What We Know About CSCL
And Implementing It In
Higher Education
The Computer-Supported Collaborative Learning Book Series is for people working in the CSCL field. The scope of the series extends to ‘collaborative learning’ in its broadest sense; the term is used for situations ranging from two individuals performing a task together, during a short period of time, to groups of 200 students following the same course and interacting via electronic mail. This variety also concerns the computational tools used in learning: elaborated graphical whiteboards support peer interaction, while more rudimentary text-based discussion forums are used for large group interaction. The series will integrate issues related to CSCL such as collaborative problem solving, collaborative learning without computers, negotiation patterns outside collaborative tasks, and many other relevant topics. It will also cover computational issues such as models, algorithms or architectures which support innovative functions relevant to CSCL systems.

The edited volumes and monographs to be published in this series offer authors who have carried out interesting research work the opportunity to integrate various pieces of their recent work into a larger framework.
What We Know About CSCL
And Implementing It In
Higher Education

edited by

Jan-Willem Strijbos
Paul A. Kirschner
Rob L. Martens

Open University of The Netherlands

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MAARIT ARVAJA is a Ph.D. candidate at the Institute for Educational Research at the University of Jyväskylä, Finland. The main focus of her research is collaborative learning in secondary school settings, especially the social and contextual aspects of collaboration.

CAROL K. K. CHAN is an Associate Professor at the Faculty of Education of The University of Hong Kong. Her main research interests are collaborative knowledge building, conceptual change, and assessment.

RICK DE GRAAFF is a consultant and researcher at the Centre for ICT in Education, part of the IVLOS Institute of Education, Utrecht University. His main consultancy and research areas are collaborative writing, peer feedback and task effectiveness in second language acquisition and in CSCL in higher education.

MAARTEN DE LAAT is a Ph.D. candidate at the Department of Education at the University of Nijmegen on ICT support for Communities of Practice. He also works for the Centre for ICT in Education at IVLOS, University of Utrecht, and he is Co-founder of KnowledgeWorks a software company that designs software to support learning and knowledge management.

PIERRE DILLENBOURG is Professor of Pedagogy and Training technologies at the Swiss Federal Institute of Technology in Lausanne. His main research area is computer-supported collaborative learning.

SANNA JÄRVELÄ is a professor of learning and educational technology at the Department of Education and the Research Unit for Educational Technology in the University of Oulu. Her main research areas social and motivational processes of computer supported collaborative learning.

PATRICK JERMANN is a permanent Senior Research Scientist of the Swiss Federal Institute of Technology Lausanne (EPFL), working in the Center for Research and Support of Training and its Technologies (CRAFT). His main research area are interaction regulation and computer-supported collaborative learning.

KAI HAKkarainen is the director of the Centre for Networked Learning and Knowledge Building, Department of Psychology, University of Helsinki. His research focuses on analysing how collaborative technology may be used to facilitate in-depth learning as well as sharing, creating and managing knowledge in education and workplaces.

PAIVI HÄKKINEN is Professor of Educational Technology at the Institute for Educational Research in University of Jyväskylä, Finland. Her main research interests are computer-supported collaborative learning and methodological innovations in research on learning environments.
PAUL A. KIRSCHNER is Professor of Educational Technology at the Educational Technology Expertise Center of the Open University of the Netherlands. His main research areas are affordances (technological, social and educational) for collaborative learning in (asynchronous distributed) groups, and the acquisition of complex skills and competencies.

KAREL KREIJNS is an Assistant Professor at the Department of Informatics of the Open University of the Netherlands. His main research interests are the application of ecological psychology in educational technology (focusing on CSCL environments) and the social psychology of using CMC in distributed learning groups (focusing on social presence theory).

PIRITTA LEINONEN works as a researcher at Department of Education and Research Unit for Educational Technology in the University of Oulu, Finland. Her main interests areas in research are processes of collaboration, awareness, and socially shared cognition in a context of technologically supported networked learning environment.

ALAN LESGOLD is professor and dean of the School of Education at the University of Pittsburgh. Before he served as executive associate director of the Learning Research and Development Center (LRDC). His current research interests are uses of digital video and web-based discussions in teaching and learning.

LASSE LIPPONEN is a postdoctoral researcher of Academy of Finland at the Department of Psychology, University of Helsinki. His main research area is collaborative, technology-mediated practices of learning and working.

KRISTINE LUND is an engineer in the Human and Social Sciences for the French National Scientific Research Center (CNRS) at the University of Lyon 2. She recently received her Ph.D. in Cognitive Science. Her main research interests include explanation and other epistemic activities in teaching and learning situations, as well as the role of context in their development.

ROB MARTENS is an Associate Professor at the Educational Technology Expertise Center of the Open University of the Netherlands. His main research interest is motivation in e-learning.

SAMPI PAAVOLA is a Ph.D. candidate in philosophy at the Centre for Research on Networked Learning and Knowledge Building at the University of Helsinki, Finland. His main research interests are models of discovery and theories of inquiry and learning.

HANS SCHELTINGA is a Teacher Educator at ILS School of Education in Nijmegen (the Netherlands). His main interest is coaching.
AMY SOLLER is a Postdoctorate Researcher at the Center for Research in Science and Technology (ITC-IRST) in Trento, Italy. Her research interests include artificial intelligence, computer-support for collaborative learning, user modelling, organisational learning, and intelligent analysis, modelling, and support for on-line collaborative learning.

GERRY STAHL explores the nature of collaboration from multiple aspects: designing software support, facilitating online problem-based learning in HCI or CSCL courses, analysing interactions, and leading research on virtual math teams. He is Associate Professor at the College of Information Science and Technology at Drexel University in Philadelphia, USA.

JAN-WILLEM STRIJBOS is a Ph.D. candidate at the Educational Technology Expertise Center of the Open University of the Netherlands. His main research interests are collaborative learning in (a)synchronous distributed learning groups, small group dynamics (social psychology) and analysis methodologies for CSCL.

JAN VAN AALST is an Assistant Professor at Simon Fraser University in Vancouver, Canada. His main research interests are in knowledge building and its implications for pedagogy and teacher education.
PREFACE

A Dutch policy scientist once said the information and knowledge in the twenty-first century has the shelf life of fresh fish, and learning in this age often means learning where and how to find something and how to relate it to a specific situation instead of knowing everything one needs to know. On top of this, the world has become so highly interconnected that we have come to realise that every decision that we make can have repercussions somewhere else. To touch as many bases as possible, we need to work with knowledgeable others from different fields (multiple agents) and take heed of their points of view (multiple representations). To do this, we make increasing use of computers and computer-mediated communication.

If computer-supported collaborative learning (CSCL) is not simply a newly discovered hype in education, what is it and why are we writing a book about it? Dissecting the phrase into its constituent parts, we see that first of all CSCL is about learning, and in the twenty-first century this usually means constructivist learning. The proximate modifier (adjective) is collaborative. To collaborate is to work jointly with others, in an endeavour. Thus, the work that is to be carried out is learning, and the way that it is done is with others. Finally, the ultimate modifier is computer-supported (a compound adjective). That the computer supports something means that it (in conjunction with the Internet) enables something to occur and/or that it keeps something going. The thing that the computer supports is thus collaborative learning. So, the answer to the first part of the initial question is that it is group-based learning, regardless whether this takes place face-to-face, via computer networks, or a through a mixture of both modalities.

Now that we know what it is all about, let’s attack the question why we are writing about CSCL. Amazon.com® yields 90 hits for collaborative learning and ten for CSCL or computer supported collaboration. A Google® search for the phrase and/or acronym produces more than 285,000 hits. Why then are we adding another title to this ‘real’ and ‘virtual’ bookshelf? First, our approach mirrors the preceding definition. Too many books begin with the medium and/or the environments used for CSCL as if you would write a book on building a house by focusing almost primarily on hammers, saws and screwdrivers. This book begins, thus, first with learning and specifically collaborative learning. It then discusses how this type of learning can be supported pedagogically and not simply technologically. Remember, it is all about learning! Finally, it discusses the use of computers and computer networks in that process.

A second reason lies in the subtitle of this book. Most of the ‘hits’ we came across deal with elementary and secondary education in which various forms of computer-supported collaborative learning have been quite successful. This book aims to go beyond these domains. The use of CSCL is increasingly advocated in higher education, but specific CSCL implementations - and this means something more than simply proving technology (newsgroup or forum) without a well developed educational rationale - are uncommon in the domain of higher education. Therefore we have chosen to present, when available, examples of CSCL practices in the domain of higher education.
Finally, we have chosen to write neither a strictly scientific book on the topic that would only be useful to researchers, nor a strictly practical book meant only for practitioners. We have chosen to write a book that tries to approach different aspects of computer-supported collaborative learning from both points of view, hopefully achieving a needed synthesis.

This book is divided in four sections. These sections are ordered according to the dissection of the CSCL acronym previously mentioned: it is all about learning via collaboration that can be supported with technology. The first section focuses on learning theory, educational design and the relationship between (research) orientations and subsequent (research) practices. Section two discusses the ontology of collaboration processes and how learning, assessment and collaboration interact and affect each other, or said more prosaically addresses the question of ‘what wags what?’. The third section deals with the different types of support in CSCL, namely instructional, computer software and human support. Section four addresses the use of technology from an institutional perspective, as well as technology design for CSCL. The chapters in section one serve as a theoretical frame of reference for the topics that will be covered in sections two, three and four. Each section is preceded by an introduction to the general theme of the section, as well as the topics covered by the chapters in that section. Each chapter presents an overview of theory and research, followed by examples of current best practices (if available) in the domain of higher education. The topics covered are:

**Section 1:** It is all about learning!
1. CSCL in higher education?
2. Practices and orientations of CSCL

**Section 2:** Learning, collaboration and assessment
3. Building collaborative knowing
4. Learning, assessment and collaboration

**Section 3:** What do you mean by ‘support’?
5. Instructional support in CSCL
6. Computer software support for CSCL
7. Human support in CSCL

**Section 4:** Technology and interaction
8. CSCL-ware in practice
9. Designing sociable CSCL environments

**Conclusion:** What we know about CSCL
How can such a diverse audience best use such a diverse book? Of course if one reads the book from front to back it would do justice to the philosophy behind the structure of the book, i.e. starting from the learning goals and in the last phase considering the technological support. Nevertheless, it will be more probable that most chapters will not be of equal interest to all of those that have purchased this book. A first general approach could be to use the section clustering. Those readers who are primarily interested in learning theory and design can focus on section one, whereas for others the issue of support in CSCL may be of more interest. A second general approach could be to focus on the topics covered in each chapter. Some chapters could be of more interest to you, because they discuss a topic that you have been struggling with in your research or your educational practice, for example how you can implement assessment in your CSCL environment. Perhaps you are writing your master’s thesis or dissertation on one of the topics covered.

Most books present a collection of various essays with little integration between the chapters. This book provides not only an extensive overview of the main topics in CSCL, but also their interrelationships which may help undergraduate and graduate students to grasp the complexity and richness of CSCL through topical reviews and discussion of best practices. For practitioners the chapters one (instructional design), four (learning and assessment), five (instructional support), seven (human support) and eight (CSCL-ware) may be of interest, as these provide practical guidelines on design, assessment, instructional and human support, as well as the delicate balance between institutional technology constraints and the type of technology best suited for a CSCL setting. For those involved in the design of CSCL environments or technology, the chapters one (instructional design), six (software support) and nine (interaction design) may be of most interest. Finally, this book offers to the research community an extensive overview of the CSCL landscape, supplemented with reviews of research results and discussion of current best practices - reflecting not only the diversity and complexity but also the richness and prospects for future research.

Our first aim was to create a book that presents an overview of main topics involved in the study and implementation of CSCL. The present manuscript fulfils this purpose in our opinion. Our second aim was to initiate interplay between ‘what we know’ from CSCL in the elementary/secondary domain to current practices in higher education. Although specific CSCL examples in higher education - and by this we do not mean the ‘hit and hope strategy’ of providing technology without any educational rationale - are difficult to find, the topical reviews and current best practices can stimulate informed implementation of CSCL in higher education.

Jan-Willem Strijbos
Paul A. Kirschner
Rob L. Martens

November, 2003

The book’s companion website is located at http://www.ou.nl/whatweknowaboutCSCL

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As first editor, I would like to thank a few people whose support has been critical throughout the past three years. First of all, I would like to thank Pierre Dillenbourg for going along with the crazy idea of a synthesis book on CSCL, and for caring about content and not status. Then of course there are my co-editors Paul and Rob. I would like to thank Paul for his practical advice based on his experience as an editor, and finding the time to meet in between numerous obligations. I thank Rob for going along with the crazy idea by his Ph.D. candidate to edit a book in the CSCL series, and his support throughout the entire process. Also, I would like to thank my promoter Wim Jochems for providing the opportunity to follow my ideas (as long as my thesis was not delayed!), and the Open University of the Netherlands, specifically the Educational technology Expertise Center, for facilitating a meeting between all authors that has contributed to the quality of this book. I thank my parents for their support throughout the years - no matter what I was up to; and Lisette - having a PhD in the family has been a tremendous support throughout my candidacy. Finally, but certainly not least, I would like to thank my colleagues for their support. Some of you warned me about the workload involved when editing a book, and you were right, I know that now. Nevertheless, it is well worth the effort and this book has been a three-year roller coaster ride, and I loved it.

Jan-Willem Strijbos

As editor, J-W deserves the most thanks for having the energy to get this off the ground. Without his monomaniacal effort and dedication this book never would have happened. I would also like to offer a special thank you to all of my colleagues in the research programme at the Educational Technology Expertise Center at the Open University of the Netherlands. Their research has stimulated me to think about what good CSCL is/can be and is thus my source of intellectual inspiration. Finally, I would like to thank my partner in life, soul and love, Catherine, for creating the room - physically, temporally, and mentally - that allows me to do what I do.

Paul A. Kirschner

Thank you Jan-Willem for not letting me down from the moment we had this crazy idea of you as a Ph.D. candidate being the first editor of this book. Great job! Thank you Doyna, my partner, for letting me know that there are things in life that are even more important than educational science.

Rob L. Martens
WHAT WE KNOW ABOUT CSCL

Many consider ‘Computer-Supported Collaborative Learning’ (CSCL) to be a new area of learning technologies. However, the first workshop that I remember that formally referred to CSCL was held in 1988. During these fifteen years, the scientific community has gained a large amount of experience and knowledge with respect to this subject. The aim of this volume is to provide the reader with a global appraisal of this knowledge.

The reader can be either a researcher studying the effects and/or use of CSCL or a practitioner making use of CSCL in her/his education. The authors propose a synthetic account of different facets of the field. However, this is not and this cannot be a recipe book. CSCL research has - of course - not produced a homogeneous and consistent set of results.

Why do social interactions produce impressive learning effects on some occasions while being seemingly useless on other occasions? Initial studies attempted to predict effectiveness by controlling a few factors, such as the composition of the group or the nature of the task. However, the results are often complex. For instance, many experiences with electronic forums have revealed low participation rates and therefore low learning outcomes.

Nevertheless, some forums have been used intensively and effectively. One could not, for the sake of brevity, discard these positive results and conclude that forums are not suitable in higher education. Instead, researchers attempt to grasp the differences between the pedagogical contexts in which the forums occurred to work and those in which they did not work well. The understanding of collaborative learning requires both a microanalysis of group interactions and a macro analysis with regard to the socio-cultural context in which learning occurs. This multi-level analysis combines contributions from multiple theoretical frameworks, which evolved along these fifteen years from cognitive and social psychology to linguistics and ethnology.

This book does not hide this mosaic of theories behind a simpler model designed for practitioners, but provides the reader with a conceptual map of the domain. The goal is to give a fair picture of a complex domain, therefore the picture is itself complex. The editorial line of this CSCL series is to provide authors with the space needed to reflect the subtlety of the field. This concern for a fair account of controversial results makes this book very suitable for a researcher who would appreciate an overview of the field.

Pierre Dillenbourg