Selected articles related to the design and use of technology to support collaborative learning. There is a lot of research about specific types of collaborative learning (also referred to as cooperative learning) and what is effective. I limited this search to articles that were more general at this time.

Abstract: In this paper, we present a web-based educational setting, referred to as SCALE (Supporting Collaboration and Adaptation in a Learning Environment), which aims to serve learning and assessment. SCALE enables learners to work on individual and collaborative activities proposed by the environment with respect to learners’ knowledge level, (ii) participate actively in the assessment process in the context of self-, peer- or collaborative-assessment activities, (iii) work with educational environments, embedded or integrated in SCALE, that facilitate the elaboration of the activities and stimulate learners’ active involvement, (iv) use tools that support the synchronous and asynchronous collaboration/communication and promote learners’ interaction and reflection, and (v) have access to feedback components tailored to their own preferences. Also, learners have control on the navigation route through the provided activities and feedback components, personalizing in this way the learning process. The results revealed from the formative evaluation of the environment are positive and encouraging regarding the usefulness of the supported capabilities and tools.

Daradoumis, T., Martinez-Monés, A., & Xhafa, F. (2006). A layered framework for evaluating on-line collaborative learning interactions. International Journal of Human-Computer Studies, 64(7), 622-635. Abstract: Evaluating on-line collaborative learning interactions is a complex task due to the variety of elements and factors that take place and intervene in the way a group of students comes together to collaborate in order to achieve a learning goal. The aim of this paper is to provide a better understanding of group interaction and determine how to best support the collaborative learning process. To that end, we propose a principled framework for the study and analysis of group interaction and group scaffolding which is built by combining different aspects and issues of collaboration, learning and evaluation. In particular, we define learning activity indicators at several levels of description which prompt to the application of a mixed interaction analysis scheme and the use of different data types and specific tools. At an initial layer, the basis of the approach is set by applying a qualitative process for evaluating the individual and group task performance as well as the group functioning and scaffolding. The interaction analysis process is completed by defining and applying two more layers: a social network analysis of the group activity and participation behaviour and a quantitative analysis of group effectiveness as regards task achievement and active interaction involvement. Our work defines a grounded and holistic conceptual model that describes on-line collaborative learning interactions sufficiently and applies it in a real, web-based, complex and long-term collaborative learning situation. An in-depth empirical evaluation of the conceptual model is fully discussed, which demonstrates the usefulness and value of the approach.


Fisher, M. (2003). Online Collaborative Learning: Relating Theory to Practice. Journal of Educational Technology Systems, 31(3), 227-249. Abstract: Educational institutions have rushed to provide online courses; however, too often schools have discovered the difficulty in transferring effective teaching strategies in the classroom to an online environment. A unique aspect of quality online courses is how they rely heavily on effective collaboration to create a meaningful learning environment. Unfortunately, online instruction is not as simple as replicating the community atmosphere that is found in the traditional brick and mortar classroom. New strategies are demanded for the successful transfer of knowledge utilizing the Web. Investigating the pedagogical strategies of a program that promotes dialogue and collective intellect in a community model could benefit faculty designing courses. We will present a detailed case study using a mixture of quantitative and qualitative methods (including observation, focus groups, transcripts from synchronous and asynchronous discussions, surveys, and interviews) collected over a two-year span to identify perceptions of effective online collaboration and performance. Community formation, support, and sustainability are also explored. Examples are included that not only describe what participants perceive as enabling aspects of the support system but also ways in which educators can enhance program development by learning from other pioneers in this area.

Garrison, D. R., Anderson, T., & Archer, W. (1999). Critical Inquiry in a Text-Based Environment: Computer Conferencing in Higher Education. The Internet and Higher Education, 2(2-3), 87-105. Abstract: The purpose of this study is to provide conceptual order and a tool for the use of computer-mediated communication (CMC) and computer conferencing in supporting an educational experience. Central to the study introduced here is a model of community inquiry that constitutes three elements essential to an educational transaction—cognitive presence, social presence, and teaching presence. Indicators (key words/phrases) for each of the three elements emerged from the analysis of computer-conferencing transcripts. The indicators described represent a template or tool for researchers to analyze written transcripts, as well as a guide to educators for the optimal use of computer conferencing as a medium to facilitate an educational transaction. This research would suggest that computer conferencing has considerable potential to create a community of inquiry for educational purposes.

Abstract: Today, a variety of web-based learning environments have been developed for educational purposes, especially in higher education and continuing education courses. At the same time many studies have reported how networked interaction in many learning projects results in superficial and experience-based discussion, and does not reach the level of theory-based reflections and argumentation [e.g. W.F. Admiraal, D. Lockhorst, T. Wubbels, F. A.J. Korthagen & W. Veen (1998) "Computer-mediated communication in teacher education: computer conferencing and the supervision of student teachers," Journal of Learning Environment Research, 1(1), pp. 59-74]. Challenged by this, this research project investigates social construction of knowledge in Computer-Supported Collaborative Learning settings, especially the possibilities and problems of shared virtual environments in supporting learning and interaction. The first of two related sub-projects is focused on using shared workspaces and cognitive tools to support co-construction of understanding in complex science and civic phenomena in secondary school settings. The other project aims to develop the kind of pedagogical models for teacher training purposes that would facilitate deeper-level interaction and argumentation in networked communication.


Abstract: The purpose of this study is to examine the dynamics of online collaborative learning and communication media regarding team projects. Media richness and social presence theories are well-accepted rational theories that explain media choices and media behaviors, and serve as the theoretical framework. Quantitative and qualitative data collection methods were used to gather data from the 26 graduate students participating in this study, conducted at a land-grant university in the southeastern United States. Quantitative data analyses revealed significance between pre- and post-course survey item themes regarding factors affecting successful collaboration and perceptions on online collaboration. Qualitative analyses revealed relationships between collaboration and communication media, factors necessary for successful online collaboration, and communication media selection decisions. The results may serve to guide research and practice in online collaborative learning by using communication media. This research may also guide instructors and instructional designers in developing online collaborative learning activities with communication media. (Contains 1 table.)


While an abundance of research exists on best practices in the face-to-face classroom, the same is not true for online learning. In this new and constantly evolving environment, researchers are just beginning to understand what constitutes effective learning strategies. One of the most well recognized models for explaining online learning is the Community of Inquiry Framework (CoI). However, despite its recent empirical validation, the CoI provides only general indicators of effectiveness, not guides to specific practices. This study looks at a common practice, providing students with feedback, and assesses whether narrowly targeted, individualized feedback or group feedback is more effective. Through mixed methods research, the authors examined student preferences and strategies by student level, finding that while there is no one best solution there are strategies that appear most appropriate for different learner levels. Suggestions for implementing best practices and directions for future research are also discussed.


Abstract: In our recent research we have explored possibilities to scaffold collaborative learning in higher education with wireless networks and mobile tools. The pedagogical ideas are grounded on concepts of collaborative learning, including the socially shared origin of cognition, as well as self-regulated learning theory. This paper presents our three design experiments on mobile, handheld supported collaborative learning. All experiments are aimed at investigating novel ways to structure and regulate individual and collaborative learning with smartphones. In the first study a Mobile Lecture Interaction tool (M.L.I.) was used to facilitate higher education students’ self-regulated learning in university lectures. In the second study smartphones were used as regulation tools to scaffold collaboration by supporting externalization of knowledge representations in individual and scaffolded collaborative levels. The third study demonstrates how face to face and social software integrated collaborative learning supported with smartphones can be used for facilitating socially shared collaboration and community building. In conclusion, it is stressed that there is a need to place students in various situations in which they can engage in effortful interactions in order to build a shared understanding. Wireless networks and mobile tools will provide multiple opportunities for bridging different contents and contexts as well as virtual and face to face learning interactions in higher education.


Abstract: Much has been written about the barriers to collaborative work, but little research has been conducted on how to foster collaboration within higher education. This article presents the results of a case study of four campuses that have organized to enable collaboration. The study builds on earlier literature from the corporate sector using a model developed by Mohrman, Cohen, and Mohrman (1995). The main finding is the development of a model that can be used to redesign higher education to enable collaboration including the following elements: (a) mission/philosophy; (b) campus networks; (c) integrating structures; (d) rewards; (e) a sense of priority from people in senior positions; (f) external pressure, (g) values; and (h) learning.


Abstract: When a computer-based tool or application is used to carry out a specific task in a learning situation - that is, it is used for learning]more effectively or efficiently one speaks of learning "with" the tool or application. When, possibly, that same tool or application is used to enhance the way a learner works and thinks, and as such has effects that reach further than the learning situation in which it is used, then one speaks of learning "from" the tool or application. This article concentrates on the latter. It zooms in on the use of mindtools in education]computer programs and applications that facilitate meaningful professional thinking and working]because this is the episteme of learning "from" ICT. Mindtools and cognitive tools help users represent what they know as they transform information into knowledge and are used to engage in, and facilitate, critical thinking and higher order learning. These tools can be as simple as email and/or discussion lists and as complicated as argument mapping and visualization systems. Even more specifically, it deals with one category of such tools, namely conversation tools; tools used to create and facilitate the establishment of technology-supported discourse communities]communities of practice - where collaboration can flourish. (Contains 1 footnote.)

Abstract: Educational technology innovations enable students to collaborate in online educational tasks, across individual, institutional, and national boundaries. However, online interactions across these boundaries are seldom transparent to each other. As a result, students are not motivated to share their best learning practices. Also, there is no singular basis on which one can compare learning practices of multiple students. In addressing these problems, we offer a solution that encourages students to record and share their learning interactions using our ontology-oriented theory-centric software tool. In doing so, students not only observe the products of their learning but also the process of how they learnt. These unique and computationally formal recordings of learning interactions not only allow educators to observe how learners learn, but also provide opportunities for learners to reflect on their understanding of meta-cognitive processes that they employed or neglected in their learning. Further, these recordings feed our software system to autonomously analyze students' learning behaviour and to actively promote self- and co-regulation among learners. This article presents the need for such a system, the architecture of the system, and concludes with key experimental observations from software prototypes.


Abstract: The purpose of this study is to develop a Web assisted knowledge construction (WAKC) system as an individual knowledge construction tool for Internet users. The system is based on the theory of constructivist knowledge analysis of tasks (CKAT). The CKAT integrates constructivist reflection cycle and knowledge analysis of tasks. The conceptual model of CKAT includes four different stages: knowledge objective, knowledge gathering, knowledge analysis, and task knowledge structure. In order to match these four stages, this research designs an assisted knowledge construction system that includes four systematic sub-functions: the keyword function, the URL resource function, the analysis function, and the construction function. After understanding users' perceptions toward the WAKC system, users have highly positive behavioral intention to use the system as a Web-based assisted knowledge construction tool. (C) 2004 Elsevier Ltd. All rights reserved.


Abstract: The Web-based technology is a potential tool for supported collaborative learning that may enrich learning performance, such as individual knowledge construction or group knowledge sharing. Thus, understanding Web-based collaborative learning for knowledge management is a critical issue. The present study is to investigate learners' attitudes toward Web-based collaborative learning systems. Based on this research, the results of factor analysis show that five attitude factors (system functions, system satisfaction, collaborative activities, learners' characteristics, and system acceptance) should be examined at the same time when building a Web-based collaborative learning system. The results also provide an acceptance model for understanding users' behavioral intention of facilitating Web-based collaborative systems. (C) 2006 Elsevier Ltd. All rights reserved.


Abstract: Designing collaborative learning environments is dependent upon the descriptive knowledge base on learning and instruction. Firstly, the evolution in conceptions of design towards collaborative learning is described, starting from designing as an intuitive behaviour. Secondly, collaborative learning is described from different angles, like individuals-in-context, learner communities, including motivational factors and distributed cognition. It is evidenced that the adequate use of collaborative learning settings may contribute to the learning quality. Thirdly, the implications of collaborative theories on instructional design are outlined, centred around: student, knowledge, assessment and community. The interplay between these perspectives is challenged in new models of (co) design. In the conclusion, an interactive approach of designing environments is advocated.


Abstract: This book offers a complete understanding of the notions, techniques, and methods related to the research and developments of web-based e-learning systems.—Provided by publisher.


Abstract: This paper presents a framework for online collaborative learning, also known as telecollaboration. At the centre of this flexible framework are online collaborative educational experiences where knowledge creation and knowledge in action are the nexus of social, teaching and cognitive presence based on the “Community of Inquiry” model of Garrison, Anderson and Archers [Garrison, D.R., Anderson, T., and Archer, W. (1999). “Critical thinking in a text-based environment: Computer conferencing in higher education.” Internet and Higher Education,” 2(2-3), 87-102]. The framework provided should guide educators as they design, develop and implement authentic educational experiences within local, national or international settings in partnership with other educational stakeholders. (Contains 3 figures.)


Abstract: This paper reviews the research conducted in the last 20 years on the application of technology in support of collaborative learning in higher education. The review focuses primarily on studies that use Internet-based technologies and social interaction analysis. The review provides six sets of observations/recommendations regarding methodology, empirical evidence, and research gaps and issues that may help focus future research in this emerging field of study.


Abstract: Although most online learning environments are predominately text based, researchers have argued that representational support for the conceptual structure of a problem would address problems of coherence and convergence that have been shown to be associated with threaded discussions and more effectively support collaborative knowledge construction. The study described in this paper sets out to investigate the merits of knowledge mapping representations as an adjunct to or replacement for threaded discussion in problem solving by asynchronously communicating dyads. Results show that users of knowledge maps created more hypotheses earlier in the experimental sessions and elaborated on them more than users of threaded discussions. Participants using knowledge maps were more likely to converge on the same conclusion and scored significantly higher on post-test questions that required integration of information distributed across dyads in a hidden profile design, suggesting that there was greater collaboration during the session. These results were most consistent when a knowledge map with embedded notes was the primary means of interaction rather than when it augmented a threaded discussion. The paper also offers a methodological contribution: a paradigm for practical experimental study of asynchronous collaboration. It is crucial to understand how to support collaborative knowledge construction in the asynchronous settings prevalent in online learning, yet prior experimental research has focused on face-to-face and synchronous collaboration due to the pragmatic problems of conducting controlled studies of asynchronous interaction. A protocol is outlined that enables study of asynchronous collaboration in a controlled setting. Copyright (c) 2008 Elsevier Ltd.


This research bulletin examines the wiki philosophy and how it fits within the Web 2.0 context. While wikis offer a number of benefits for supporting knowledge creation in collaborative groups, the literature suggests a strong need to establish conventions to enable long-term success. Based on an extensive literature review, the results of a research project into blog and wiki use in Australian libraries, and evaluations of the wiki installation of the RUBRIC Project sponsored by the Australian Commonwealth Department of Education, Science, and Training, the bulletin also examines how wiki technology can enable the online collaborative process. PDF