<table>
<thead>
<tr>
<th>Title</th>
<th>Multipoint desktop videoconferencing as a collaborative learning tool for teacher preparation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Author(s)</td>
<td>Leslie Sharpe, Chun Hu, Lachland Crawford, Saravanan Gopinathan, Swee Ngoh Moo and Angela F. L. Wong</td>
</tr>
<tr>
<td>Source</td>
<td><em>Educational Technology</em>, 40(5), 61-63</td>
</tr>
<tr>
<td>Published by</td>
<td>Educational Technology Publications</td>
</tr>
</tbody>
</table>

This document may be used for private study or research purpose only. This document or any part of it may not be duplicated and/or distributed without permission of the copyright owner.

The Singapore Copyright Act applies to the use of this document.

Copyright © 2000 by Educational Technology Publications, Inc.

This article was originally published in *Educational Technology*, Vol. 40 No. 5, pp. 61-63. Archived with permission of the publisher.
Multipoint Desktop Videoconferencing as a Collaborative Learning Tool for Teacher Preparation

Leslie Sharpe  
Chun Hu  
Lachlan Crawford  
Saravananan Gopinathan  
Swee Ngoh Moo  
Angela F. L. Wong

Rapid technological development in the past decade has made it easier than ever to use technologies as collaborative learning tools. Computer video conferencing as a computer-supported collaborative learning (CSCL) technology brings learners closer to real-world environments and provides increasing opportunities for learners to share experiences across time and space. This article describes how multipoint desktop video conferencing (MDVC) is used in preservice teacher education programs in Singapore to enhance the professional development of student teachers by allowing them to share ideas, experiences, and teaching resources in real time with an audience wider than the schools in with they teach.

Leslie Sharpe is Associate Professor, School of Education, National Institute of Education, Nanyang Technological University, Singapore. Chun Hu is Assistant Professor, School of Education, National Institute of Education, Nanyang Technological University, Singapore. Lachlan Crawford is Associate Professor, School of Education, National Institute of Education, Nanyang Technological University, Singapore. Saravananan Gopinathan is Dean, School of Education, National Institute of Education, Nanyang Technological University, Singapore. Swee Ngoh Moo is Associate Professor, School of Education, National Institute of Education, Nanyang Technological University, Singapore. Angela F. L. Wong is Associate Professor, School of Education, National Institute of Education, Nanyang Technological University, Singapore.

The Teaching Practice Discourse and Computer Communications Technology Project of the National Institute of Education, Singapore, builds on a previous research effort that investigated the discourses between student teachers and their university supervisors (Sharpe et al., 1994). The early research found that there was a preponderance of low-level factual discourse in student teacher-supervisor conferences, and that conferences were relatively short. It concluded that ways and means had to be found to increase both the quantity and quality of student teacher-supervisor discourse.

The appearance of multipoint desktop video conferencing (MDVC) technology brings a hope that this new communication technology may help to break down barriers of time and space that limit the quantity and quality of professional sharing. As MDVC enables student teachers to interact with their supervisors and peers without leaving their school premises, it is also hoped that the level of critical discourse between student teachers and their supervisors may be increased.

Sociocultural Theory and Electronic Learning Environments

During the evolution of computer-supported collaborative learning technologies, researchers have increasingly embraced Vygotsky’s sociocultural theory (Vygotsky, 1986) in evaluating and understanding electronic learning environments (Bonk & Cunningham, 1998). Vygotsky’s theory postulates that individual mental functioning is inherently situated in social interactional, cultural, institutional, and historical contexts, and that learning occurs through social interactions with peers, mentors, and experts. Researchers holding sociocultural views have begun to concentrate their investigations on the role of social interactions and dialogues, scaffolding instructions, and collaboration in computer conferencing environments (Iseke-Barnes, 1996). The focus is shifting from discussions on tool features and procedures to the theoretical rationale or justification for using technologies, and to studies on how technologies can augment and redefine the academic learning environment (Koschmann, Myers, Feltovich, & Barrows, 1994).

Various technology tools can now support activities for joint knowledge-building, expert mentoring, and peer commenting and review (Scardamalia & Bereiter, 1996). However, tools are not enough (Riesbeck, 1996). Learning theorists claim that when learning is situated in meaningful contexts, requiring collaborative processing, students tend to remember the information better (Brown et al., 1989; Cognition and Technology Group at Vanderbilt, 1991). Learners need to have access to the real “carpenters” or practitioners of this environment (Riesbeck, 1996), who can help evaluate...
and validate their practice. In the case of teacher education activities on the Web, expert guides (university supervisors and practicing teachers) are needed to help students in their electronic dialogues (Bonk, Malikowski, Angeli, & East, 1998). In addition, peer comments and review are also necessary as scaffolding to facilitate video conferencing.

As a teaching method, scaffolding is intended to recruit the interest of a learner, note critical learning discrepancies, reduce learner frustration, and demonstrate expert-like performance (Bonk & Kim, 1998). Electronic scaffolding might include providing hints to solve a problem, elaborating on task requirements, asking questions, requesting the learner to provide more explicit information, simplifying the task when the learner experiences difficulty, or guiding performance toward key course concepts (Bonk & Cunningham, 1998; Bonk & Kim, 1998). The objective is to actively engage the learner with support until it is no longer required.

Using sociocultural theory as a framework, we hope to find unique opportunities in MDVC so that both peer and mentor electronic dialogues and interchanges may be enhanced. As student teachers share their experiences and discuss possible solutions to problems encountered in teaching, they are exposed to alternative teaching strategies and viewpoints. Timely feedback, questions, and reconceptualizations from both supervisors and peers may further fuel these learning activities because of the relevance of the discussions to teaching. Shared electronic experience will stimulate interpersonal understanding and new knowledge among the learning participants (Sproull & Kiesler, 1993).

Teaching Practice Discourse and Computer Communications Technology Project

Desktop video conferencing allows users at different locations to see and hear each other using ordinary desktop computers fitted with cameras, microphones, speakers, and necessary hardware and software. Desktop video conferencing may be point-to-point, meaning persons talking to each other from two separate desktop computers, or it may be multipoint, that is, several persons conferencing from multiple desktop computers. For the purpose of our project, we needed a system that could link student teachers across schools, and the choice had to be multipoint. Traditionally, desktop video conferencing has used ISDN telephone lines. Leasing of ISDN lines is costly, and video and audio effects are poor.

Fortunately, technological developments provide us with the solution. By the time our project was initiated, all the Singapore schools had been provided with Asynchronous Digital Subscriber Line (ADSL) gateway access into SingaporeONE, an ATM network suitable for wideband Internet applications. SingaporeONE offers low-cost user access into a system already designed to distribute video-on-demand (VOD) multimedia services and with bandwidth sufficiently capable of hosting a multi-channel MDVC server. The project takes advantage of the existing infrastructure in the schools and uses CU-SeeMe for video conferencing.

Conferences are carried out on a weekly basis among student teachers and their university supervisors. Each conferencing group consists of up to five student teachers from different schools and one supervisor. The participants see and hear each other in real time, and they share ideas and experiences on aspects of their teaching. Since the launching of the project in May of 1999, three cohorts of 59 student teachers have used MDVC. Summative evaluations to date show that MDVC benefits the users in a number of ways.

MDVC provides an avenue for student teachers to share ideas, problems, and solutions. It enables student teachers to discuss any matters relating to their teaching practice at the time needed and to receive immediate feedback from peers and supervisors. This is particularly important when student teachers experience varying degrees of isolation from their university supervisors and peers. MDVC also provides a channel for student teachers to obtain peer support and encouragement so that there is a reduction in stress for some teacher trainees. More importantly, MDVC breaks down communication barriers between student teachers and supervisors. As a result, student teachers feel more comfortable sharing ideas and discussing problems with their supervisors.

With our most recent cohort of student teachers, we have experimented with including participants' classroom teaching video clips during an MDVC conference. Two student teachers videotaped each other, teaching using a digital video camera. The episodes of teaching consisted of (1) three minutes' introduction to a lesson, and (2) three minutes' conclusion to a lesson. The video clips were put on a password-protected Web site, and the student teachers were instructed to view them prior to the scheduled conference the following day. At the time of the conferences, however, the supervisor chairing the session found that four out of five student teachers had not watched the clips for various reasons. The student teachers were instructed to leave the conference and to return in 20 minutes after viewing the video clips.

This unexpected situation turned out to be helpful for us in understanding the feasibility for such a use of technology. All the student teachers reported easy downloading and convenience of viewing the video clips. It took only about one minute to download a three-minute video clip. They responded positively toward such a new experience and welcomed the opportunities provided in sharing their peers' teaching
using the learning environment of MDVC and the Web. The student teachers expressed the desire to access future use of video clips, and they also suggested the topics on which future video clips should focus.

This development will be further investigated during the next phase of our project, now beginning in Singapore. We will adopt a new version of CU-SeeMe that supports video streaming, MDVC participants will be able to view video clips in real time during a conference.

Conclusion

Our summative evaluations to date support earlier findings that real-time conferencing tends to promote more frank discussion and equal opportunity among participants (Sproull & Kiesler, 1993). In our student teachers’ opinion, a major advantage of MDVC over face-to-face conferences is that MDVC makes it easier “to bring up issues because you feel a safety in distance.” It appears that MDVC represents a less formal medium compared with the formally arranged face-to-face supervisor visits.

Joint knowledge building and expert and peer mentoring made possible by MDVC put student teachers in a meaningful learning context that requires collaborative processing. The student teachers hear and share views relevant to the immediate concerns, and they receive almost instant feedback without waiting for the whole of practice teaching to be over. As the process takes place at a time when they are still doing practice teaching, many of the student teachers are able to try alternative solutions to common problems suggested by peers, and thus learning becomes more meaningful.

There is a definite feeling among all the participating students that they got to know each other and the university supervisor much better than they would otherwise. As one student teacher put it, “I look forward to MDVC sessions because I know I will get encouragement and support from fellow trainees and the lecturer chairing the session.” MDVC may actually enhance trust, perhaps by a process of decontextualizing conferencing by providing an alternative social frame (Goffman, 1974).

To sum up, available data begins to address some of the problems identified in our earlier research regarding the quantity and quality of practice teaching discourse. It is clear that the quantity of discourse is much greater for the student teachers participating in MDVC, mainly due to the removal of the barriers of time and space.

We are focusing our research now on the impact of MDVC on the quality of conference discourse between student teachers and supervisors. Such investigation may help us to understand the impact of electronic communication and collaboration tools on the learning process, and varied patterns of participation, interaction, and reflective processing fostered by these tools (Henri, 1992).

References


