Team Awareness in Personalized Learning Environments
Overview

- Team Learning - Learning in Context
- Team Awareness
- Why use Context Information?
- Mobile Learning Context
- Architectural Overview
- Implementation
Types of Learning – Self Study

Teaching by Conservation
Learning by Acquiring

T (eacher)

A (rtefact)

L (earner)

Interaction
Types of Learning – Presentational

Teaching by Transmission
Learning by Reception

Interaction
Reflection
Types of Learning – Instructor Initiated

Teaching by Transmission
Learning by Sharing

Interaction
Reflection
Types of Learning – Collaborative Learning

Teaching by Discourse
Learning by Dialogue

M (ember)

Team Knowledge

G (roup)

M

Interaction

Reflection
Computer Mediated Learning

**Team Learning**
- ad-hoc interaction, group learning systems, awareness solutions

**Instructor Initiated Learning**
- synchronous learning, real time, moderation, selective interaction

**Self Study / Presentational**
- asynchronous learning, traditional learning processes with “new media”

**Mobile Team Learning Environment**
- e-mail, chat, forums, video conference

**Learning CD-ROMs, videos, e-books, WWW**
Support for Mobile Learning Teams

Interaction Systems

Mobility Systems

Awareness System

Organisational Innovation System

Information and Knowledge Management System
Team Awareness

Awareness is an understanding of the activities of others, which provides a context for your own activity. [Dour92]

Needs for Awareness in Team Learning Processes [Gutw95]:
- Social Awareness
- Task Awareness
- Concept Awareness
- Workspace Awareness

Main awareness deficiencies in today's virtual teams [Jang00]:
- Activities  What are the other's doing?
- Availability  Where and when can I reach the others?
- Process     Where we are in the project?
- Perspective  What are the others thinking and why?

To enable people to not only learn side by side but together, it is crucial to provide awareness not only about the other team members’ state but also about the team itself and the activities carried out in it’s context.
Learning in Context

Diagram showing the relationship between an e-learning system, context module, learner's context, and contextualized content.
What is Context?

Context is “*any information that can be used to characterize the situation of an entity. An entity is a person, place, or object that is considered relevant to the interaction between a user and an application, including the user and applications themselves.*” [Dey00]

Context can be classified in categories = **Context Dimensions**

- Location
- Identity
- Activity
- Time

secondary context types

aggregation
abstraction
additional knowledge

e.g. birth date
email address
nearby people
forecasted weather

primary context types
Mobile Learning Context

Learning Context is “any information that can be used to characterize the situation of learning entities that are considered relevant to the interactions between a learner and an application” [Wang04]

Dimensions:
- Identity
- Spatio-Temporal
- Facility
- Activity
- Learner
- Community
- Team-Awareness

single-user centered
focus on the team

Additional knowledge (gathered automatically or manually)
Learning in Context - revisited
Implementation

- Design-focus on
  - Modularity
  - Flexibility
  - Extensibility

  by using the SiLiCon Context Framework [Beer03]

- Main purpose: Supporting Interaction in Teams

- For that reason, only a subset of team awareness is supported at the moment
  - Workspace Awareness
  - Social Awareness

- More aspects of team awareness could be covered by simply adding further sources of context.

- User Interface is built upon an instant messenger, utilizing the features it provides (ICQ network).
Sources of Context & context-aware Services

- Sources of Context used to obtain the individual learner’s context:
  - Time: RTC of the user’s computer
  - Identity: ICQ account and contact list information
  - Activity: ICQ availability status
  - Location: not that simple ...

- Context-aware services using team-awareness provided at the moment:
  - Support for synchronous communication in teams
  - Support for asynchronous communication in teams
  - Team formation support
  - Team meeting support
  - Extended Awareness about the state of team members

- Several more tools not directly using team awareness:
  - Context-aware reminders
  - Context-aware availability management
  - Queries about team members’ activities in the past

...developed a technology independent positioning system (using RFID-, Bluetooth- and WLAN-sensors at the moment)
System in Action
Summary

- Context Information is crucial for the support of learning in teams.

- It is necessary not only to use the individual learners’ contexts but also team awareness information.

- The context of the team is more than the sum of individual contexts.

- Awareness systems should be built upon flexible and extensible frameworks, thus enabling an easy adaption to available context sources and the required form of presentation.

- The implemented system provides means for context-aware interaction support in teams and presentation of team awareness information, providing a starting point for a comprehensive team awareness support system.