



FernUniversität in Hagen

Real Virtual Erasmus (REVE)

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WP2: Services

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Distributed Systems



Overview

- Objectives
- Approach
- CURE





Objectives

Virtual mobility

- affects courses and course elements
 - can be a complement to physical mobility
 - as preparation or
 - follow-up of physical mobility
 - offers new learning opportunities
 - following elective courses in a foreign university
 - requires new learning approaches and technologies for collaborative learning
-



Objectives

Collaborative learning among distributed learners and teachers requires

- an e-learning infrastructure supporting the
 - set-up of collaborative learning
 - organisation of collaborative learning
 - execution of collaborative learning
 - services for
 - group formation
 - collaborative work (sharing and joint manipulation of artefacts, communication, coordination within learning groups)
 - collaborative learning (scaffolding, monitoring, feedback)
-



Objectives

Due to diverse mobility aspects the e-learning infrastructure has to

- support different modes of access such as
 - on-line
 - mobile
 - off-line
 - offer an interface for integrating the different administrative systems of the participating universities
-



Approach

First steps

1. Requirements analysis and pilot tests basing on real use cases
2. Based on these use cases develop
 - a CSCL platform
 - necessary administration services and
 - test the infrastructure in virtual mobility cases

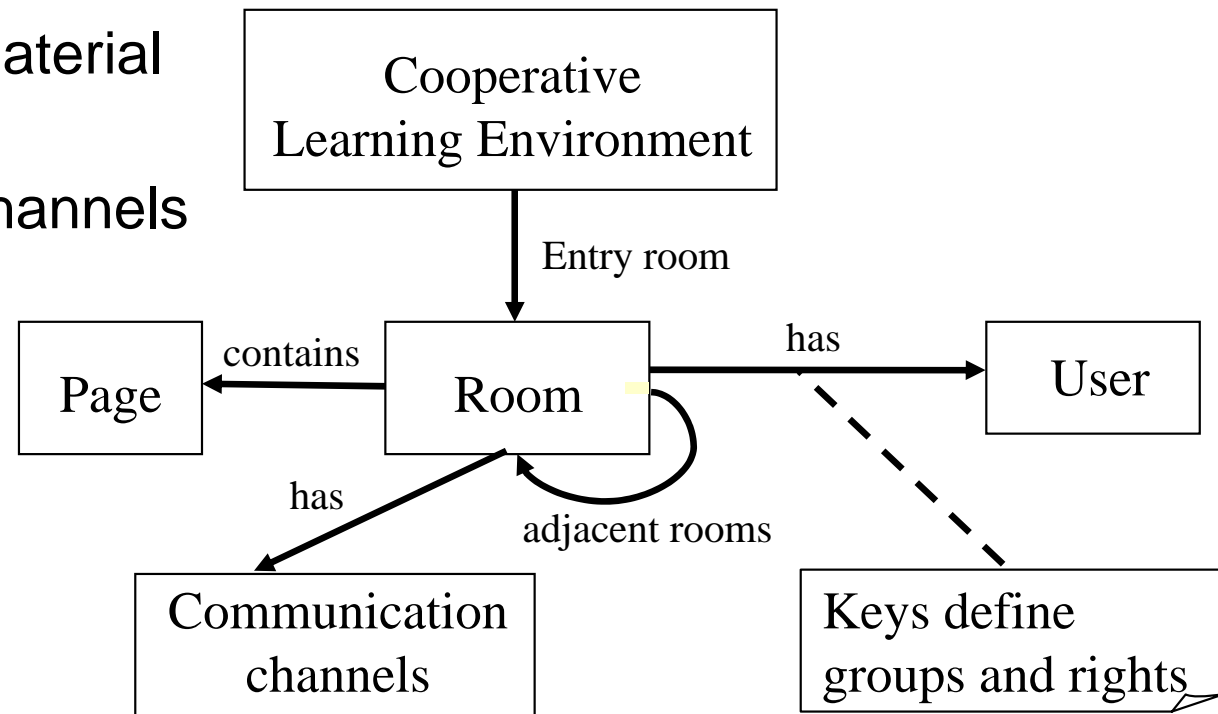
Example use case “*International SW development project in distributed systems*”:

- computer science students from different universities carry out a SW development project in teams over one semester
 - communication, coordination, and cooperation are carried out using our CSCL platform
-



CURE offers the following abstractions

- Room: shared workspace for group
- Group = { users with key to the same room }
- A rooms provides:
 - Pages: learning material & tools
 - Communication channels
 - Awareness
- Adjacent rooms form learning environment





CSCL platform CURE

<http://cure.pi6.fernuni-hagen.de>

CURE

- facilitates collaborative learning in distributed teams,
- can be accessed with a standard Web browser, and
- combines the room metaphor, WIKI ideas, and communication tools.

navigation mailbox uploads room interaction

Lineare Algebra: homePage - Microsoft Internet Explorer

Lineare Algebra: homePage

homePage

[Eingangshalle LA II] [Kurstext] [Cafe] [Betreuung] [Techniker]

Herzlich Willkommen zum

CSCL-Arbeitsbereich zur Linearen Algebra II

Dieser Raum und seine Unterräume dienen zur Diskussion und Gruppenarbeit zu den Kursen 1103 und 1105.

Hilfen und Hinweise

Neu: [Einsendeaufgaben](#)

Neu: [Über die AG-Räume](#)

Neu: [Tipps zum Arbeiten](#)

Neu: [Räume und Schlüssel](#)

Kursmaterial in der VU

[VU Eingangsseite](#) [Kurs 1103](#) [Kurs 1105](#)

Zuletzt bearbeitet von [Huyen Nguyen](#) (25.03.04, 11:55)

78 (04.05.08:23:49) [Luise Unger](#): Nummerierung notiert. Seite 12 wäre richtig gewesen.

79 (04.05.08:27:00) [Fabian Müller](#): Der Grad von r ist (Division mit Rest) immer echt kleiner als der Grad des Polynoms, durch das Sie teilen. Sie teilen aber durch ein Polynom vom Grad 1 (mit Rest). Also ist $\text{Grad}(r) < 1$. Ok, nochmal derselbe Beweis.

80 (04.05.08:27:02) [Fabian Müller](#): Warum ist $r(\lambda) = r\lambda^0$?

81 (04.05.08:28:43) [Luise Unger](#): r ist der konstante Faktor. Genauer, $r = rT^0$. Jetzt setzen Sie in T^0 ein, das gibt $r\lambda^0$.

send

CSCLPortal der FernUniversität in Hagen

Applet ChatApplet started



Managing Collaboration Spaces in CURE

- Create/manipulate rooms
 - Communication: chat, threaded mailbox
 - Cooperation: shared pages
 - Coordination
 - Change notifications
 - Shared plans (pages)
 - Calendar, meeting scheduler
 - Access management
-



Group Representation

Room properties







Eigenschaften des Raumes: No Complaint

[gehe zu]

D R E

Allgemeine Eigenschaften
Erzeugt am: 2003-10-25 14:40:12.907
Beschreibung:
Interaktives Spiel mit wundervollem Smalltalk!

Benutzer mit Schlüsseln für diesen Raum

Bourimi, Mohamed  	Khoudiakov, Pavel  
Laaks, Sven [no photo] 	Lukosch, Stephan  
Rückert, Kerstin [no photo] 	Schobert, Wolfram  
Schuhammer, Till  	Talbot, Mike [no photo] 
Voigt, Ingrid [no photo] 	

Vorhandene Seitenvorlagen
default 
Unnamed Template 

Fähigkeiten

<input checked="" type="checkbox"/> Öffentlich	<input checked="" type="checkbox"/> Gruppenbewusstsein
<input checked="" type="checkbox"/> Chat	<input checked="" type="checkbox"/> Kalender
<input checked="" type="checkbox"/> Briefkasten	<input checked="" type="checkbox"/> Mails an Benutzer schicken

[gehe zu]

Creation of Keys

Schlüssel kopieren

Legen Sie die Rechte für den neuen Schlüssel fest:

 Schlüsselrechte	<input checked="" type="radio"/> Keine Rechte	<input type="radio"/> Schlüssel zurückgeben	<input type="radio"/> Schlüssel vernichten	<input type="radio"/> Schlüssel weitergeben	<input type="radio"/> Schlüssel kopieren
 Raumrechte	<input type="radio"/> Keine Rechte	<input type="radio"/> Raum betreten	<input type="radio"/> Nachbarraum erzeugen	<input checked="" type="radio"/> Raumschloss austauschen	<input type="radio"/> Raum löschen
 Interaktionsrechte	<input type="radio"/> Keine Rechte	<input type="radio"/> Inhalte lesen	<input checked="" type="radio"/> Kommunizieren	<input type="radio"/> Anmerkungen verfassen	<input type="radio"/> Inhalte bearbeiten

Anzahl der zu erzeugenden Kopien:

Gültigkeitsbeginn:  Gültigkeitsende: 

Geben Sie an, was Sie mit den Schlüsselkopien machen möchten

Die Schlüssel als eigene Schlüssel behalten
 Die Schlüssel als freie Schlüssel im Raum plazieren
 Die Schlüssel an andere Benutzer weitergeben (Namen unten angeben)

Wählen Sie die gewünschten Benutzer (Mehrfachauswahl durch Strg-Klick)

Schorm, Petra
Schucht-Pump, Maja
Schüler, Rainer
Schummer, Jan
Schuhammer, Till
Schuette, Sylvia
Schulte, Berthold
Schulz, Alexander
Schulz, Gerald
Schumacher, Stefan

Sie können hier eine Bemerkung für den Schlüsselempfänger hinzufügen:



Group formation in CURE

Schlüssel kopieren

Legen Sie die Rechte für den neuen Schlüssel fest:

	Schlüsselrechte	<input checked="" type="radio"/> Keine Rechte	<input type="radio"/> Schlüssel zurückgeben	<input type="radio"/> Schlüssel vernichten	<input type="radio"/> Schlüssel weitergeben	<input type="radio"/> Schlüssel kopieren
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	Interaktionsrechte	<input type="radio"/> Keine Rechte	<input type="radio"/> Inhalte lesen	<input type="radio"/> Kommunizieren	<input type="radio"/> Anmerkungen verfassen	<input type="radio"/> Inhalte bearbeiten

Anzahl der zu erzeugenden Kopien:

Gültigkeitsbeginn: 18.05.2004 Gültigkeitsende: 20.03.2005

Geben Sie an, was Sie mit den Schlüsselkopien machen möchten

Die Schlüssel als eigene Schlüssel behalten
 Die Schlüssel als freie Schlüssel im Raum platzieren
 Die Schlüssel an andere Benutzer weitergeben (Namen unten angeben)

Wählen Sie die gewünschten Benutzer (Mehrfachauswahl durch Strg-Klick)

- Schorm, Petra
- Schuchit-Rumpf
- Schüler, Reine
- Schümmer, Je
- Schümmer, Je
- Schuetz, Syl
- Schulte, Berth
- Schulz, Alexan
- Schulz, Gerald
- Schumacher, S

Sie können

- Fachpraktikum CSCW - Entwicklung von Learning Gadgets WS 20
 - Fachpraktikum CSCW: Kooperative Spiele
 - Ameisenvolk
 - Geheimkammer
 - Hemisphere
 - Labyrinth
 - Kundenbetreuung
 - Leitung
 - Multiplayer-Pacman
 - No Complaint
 - Smalltalk Café
 - Spionage
 - Seminar 1914 Meilensteine der Informatik
 - Algorithmus
 - Automaten

Spectrum of group formation:

- Assignment
- Invitation
- Free enrollment
- Confirmed enrollment
- Public spaces



Experiences

Project-based course on “Synchronous cooperative systems”

- Winter term 2003/04
 - 36 students, 6 groups à 6 students
 - Task: development of a cooperative game
 - SW development environment: Eclipse/Java, Smalltalk
 - Blended learning
 - Group formation
 - Each group created a group sub room in the shared workspace accessible only to group members and two teachers
-



Experiences (2)

- Use of shared rooms
 - Two groups created a private room
 - Teachers created publicly available rooms for discussing technology related issues; these were rarely used
 - Use of shared documents
 - Before the first meeting, students created game ideas on pages
 - During project work, all groups used
 - Attachments to share documents
 - Pages to jointly write development documents
-



Experiences (3)

- Use of communication
 - During distributed work, groups used mainly the threaded mailbox
 - Two groups used chat
 - Several (sub)groups had regular phone conferences
 - Structuring the group process
 - All groups created work plans in CURE
 - One group created a special template for planning card pages to support XP
 - Two groups created sub rooms
 - Student & Teacher feedback
 - Very positive
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Group projects in SWE education

- SWE is a collaborative practice
 - SW project often fail due to social/communication problems
 - Students need collaboration skills
 - Group projects as a teaching method
 - Complexity requires non-trivial long-term collaboration: 1-2 semesters
 - Methodological skills (SWE)
 - Collaboration skills
-



Social aspects of distributed group projects

- Lack of collaboration skills for distributed settings
 - Students and teachers are geographically distributed
 - Few f-t-f meetings possible,
 - Synchronous interaction limited,
 - Mainly computer-mediated interaction,
 - Coordination and cooperation more difficult
 - Students and teachers don't know each other
 - Trust building, commitment
 - Social interaction
- => approach: blended group projects
-



Requirements on support for blended group projects

- Group building
 - Introduction of participants,
 - Social encounters, trust building,
 - Group formation
 - Sharing of artefacts
 - E.g. documentation, work plan, code
 - Joint editing
 - Openness
 - Group work process: dependent on method, group
 - Group product: dependent on SWE environment
 - Synchronous & asynchronous communication in plenary and groups
 - Interaction among all participants
 - Monitoring
 - Progress/changes within group (coordination)
 - Group behaviour, results (facilitation)
 - Feedback from facilitators to groups
 - Tailoring of group work process and collaboration environment
-



Organisation of group projects

	Mode	Activity	Main actors
Administration	distributed	announcement	teachers
		enrollment	students
		selection	teachers
Group building	F-t-f	Project idea generation & discussion	students
		Project idea selection	Students/teachers
Group work	F-t-f	Group formation	students
		Introduction of methodology	teachers
		Creation of workplan	students
		Assignment of roles	students
		Monitoring of workplan and roles	teachers
		distributed	distributed
Monitoring of group behavior, results	teachers		
Group evaluation	F-t-f	Presentation of results	students
	distributed	Assignment of final changes	teachers
		Delivery of final results	students
		Grading	teachers

feedback



Scaffolding in CURE

Scaffolding: guiding the learning process

- Organizing learning activities through rooms and pages
 - Explicit instructions, milestones
 - Organization
 - Predefined (teacher)
 - Self-organized
-



Supporting distributed group projects in CURE

	activity	actors	Supported by
Administration	announcement	teachers	WWW; create CURE room structure
	enrollment	students	E-mail
	selection	teachers	Assign keys for rooms to students
Group building	Project idea generation & discussion	students	Pages in Ideas room
	Project idea selection	Stud./teach.	F-t-f discussion, CURE
	Group formation	students	F-t-f clustering, CURE
Group work	Introduction of methodology	teachers	F-t-f presentations, CURE
	Creation of workplan	students	F-t-f meeting, CURE
	Assignment of roles	students	F-t-f meeting, CURE
	Monitoring of workplan and roles	teachers	F-t-f feedback
	Group work (delivery of milestones)	students	Rooms, pages, attachments, chat, mailbox, SWE env.
Group evaluation	Monitoring of group behavior, results	teachers	Logs, change notifications; mailbox
	Presentation of results	students	F-t-f presentation, PPT
	Assignment of final changes	teachers	mailbox
	Delivery of final results	students	Rooms, pages, attachments
	Grading	teachers	Rooms, pages, attachments, logs



Conclusions

- CURE provides support for organising and performing group projects
- Appropriate scaffolding in terms of method, milestones and facilitation seems crucial
- Open issues include
 - Better integration with SW development environment

Test it at <http://cure.pi6.fernuni-hagen.de>



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***Supporting Blended Group Projects
in CURE***

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