users can freely modify all constructions that are public or their own property, such as rooms, houses, islands, bridges. A number of house and islands templates are provided for customization (P2). The environment can be used both for socializing and work. The main island provides users with a common meeting place, a transportation node and a collection of artifacts necessary for their activities (P4).

Such artifacts for different purposes are provided everywhere so the users can fill in their parameters, copy and create new ones, such as templates for message boards, document links, teleportation links, picture and text holders and examples of buildings (A1). The users can leave their traces by creating and changing their own artifacts with a name and time stamp on it, copying and destroying of public artifacts (A2). The users also may leave explicit information about themselves and their activities in the description fields of the artifacts or by attaching signs with comments to them (A2, A3).

4. Conclusions

Based on a social approach to learning, we presented requirements that CVEs must fulfill and we have briefly described a prototype addressing these requirements. After our experience with the design of Viras and its initial usage, we are fully aware that the realization of all the requirements in one virtual world is complex due to the limitations of the technology and the different scenarios of possible usage, imposing different demands on the system. However, we believe that Viras is a good starting point for exploring more in details social awareness support by the means of CVEs.

5. References