

*Commenced Publication in 1973*

Founding and Former Series Editors:

Gerhard Goos, Juris Hartmanis, and Jan van Leeuwen

## Editorial Board

David Hutchison

*Lancaster University, UK*

Takeo Kanade

*Carnegie Mellon University, Pittsburgh, PA, USA*

Josef Kittler

*University of Surrey, Guildford, UK*

Jon M. Kleinberg

*Cornell University, Ithaca, NY, USA*

Alfred Kobsa

*University of California, Irvine, CA, USA*

Friedemann Mattern

*ETH Zurich, Switzerland*

John C. Mitchell

*Stanford University, CA, USA*

Moni Naor

*Weizmann Institute of Science, Rehovot, Israel*

Oscar Nierstrasz

*University of Bern, Switzerland*

C. Pandu Rangan

*Indian Institute of Technology, Madras, India*

Bernhard Steffen

*University of Dortmund, Germany*

Madhu Sudan

*Microsoft Research, Cambridge, MA, USA*

Demetri Terzopoulos

*University of California, Los Angeles, CA, USA*

Doug Tygar

*University of California, Berkeley, CA, USA*

Gerhard Weikum

*Max-Planck Institute of Computer Science, Saarbruecken, Germany*

Ulrike Cress Vania Dimitrova  
Marcus Specht (Eds.)

# Learning in the Synergy of Multiple Disciplines

4th European Conference  
on Technology Enhanced Learning, EC-TEL 2009  
Nice, France, September 29–October 2, 2009  
Proceedings



Springer

**Volume Editors**

**Ulrike Cress**

Knowledge Media Research Center (KMRC)  
Konrad-Adenauer-Str. 40, 72072 Tübingen, Germany  
E-mail: u.cress@iwm-kmrc.de

**Vania Dimitrova**

University of Leeds  
School of Computing  
Knowledge Representation and Reasoning Research Group  
E.C. Stoner Building, Leeds LS2 9JT, UK  
E-mail: vania@comp.leeds.ac.uk

**Marcus Specht**

Open University of the Netherlands  
Centre for Learning Sciences and Technologies (CELSTEC)  
Valkenburgerweg 177, 6419 AT Heerlen, The Netherlands  
E-mail: marcus.specht@ou.nl

Library of Congress Control Number: 2009934787

CR Subject Classification (1998): I.2.6, K.3.2, H.5.3, J.1, J.5, K.4

LNCS Sublibrary: SL 2 – Programming and Software Engineering

ISSN 0302-9743

ISBN-10 3-642-04635-5 Springer Berlin Heidelberg New York

ISBN-13 978-3-642-04635-3 Springer Berlin Heidelberg New York

This work is subject to copyright. All rights are reserved, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, re-use of illustrations, recitation, broadcasting, reproduction on microfilms or in any other way, and storage in data banks. Duplication of this publication or parts thereof is permitted only under the provisions of the German Copyright Law of September 9, 1965, in its current version, and permission for use must always be obtained from Springer. Violations are liable to prosecution under the German Copyright Law.

[springer.com](http://springer.com)

© Springer-Verlag Berlin Heidelberg 2009  
Printed in Germany

Typesetting: Camera-ready by author, data conversion by Scientific Publishing Services, Chennai, India  
Printed on acid-free paper SPIN: 12766000 06/3180 5 4 3 2 1 0

# Preface

This conference on technology enhanced learning is the fourth event in a series that started in 2006. It was held from September 29th to October 2nd, 2009 in Nice (France). The EC-TEL conference series provides a forum for presenting and promoting high-quality research in the area of technology enhanced learning.

The EC-TEL conference was originally launched by the European network of excellence ProLearn and attracted many people from both the ProLearn and Kaleidoscope networks of excellence. In 2009, a new European network, STELLAR, was launched, which continues the work and success of the former networks and takes a broader multi-disciplinary perspective. A key issue is making the research communities aware of the different projects and activities within Europe and beyond. The aim is to build an integrated research arena in which groups with different backgrounds can build on each other and where the synergy between multiple research approaches and disciplines is fostered.

The face of learning is changing substantially. As a result, the topic of technology enhanced learning has to take a broader interdisciplinary perspective. Formal learning is surrounded by a variety of opportunities for informal learning, classroom learning is complemented by workplace learning, and even the frontiers between teaching and learning are disappearing. People are learning collaboratively, they engage in knowledge communities and change from knowledge recipients to knowledge producers. These developments are driven by new technologies: large scale knowledge repositories provide learners with content and support them in an individualized and adaptive way; semantic technologies provide contextualized and task-specific information; the Web 2.0 enables people to participate actively in knowledge communication and knowledge construction, mobile and ubiquitous computing technologies enable the integration of informal and formal learning support. These new tools and technical means call for psychological and educational models of learning, which will have to take into account the vast diversity of situations in which learning takes place today, as well as the specific needs of individuals, tutors and organisations.

The papers submitted to this conference reflect this broad range of topics. A total of 25% of all submissions used the keyword “user-adaptive systems and personalisation”, which has been a typical topic of advanced learning environments for many years. The keywords “learning communities and communities of practice” and “collaborative knowledge building” were used by 23% of the submissions. These topics indicate a new perspective on learning and a drift from formal to more informal and natural learning. This tendency is also evident in the strong presence of the keywords “informal learning”, “learner motivation and engagement”, “problem and project-based learning”, “distance learning”, “knowledge management and organisational learning”, and “instruction design”.

One fifth of the submissions exploited the newly emerging technological directions of “semantic web and Web 2.0”.

The EC-TEL 2009 was truly international and highly competitive. Overall, 136 paper submissions and 22 poster submissions from 469 authors in 43 countries were received. The majority of submissions came from European countries (29 countries), but authors also came from 8 Asian and 4 American countries, as well as one African country. One submission was received from Australia. Program Committee members, coming from 19 countries, represented a broad spectrum of disciplines connected to technology enhanced learning. A rigorous review process was conducted where each submission was reviewed by at least three reviewers.

Out of all submissions, 35 were accepted as full papers (22%), 17 as short papers and a further 35 as posters. In the proceedings, the full papers are allowed up to 15 pages and the short papers and posters up to 6 pages. The conference programme included three keynote speakers who gave an idea of the wide range of technology enhanced learning. Short abstracts of the keynote talks are included in the proceedings.

The contributions presented in this volume show the colourfulness of research in technology enhanced learning. They describe technical innovations, demonstrate creative educational settings, invent exciting research questions and show successful implementations. We are confident that this spectrum of research will promote creativity and synergy.

A conference of this size would not have been possible without the invaluable help of the organising committee: the workshop chairs Nikol Rummel and Peter Dolog, the doctoral consortium chairs Frank Fischer and Stefanie Lindstaedt, the demonstration chairs Alexandra Cristea and Nikos Karacapilidis, and the industrial session chair Volker Zimmermann. Special thanks go to the head of the local organizing team Katherine Maillet, as well as the publicity chairs Marcela Morales and Mohamed Amine Chatti.

The EC-TEL 2009 conference promises to be a stimulating research event, presenting state-of-the-art projects and shaping the future of technology enhanced research in Europe and beyond.

September 2009

Ulrike Cress  
Vania Dimitrova  
Marcus Specht

## Conference Organisation

## General Chair

## Programme Chairs

## **Local Organisation Chair**

Katherine Maillet Institut Télécom, Telecom & Management SudParis, France

## Doctoral Consortium Chairs

Frank Fischer LMU University of Munich, Germany  
Stefanie Lindstaedt Know Center, Austria

## Workshop Chairs

## Demonstration Chairs

Alexandra Cristea  
Nikos Karacapilidis

# Industrial Session Chair

Volker Zimmermann IMC, Germany

## Publicity Chairs

Marcela Morales Institut Télécom, Telecom & Management SudParis, France  
Mohamed Amine Chatti RWTH Aachen University, Germany

## Programme Committee

- Heidrun Allert , Austria  
Katrín Allmendinger, Germany  
Inmaculada Arnedillo-Sánchez, Ireland  
Nicolas Balacheff, France  
Maria Bieliková, Slovakia  
Zuzana Bizonová , Slovakia  
Bert Bredeweg, The Netherlands  
Peter Brusilovsky, USA  
Daniel Burgos, Spain  
Manuel Caeiro, France  
Lorenzo Cantoni, Switzerland  
Alexandra Cristea, UK  
Valentin Cristea, Romania  
Paul de Bra, The Netherlands  
Carlos Delgado Kloos, Spain  
Elisabeth Delozanne, France  
Pierre Dillenbroug, Switzerland  
Yannis Dimitriadis, Spain  
Peter Dolog, Denmark  
Benedict du Boulay, UK  
Eric Duval, Belgium  
Dieter Euler, Switzerland  
Christine Ferraris, France  
Adina Magda Florea, Romania  
Dragan Gasevic, Canada  
Andreas Gegenfurtner, Finland  
Denis Gillet, Switzerland  
Monique Grandbastien, France  
Jorg Haake, Germany  
Paivi Hakkinen, Finland  
Peng Han, Germany  
Andreas Harrer, Germany  
Christoph Held, Germany  
Marek Hatala, Canada  
Eelco Herder, Germany  
Knut Hinkelmann, Switzerland  
Ulrich Hoppe, Germany  
Patrick Jermann, Switzerland  
Nikos Karacapilidis, Greece  
Michael D. Kickmeier-Rust, Austria  
Barbara Kieslinger, Austria  
David Kirsh, USA  
Ralf Klamma, Germany  
Tomaz Klobucar, Slovenia  
Rob Koper, The Netherlands  
Nicole Kraemer, Germany  
Milos Kravcik, The Netherlands  
Effie Law, Switzerland  
Lydia Lau, UK  
Martin Lea, UK  
Stefanie Lindstaedt, Austria  
Andreas Lingnau, Germany  
Chee-Kit Looi, Singapore  
Rose Luckin, UK  
George Magoulas, UK  
Katherine Maillet, France  
Alejandra Martínez, Spain  
Vittorio Midoro, Italy  
Tanja Mitrovic, New Zealand  
Riichiro Mizoguchi, Japan  
Paola Monachesi, The Netherlands  
Wolfgang Nejdls, Germany  
Roger Nkambou, Canada  
Lucia Pannese, Italy  
Jan Pawłowski, Finland  
Juan Quemada, Spain  
Christoph Richter, Austria  
Uwe Riss, Germany  
Nikol Rummel, Germany  
Maggi Savin-Baden, UK  
Tammy Schellens, Belgium  
Daniel Schneider, Switzerland  
Judith Schoonenboom,  
The Netherlands  
Peter Scott, UK  
Evgenia Sendova, Bulgaria  
Mike Sharples, UK  
Kiril Simov, Bulgaria  
Peter Sloep, The Netherlands  
Pierre Tchounikine, France  
Stefan Trausan-Matu, Romania  
Julita Vassileva, Canada  
Vincent Wade, Ireland  
Armin Weinberger, The Netherlands  
Katrín Wodzicki, Germany  
Martin Wolpers, Belgium  
Volker Zimmermann, Germany

## Additional Reviewers

Stamatina Anastopoulou  
Benjamin Huynh Kim Bang  
Michal Barla  
Scott Bateman  
Elizabeth Brown  
Roman Brun  
Wenli Chen  
Manuela Delfino  
Hendrik Drachsler  
María Blanca Ibáñez Espiga  
Raquel M. Crespo García  
George Gkotsis  
Israel Gutierrez  
Zoe Handley  
Yusuke Hayashi  
I-Han Hsiao  
Eva Hudlicka  
Raija Hämäläinen  
Nikos Karousos  
Sebastian Kelle  
Tom Kirkham  
Stylianis Kleanthous  
Kouji Kozaki  
Barbara Kump  
Danielle H. Lee  
Vignollet Laurence  
Derick Leony  
Sarah Lewthwaite  
Tobias Ley  
David Maroto  
Sze Ho David Moh  
Vlad Posea  
Francesca Pozzi  
Andreas S. Rath  
Traian Rebedea  
Riad Saba  
Olga C. Santos  
Hans-Christian Schmitz  
Stefano Tardini  
Jozef Tvarozek  
Manolis Tzagarakis  
Elizabeth Uruchurtu  
Luis de la Fuente Valentín  
Dominique Verpoorten  
Juan Quemada Vives  
Michael Yudelson  
Sam Zeini  
Sabrina Ziebarth

# Table of Contents

## Keynotes

Making Sense of Sensemaking in the Digital World . . . . .	1
<i>Peter Pirolli</i>	
Towards an Interdisciplinary Design Science of Learning . . . . .	3
<i>Mike Sharples</i>	
Use and Acquisition of Externalized Knowledge . . . . .	5
<i>Friedrich W. Hesse</i>	

## Adaptation and Personalisation

LAG 2.0: Refining a Reusable Adaptation Language and Improving on Its Authoring . . . . .	7
<i>Alexandra I. Cristea, David Smits, Jon Bevan, and Maurice Hendrix</i>	
The Conceptual and Architectural Design of a System Supporting Exploratory Learning of Mathematics Generalisation . . . . .	22
<i>Darren Pearce and Alexandra Poulovassilis</i>	
Experience Structuring Factors Affecting Learning in Family Visits to Museums . . . . .	37
<i>Marek Hatala, Karen Tanenbaum, Ron Wakkary, Kevin Muise, Bardia Mohabbati, Greg Corness, Jim Budd, and Tom Loughin</i>	
Personalisation of Learning in Virtual Learning Environments . . . . .	52
<i>Dominique Verpoorten, Christian Glahn, Milos Kravcik, Stefaan Ternier, and Marcus Specht</i>	
A New Framework for Dynamic Adaptations and Actions . . . . .	67
<i>Carsten Ullrich, Tianxiang Lu, and Erica Melis</i>	
Getting to Know Your User – Unobtrusive User Model Maintenance within Work-Integrated Learning Environments . . . . .	73
<i>Stefanie N. Lindstaedt, Günter Beham, Barbara Kump, and Tobias Ley</i>	
Adaptive Navigation Support for Parameterized Questions in Object-Oriented Programming . . . . .	88
<i>I-Han Hsiao, Sergey Sosnovsky, and Peter Brusilovsky</i>	
Automated Educational Course Metadata Generation Based on Semantics Discovery . . . . .	99
<i>Marián Šimko and Mária Bieliková</i>	

Searching for “People Like Me” in a Lifelong Learning System .....	106
<i>Nicolas Van Labeke, George D. Magoulas, and Alexandra Poulovassilis</i>	

## Interoperability, Semantic Web, Web 2.0

Metadata in Architecture Education - First Evaluation Results of the MACE System .....	112
<i>Martin Wolpers, Martin Memmel, and Alberto Giretti</i>	

Phantom Tasks and Invisible Rubric: The Challenges of Remixing Learning Objects in the Wild .....	127
<i>David E. Millard, Yvonne Howard, Patrick McSweeney, Miguel Arrebolá, Kate Borthwick, and Stavroula Varella</i>	

Can Educators Develop Ontologies Using Ontology Extraction Tools: An End-User Study .....	140
<i>Marek Hatala, Dragan Gašević, Melody Siadaty, Jelena Jovanović, and Carlo Torniai</i>	

Sharing Distributed Resources in LearnWeb2.0 .....	154
<i>Fabian Abel, Ivana Marenzi, Wolfgang Nejdl, and Sergej Zerr</i>	

SWeMoF: A Semantic Framework to Discover Patterns in Learning Networks .....	160
<i>Marco Kalz, Niels Beekman, Anton Karsten, Diederik Oudshoorn, Peter Van Rosmalen, Jan Van Bruggen, and Rob Koper</i>	

## Data Mining and Social Networks

Social Network Analysis of 45,000 Schools: A Case Study of Technology Enhanced Learning in Europe .....	166
<i>Ruth Breuer, Ralf Klamma, Yiwei Cao, and Riina Vuorikari</i>	

Analysis of Weblog-Based Facilitation of a Fully Online Cross-Cultural Collaborative Learning Course .....	181
<i>Anh Vu Nguyen-Ngoc and Effie Lai-Chong Law</i>	

Sharing Corpora and Tools to Improve Interaction Analysis .....	196
<i>Christophe Reffay and Marie-Laure Betbeder</i>	

## Collaboration and Social Knowledge Construction

Distributed Awareness for Class Orchestration .....	211
<i>Hamed S. Alavi, Pierre Dillenbourg, and Frederic Kaplan</i>	

Remote Hands-On Experience: Distributed Collaboration with Augmented Reality .....	226
<i>Matthias Krauß, Kai Riege, Marcus Winter, and Lyn Pemberton</i>	
A Comparison of Paper-Based and Online Annotations in the Workplace .....	240
<i>Ricardo Kawase, Eelco Herder, and Wolfgang Nejdl</i>	
Learning by Foraging: The Impact of Social Tags on Knowledge Acquisition .....	254
<i>Christoph Held and Ulrike Cress</i>	
Assessing Collaboration Quality in Synchronous CSCL Problem-Solving Activities: Adaptation and Empirical Evaluation of a Rating Scheme ...	267
<i>Georgios Kahrimanis, Anne Meier, Irene-Angelica Chouanta, Eleni Voyatzaki, Hans Spada, Nikol Rummel, and Nikolaos Avouris</i>	
<b>Learning Communities and Communities of Practice</b>	
Facilitate On-Line Teacher Know-How Transfer Using Knowledge Capitalization and Case Based Reasoning .....	273
<i>Celine Quenu-Joiron and Thierry Condamines</i>	
Edushare, a Step beyond Learning Platforms .....	283
<i>Romain Sauvain and Nicolas Szilas</i>	
Design in Use of Services and Scenarios to Support Learning in Communities of Practice .....	298
<i>Bernadette Charlier and Amaury Daele</i>	
Creating an Innovative Palette of Services for Communities of Practice with Participatory Design: Outcomes of the European Project PALETTE .....	304
<i>Liliane Esnault, Amaury Daele, Romain Zeiliger, and Bernadette Charlier</i>	
<b>Learning Contexts</b>	
NetLearn: Social Network Analysis and Visualizations for Learning .....	310
<i>Mohamed Amine Chatti, Matthias Jarke, Theresia Devi Indriasari, and Marcus Specht</i>	
Bridging Formal and Informal Learning – A Case Study on Students' Perceptions of the Use of Social Networking Tools .....	325
<i>Margarida Lucas and António Moreira</i>	
How to Get Proper Profiles? A Psychological Perspective on Social Networking Sites .....	338
<i>Katrin Wodzicki, Eva Schwämmlein, and Ulrike Cress</i>	

Collaborative Learning in Virtual Classroom Scenarios . . . . .	344
<i>Katrin Allmendinger, Fabian Kempf, and Karin Hamann</i>	
Review of Learning in Online Networks and Communities . . . . .	350
<i>Kirsti Ala-Mutka, Yves Punie, and Anusca Ferrari</i>	
Self-profiling of Competences for the Digital Media Industry: An Exploratory Study . . . . .	365
<i>Svenja Schröder, Sabrina Ziebarth, Nils Malzahn, and H. Ulrich Hoppe</i>	
PPdesigner: An Editor for Pedagogical Procedures . . . . .	379
<i>Christian Martel, Laurence Vignollet, Christine Ferraris, Emmanuelle Villiot-Leclercq, and Salim Ouari</i>	
Ontology Enrichment with Social Tags for eLearning . . . . .	385
<i>Paola Monachesi, Thomas Markus, and Eelco Mossel</i>	
<b>Problem and Project-Based Learning, Inquiry Learning</b>	
How Much Assistance Is Helpful to Students in Discovery Learning? . . . . .	391
<i>Alexander Borek, Bruce M. McLaren, Michael Karabinos, and David Yaron</i>	
A Fruitful Meeting of a Pedagogical Method and a Collaborative Platform . . . . .	405
<i>Bénédicte Talon, Dominique Leclet, Grégory Bourguin, and Arnaud Lewandowski</i>	
A Model of Retrospective Reflection in Project Based Learning Utilizing Historical Data in Collaborative Tools . . . . .	418
<i>Birgit R. Krogstie</i>	
Fortress or Demi-Paradise? Implementing and Evaluating Problem-Based Learning in an Immersive World . . . . .	433
<i>Maggi Savin-Baden</i>	
Project-Based Collaborative Learning Environment with Context-Aware Educational Services . . . . .	441
<i>Zoran Jeremić, Jelena Jovanović, Dragan Gašević, and Marek Hatala</i>	
<b>Learning Design</b>	
Constructing and Evaluating a Description Template for Teaching Methods . . . . .	447
<i>Michael Derntl, Susanne Neumann, and Petra Oberhuemer</i>	

Model and Tool to Clarify Intentions and Strategies in Learning Scenarios Design .....	462
<i>Valérie Emin, Jean-Philippe Pernin, and Viviane Guéraud</i>	
Users in the Driver's Seat: A New Approach to Classifying Teaching Methods in a University Repository .....	477
<i>Susanne Neumann, Petra Oberhuemer, and Rob Koper</i>	
<b>Motivation, Engagement, Learning Games</b>	
Generating Educational Interactive Stories in Computer Role-Playing Games .....	492
<i>Marko Divéky and Mária Bieliková</i>	
CAMera for PLE .....	507
<i>Hans-Christian Schmitz, Maren Scheffel, Martin Friedrich, Marco Jahn, Katja Niemann, and Martin Wolpers</i>	
Implementation and Evaluation of a Tool for Setting Goals in Self-regulated Learning with Web Resources .....	521
<i>Philipp Scholl, Bastian F. Benz, Doreen Böhnstedt, Christoph Rensing, Bernhard Schmitz, and Ralf Steinmetz</i>	
The Impact of Prompting in Technology-Enhanced Learning as Moderated by Students' Motivation and Metacognitive Skills .....	535
<i>Pantelis M. Papadopoulos, Stavros N. Demetriadis, and Ioannis G. Stamelos</i>	
Creating a Natural Environment for Synergy of Disciplines .....	549
<i>Evgenia Sendova, Pavel Boytchev, Eliza Stefanova, Nikolina Nikolova, and Eugenia Kovatcheva</i>	
<b>Human Factors and Evaluation</b>	
Informing the Design of Intelligent Support for ELE by Communication Capacity Tapering .....	556
<i>Manolis Mavrikis and Sergio Gutierrez-Santos</i>	
Automatic Analysis Assistant for Studies of Computer-Supported Human Interactions .....	572
<i>Christophe Courtin and Stéphane Talbot</i>	
Real Walking in Virtual Learning Environments: Beyond the Advantage of Naturalness .....	584
<i>Matthias Heintz</i>	
Guiding Learners in Learning Management Systems through Recommendations .....	596
<i>Olga C. Santos and Jesus G. Boticario</i>	

Supervising Distant Simulation-Based Practical Work: Environment and Experimentation .....	602
<i>Viviane Guéraud, Anne Lejeune, Jean-Michel Adam, Michel Dubois, and Nadine Mandran</i>	
<b>Posters</b>	
Designing Failure to Encourage Success: Productive Failure in a Multi-user Virtual Environment to Solve Complex Problems .....	609
<i>Shannon Kennedy-Clark</i>	
Revisions of the Split-Attention Effect .....	615
<i>Athanasios Mazarakis</i>	
Grid Service-Based Benchmarking Tool for Computer Architecture Courses .....	621
<i>Carlos Alario-Hoyos, Eduardo Gómez-Sánchez, Miguel L. Bote-Lorenzo, Guillermo Vega-Gorgojo, and Juan I. Asensio-Pérez</i>	
Supporting Virtual Reality in an Adaptive Web-Based Learning Environment .....	627
<i>Olga De Troyer, Frederic Kleinermann, Bram Pellens, and Ahmed Ewais</i>	
A Model to Manage Learner's Motivation: A Use-Case for an Academic Schooling Intelligent Assistant .....	633
<i>Tri Duc Tran, Christophe Marsala, Bernadette Bouchon-Meunier, and Georges-Marie Putois</i>	
Supporting the Learning Dimension of Knowledge Work .....	639
<i>Stefanie N. Lindstaedt, Mario Aehnelt, and Robert de Hoog</i>	
User-Adaptive Recommendation Techniques in Repositories of Learning Objects: Combining Long-Term and Short-Term Learning Goals .....	645
<i>Almudena Ruiz-Iniesta, Guillermo Jiménez-Díaz, and Mercedes Gómez-Albarrán</i>	
Great Is the Enemy of Good: Is Perfecting Specific Courses Harmful to Global Curricula Performances? .....	651
<i>Maura Cerioli and Marina Ribaudo</i>	
Evolution of Professional Ethics Courses from Web Supported Learning towards E-Learning 2.0 .....	657
<i>Katerina Zdravkova, Mirjana Ivanović, and Zoran Putnik</i>	
Towards an Ontology for Supporting Communities of Practice of E-Learning “CoPEs”: A Conceptual Model .....	664
<i>Lamia Berkani and Azeddine Chikh</i>	

Using Collaborative Techniques in Virtual Learning Communities .....	670
<i>Francesca Pozzi</i>	
Capturing Individual and Institutional Change: Exploring Horizontal versus Vertical Transitions in Technology-Rich Environments .....	676
<i>Andreas Gegenfurtner, Markus Nivala, Roger Säljö, and     Erno Lehtinen</i>	
A Platform Based on Semantic Web and Web2.0 as Organizational Learning Support .....	682
<i>Adeline Leblanc and Marie-Hélène Abel</i>	
Erroneous Examples: A Preliminary Investigation into Learning Benefits .....	688
<i>Dimitra Tsvaltzi, Erica Melis, Bruce M. McLaren, Michael Dietrich,     Georgi Goguadze, and Ann-Kristin Meyer</i>	
Towards a Theory of Socio-technical Interactions .....	694
<i>Ravi K. Vatrapu</i>	
Knowledge Maturing in the Semantic MediaWiki: A Design Study in Career Guidance .....	700
<i>Nicolas Weber, Karin Schoefegger, Jenny Bimrose, Tobias Ley,     Stefanie Lindstaedt, Alan Brown, and Sally-Anne Barnes</i>	
Internet Self-efficacy and Behavior in Integrating the Internet into Instruction: A Study of Vocational High School Teachers in Taiwan .....	706
<i>Hsiu-Ling Chen</i>	
Computer-Supported WebQuests .....	712
<i>Furio Belgiorno, Delfina Malandrino, Ilaria Manno,     Giuseppina Palmieri, and Vittorio Scarano</i>	
A 3D History Class: A New Perspective for the Use of Computer Based Technology in History Classes .....	719
<i>Claudio Tosatto and Marco Gribaudo</i>	
Language-Driven, Technology-Enhanced Instructional Systems Design .....	725
<i>Iván Martínez-Ortiz, José-Luis Sierra, and     Baltasar Fernández-Manjón</i>	
The Influence of Coalition Formation on Idea Selection in Dispersed Teams: A Game Theoretic Approach .....	732
<i>Rory L.L. Sie, Marlies Bitter-Rijpkema, and Peter B. Sloep</i>	
How to Support the Specification of Observation Needs by Instructional Designers: A Learning-Scenario-Centered Approach .....	738
<i>Boubekeur Zendagui</i>	

## XVIII Table of Contents

Using Third Party Services to Adapt Learning Material: A Case Study with Google Forms .....	744
<i>Luis de la Fuente Valentín, Abelardo Pardo, and Carlos Delgado Kloos</i>	
Virtual Worlds for Organization Learning and Communities of Practice .....	751
<i>C. Candace Chou</i>	
A Methodology and Framework for the Semi-automatic Assembly of Learning Objects .....	757
<i>Katrien Verbert, David Wiley, and Erik Duval</i>	
Search and Composition of Learning Objects in a Visual Environment .....	763
<i>Amel Bouzeghoub, Marie Buffat, Alda Lopes Gançarski, Claire Lecocq, Abir Benjema, Mouna Selmi, and Katherine Maillet</i>	
A Framework to Author Educational Interactions for Geographical Web Applications .....	769
<i>The Nhan Luong, Thierry Nodenot, Philippe Lopistéguy, and Christophe Marquesuàà</i>	
Temporal Online Interactions Using Social Network Analysis .....	776
<i>Álvaro Figueira</i>	
Context-Aware Combination of Adapted User Profiles for Interchange of Knowledge between Peers .....	782
<i>Sergio Gutierrez-Santos, Mario Muñoz-Orgaño, Abelardo Pardo, and Carlos Delgado Kloos</i>	
ReMashed – Recommendations for Mash-Up Personal Learning Environments .....	788
<i>Hendrik Drachsler, Dries Pecceu, Tanja Arts, Edwin Hutten, Lloyd Rutledge, Peter van Rosmalen, Hans Hummel, and Rob Koper</i>	
Hanse 1380 - A Learning Game for the German Maritime Museum .....	794
<i>Walter Jenner and Leonardo Moura de Araújo</i>	
A Linguistic Intelligent System for Technology Enhanced Learning in Vocational Training – The ILLU Project .....	800
<i>Christoph Rösener</i>	
e <sup>3</sup> -Portfolio – Supporting and Assessing Project-Based Learning in Higher Education via E-Portfolios .....	806
<i>Philip Meyer, Thomas Sporer, and Johannes Metscher</i>	
<b>Author Index .....</b>	<b>811</b>