Applying Computer Supported Collaborative Learning Principles to Telecollaboration

Prepared for LLMC Conference, 2009
National Foreign Language Resource Center
University of Hawaii at Manoa

Daniel Roggenkamp

Background

A number of parallels exist between theories of computer supported collaborative learning (CSCL) and second language acquisition (SLA), especially with regards to concepts of group cognition, social and cultural aspects of learning, and the roles of interaction in learning. These parallels would seem to indicate good potential to apply CSCL principles and concepts to the design of a computer supported collaborative language learning environment. Although there is little published research that specifically examines the application of CSCL principles to foreign language learning and teaching, there is a growing body of collaborative web-based language learning programs and related research, and these efforts will most likely prove to be valuable resources to future designers of CSCL-based foreign language learning and teaching environments.

Theoretical Frameworks

The field of CSCL is relatively new, and although a great deal of research has been done on collaborative and cooperative learning in the traditional classroom (Clark and Mayer, 2003; Stahl, Koschmann, and Suthers, 2006), Clark and Mayer (2003) note that little research has been done with regards to applying collaborative network tools to web-based learning, and O’Dowd and Ritter (2006) have found that there is a lack of research into effective task design for collaborative web-based language learning activities.

Although collaborative learning is often used as a synonym for cooperative learning, Dillenbourg (as cited in Stahl et al, 2006, p. 3) makes an important distinction in that, "In cooperation,
partners split the work, solve sub-tasks individually and then assemble the partial results into the final output. In collaboration, partners do the work together." Furthermore, Stahl (2006) identifies a number of processes and outcomes specific to collaborative learning, including group meaning making, shared understanding, and group cognition. Additionally, Roschelle and Teasley (as cited in Stahl et al, 2006, p. 3) emphasize the role of computers in education as being tools for social learning, learning that results from collaborative problem solving and negotiation and sharing of meaning.

**CSCL and CALL**

The field of CSCL gained momentum in the 1990s in response to learning software that isolated individual students and discouraged collaboration (Stahl et al, 2006). Galvin (as cited in Clark and Mayer, 2003. p. 205) found that around 77 percent of E-learning is designed for individual use.

The practice of emphasizing training of the individual learner is widespread in the field of computer assisted language learning. The term computer assisted language learning (CALL) is derived from the more general term computer assisted instruction (CAI). Historically, CAI and CALL have taken mechanistic approaches to training individual students. To this day, CAI and CALL software is often designed according outdated behaviorist approaches (Jamieson, 1994; Sanz, 2002; Stahl et al 2006).

Software designed for solo use and according to behavioristic principles is ubiquitous in language laboratories which usually have students sitting in isolation, often literally separated from one another by physical partitions, and such language lab design and software has resulted in language laboratories having a bad reputation to this day (Perez, 2002).

The history of the application of technology to SLA is important because, although language laboratories are not the focus of this research, they do represent the predominant computer supported language learning environment to date, and as Perez (2002) has noted, the old paradigm of behaviorist language laboratories persists. A perusal of publicly accessible on-line language learning materials
finds that this outdated language lab model is often transferred to on-line language learning in the form of mechanistic quizzes and drill-based material.

Clearly the development of CSCL and CALL frameworks have followed different paths. CALL is largely behaviorist in nature and has been slow to adopt modern technology and theory (Perez, 2002) while the much newer field of CSCL came into being partly to counter restrictive behaviorist approaches to the application of computer and network technology to education and learning (STAHLM et al, 2006). This may help explain the confusing lack of literature examining applications of CSCL theory to CALL.

The shortage of CSCL-oriented CALL research is particularly surprising when one considers that, as Brown (2000) points out, virtually all modern foreign language teaching methods have grown out of the communicative language teaching (CLT) movement in SLA beginning in the 1980's. CLT is an approach that maintains that effective foreign language learning results from communicative, unrehearsed, meaningful, authentic, and interactive use of the target language (Brown, 2000). These cornerstones of CLT are collaborative in nature, and so although it may not be surprising that CSCL theories recognize the value of collaboration more explicitly than do SLA theories, it is surprising that published works in SLA, and specifically CALL, have not embraced the collaborative nature of CSCL to a greater degree.

Additional parallels exist between theories of CSCL and SLA, and it makes intuitive sense that these parallels indicate good potential for complementarity. Lehtonen and Tuomainen (2003), in one of the few published papers that explicitly looks at the application of CSCL to foreign language learning and teaching, discuss a variety of theoretical frameworks that are shared by both CSCL and SLA, including collaboration theories and principles, Vygotsky’s theories of social constructivism and the zone of proximal development (ZPD), problem-based learning, and meaningful interaction.

**CSCL environments and practices**
CSCL environments vary, and may comprise groupware specially designed for CSCL, collaborative implementations of computer mediated communication (CMC) tools, or the simultaneous use of a variety of CMC tools for the purpose of collaboration (Lehtinen, Hakkarainen, Lipponen, Rahikainen, & Muukkonen, 1999). And yet, success of CSCL is often seen to depend more on how technology is implemented and how well activities and interaction are planned rather than the technology used (Bauer, deBenedette, Furstenberg, Levet, & Waryn, 2006; Lehtinen et al.)

There is an abundance of software, platforms, and environments that are referred to as being collaborative. For example, Lehtinen et al. (1999) note that Email has been used for the purpose of collaborative learning. And although the term groupware is often used synonymously with collaborative software, more recent CSCL environment design distinguishes a CSCL environment from earlier groupware designed more for commercial and professional uses, often called computer-supported collaborative work (CSCW) groupware, in that a CSCL environment is designed for knowledge negotiation and iterative group design, discussion, and development of shared knowledge artifacts, with emphasis on collaborative knowledge building, while CSCW groupware is more oriented towards file management and production. (Kligyte & Leinonen, 2001; Stahl, 2005).

Promising CSCL environments have been produced by the Innovative Technologies for Collaborative Learning (ITCOLE) project, funded by the European Commission’s Information Society Technologies program (IST). Two related environments resulting from the ITCOLE project are Synergeia and FLE3. These systems are designed for collaborative learning rather than collaborative work, and as such they support a high degree of negotiation, file versioning, and flexibility with regards to personal and group space. ITCOLE software was designed for flexibility, adaptability, and pedagogical usability (Hakkarainen, Lakkala, Rahikainen, & Seitamaa-Hakkarainen, 2001). FLE3, for example, is designed to allow users to develop artifacts together via a hierarchy of spaces ranging from public areas in which all users can collaborate on and modify various artifacts, to semi-private areas where users can benefit from viewing but not altering their cohorts’ Webtops (Dean & Leinonen, 2003).
This emphasis in FLE3 on shared working space and group knowledge building differs considerably from some popular course management systems (CMS) such as Blackboard and Moodle which, although having some collaboration tools, emphasize content management over collaboration. The collaboration tools in popular CMS systems are peripheral to the functioning and use of the systems, while in CSCL environments such as Synergeia and FLE3, the collaboration tools are central to the system (Kligyte & Leinonen, 2001).

**Collaborative CALL: Telecollaboration**

Although there are very few examples of the application of CSCL principles to language learning, there are web-based language learning and exchange programs and approaches that appear to have much to offer to the design of a CSCL-based language learning environment. Web-based language learning environments that seem to have the most in common with CSCL are generally referred to as being telecollaborative. Telecollaboration programs include planned sequences of bilingual group projects, usually combining culture learning with language learning. (Bauer, deBenedette, Furstenberg, Levet, & Waryn, 2006; Belz, 2004; Hauck, 2007). O’Dowd and Ritter (2006, p. 1) define telecollaboration as “the use of online communication tools to bring together language learners in different countries for the development of collaborative project work and intercultural exchange.”

Three telecollaborative programs stand out as being particularly promising: The Cultura project (http://web.mit.edu/french/culturaNEH/; Furstenberg, Levet, English, & Maillet, 2001), the MITUPV Exchange (http://mitupv.mit.edu/), and The Penn State Foreign Language Telecollaboration Project (Belz, 2004). These programs have the following in common:

- Groups of language learners at different universities, each learning the other’s language, work together using Internet-based communications to engage in social interaction, cultural exchange, language learning and exchange, and debate.

- There is a high degree of emphasis placed on sharing and learning of culture, not just language.
In addition to the ability to participate in open-ended dialogue via discussion boards and other CMC tools, there are established and well defined activities and projects, such as the sharing of answers to questionnaires, sharing of electronic multimedia files that are in some way representative of one’s culture or living situation, and comparison and debate of current events and popular culture, particularly with regards to the extent that they differ between the groups’ cultures.

Although the above programs are exciting and seem to have good potential, they lack a key element of CSCL, and that is an explicitly stated emphasis on and requirement for collaborative negotiation and construction of shared knowledge artifacts, and the design elements that would reflect that emphasis. The Cultura Approach, for example, is described not as collaborative, but as comparative (Bauer et al., 2006). The Penn State Foreign Language Telecollaboration Project seems to come closer to embracing CSCL-like collaboration by requiring in phase III of the project that participants produce a bilingual comparative essay focusing on the quality of interactions during the project (Belz, 2004). However, it is not clear in the literature to what extent these essays are to be written collaboratively.

**Telecollaboration: Research**

Research has found that telecollaboration programs are particularly vulnerable to frustration and failed communication among participants due to differences in the linguistic, academic, and institutional cultures of the groups involved (Bauer et al., 2006; Belz, 2001; Belz, 2004; O’Dowd & Ritter, 2006). Thorne (2003) has demonstrated that CMC tools and practices are culturally bound and discusses CMC as being subject to *electronic cultures-of-use*. This observation that CMC is practiced differently between not only cultures, but also between age groups and subcultures within cultures, has also been reflected in research by Belz (2001), O’Dowd and Ritter (2006), and Reeder, Macfadyen, Roche, & Chase (2004). Recognition that multicultural CMC is susceptible to failed communication suggests that the design of a CSCL language learning environment would require an exceptional
amount of planning, preparation, and sensitivity with regards to not only linguistic differences, but also
to differences in electronic and academic cultures of the collaborators.

An additional consideration is the multi-modal, polycontextual nature of CMC in
telecollaboration as has been reported by Belz (2004), Hauck (2007), Saarenkunnas, Kuure, & Taalas
(2003), and Thorne (2003). Multimodality refers to an individual’s use of a variety of CMC tools,
sometimes simultaneously, and their choice of a preferred tool or method according to the context of
the interaction. Multimodality is of special importance to the design of a multicultural CSCL
environment because modality choice is in part culturally bound, and as Thorne (2003) has found,
failed communication may result when interlocutors cannot use their preferred modality of CMC either
due to technical constraints or cultural differences. This suggests that a language learning CSCL
environment might benefit from allowing for multimodality and individual choice of CMC tools.

Sample environment

FLE would make an ideal environment; however, if for some reason using the FLE environment
is not possible, it is possible to create such an environment using a combination of CMC tools such as a
wiki and message board, possibly in combination with a course management system such as Moodle.
The importance is not the environment source, but the environmental functions, which should include:

- group file sharing and versioning,
- semi-private areas similar to the FLE webtops, and,
- a full range of CMC tools including instant messaging, message board, text chat, and ideally a
  function allowing participants to integrate their chosen form of CMC and their chosen tool,
  such as their own instant messaging client, into the umbrella environment.

Ultimately, the design of the environment must be guided by the needs and constraints of
participants. The functional requirements outlined above can be achieved in a variety of ways.

Sample activity
As with the environment, any CSCL/telecollaborative activity must be custom designed according to the needs, abilities, and technical and institutional constraints of stakeholders.

The most distinguishing element of a CSCL/telecollaborative activity with regards to established telecollaborative programs is the inclusion of and focus on one or more bilingual shared knowledge artifacts, the negotiation and iterative creation in which learners from both language groups take part.

The envisioned CSCL inspired telecollaborative activity is a culminating, collaborative activity, a capstone if you will, appended to a telecollaborative project based on and very similar to established projects such as Cultura. This culminating group project will result in a bilingual telecollaborative shared knowledge artifact. This artifact might be primarily textual, visual, aural, or multimedia.

As with established telecollaboration programs such as Cultura, participants will engage in discussion regarding answers to questionnaires, parallel texts, and cultural artifacts such as movies and important documents (Furstenberg et al, 2001). Approximately midway through the project, participants will choose one topic from among the topics discussed and form small groups of between two to six participants equally drawn from both language groups, and based on shared topics of interests. These will be the working groups for the bilingual telecollaborative shared knowledge artifact, and the iterative, negotiated, collaborative production of this artifact will be a primary focus, but not the only activity, for the remainder of the telecollaborative program.

The goal of the shared knowledge artifact is not to state conclusions. On the contrary, the group may come to no firm conclusions at all, and they are not required to. The goal of the artifact, rather, is to document impressions and new knowledge or awareness that is the result of the collaborative exploration of the chosen topic in both cultures and both languages. The artifact can also document the process itself, including difficulties, failures to communicate, and high and low points in the process.
The language acquisition value lies in the ownership, through collaboration, that each individual takes in the artifact. This ownership drives not only motivation to explore and shape bilingual elements of the artifact, but also the intercultural elements.

**Expected Findings and Implications**

Research has found that more productive collaboration results when learning activities are highly structured and well defined (Clark and Mayer, 2003; Hauck, 2007; Lehtonen & Tuomainen, 2003). With this in mind, I expect to find that carefully designed and clearly structured activities will produce better results than more loosely defined collaboration.

Given the findings that cultural differences can result in failed communication as discussed above, I expect that participants will experience some amount of frustration in their efforts to collaborate, and there will be instances of failed communication. This is particularly likely given the profound cultural differences between Western and Chinese educational systems, roles, and expected behaviors. The potential for frustration and failed communication can be greatly reduced by careful coordination between the teachers and facilitators, a preliminary orientation period for the participants, and careful selection of tasks. Also, culturally-based obstacles to collaboration can be addressed in successive iterations of the environment. However, the cultural differences between Western and Chinese education, educational roles, and concepts of individual and group are so large that problems can be expected and addressing those differences may prove to be the basis for effective collaborative tasks.

The implications of positive findings are exciting. Effective computer supported collaborative language learning has the potential to open up new avenues of linguistic and cultural learning that are not presently available in traditional face-to-face educational settings. On a wider note, in that this research will attempt to bridge cultural and institutional differences in a CSCL environment, positive findings may be applicable to other CSCL applications comprising collaborators from quite different professional and academic backgrounds. Just as there are linguistic and educational cultures, there are
also professional cultures, and so positive findings may be applicable to a CSCL environment comprising people from diverse professions and disciplines.

**References**


