Chapter 56: ePresence Interactive Media and Webforum 2001: An Accidental Case Study on the Use of Webcasting as a VLE for Early Child Development

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1. INTRODUCTION

This chapter presents the use of the ePresence Interactive Media System as a Virtual Learning Environment (VLE) for Webforum 2001[1], a 2-day hybrid event that brought together local and geographically distributed participants to hear presentations on the latest science in early child development. The ePresence VLE supported social interaction and collaboration across time, distance, and space and captured multimedia archives of the event that subsequently led to a number of post-Webforum activities.

Webforum 2001 was the culminating event for an initiative called the Millennium Dialogue on Early Child Development. Planning for this initiative began in 1999 to explore conceptually and technologically innovative ways to educate, empower, enrich, and engage a variety of different stakeholders seeking to advance their understanding of early child development (Matthews & Zijdemans, 2001). Led by Daniel Keating, then at the University of Toronto's Ontario Institute for Studies in Education, in collaboration with Invest in Kids Foundation, and the Lawson Foundation,[2] conceptualization for the Millennium Dialogue grew out of Keating's previous work as director of the Human Development Program at the Canadian Institute for Advanced Research [CIAR][3]. The product of that effort was *Developmental Health and the Wealth of Nations* (Keating & Hertzman, 1999), a collective volume that used socioeconomic gradients to describe the significant association between socioeconomic status (SES) and developmental health.[4] Three major themes had been identified in this research: (i) the wealth of a nation is rooted in the developmental health of its individuals; (ii) enhancing developmental health requires a deep understanding of the core dynamics of human development from a wide range of perspectives, from the biological to society; and (iii) to support developmental health in an era of profound unprecedented transformation, societies must become "learning societies" which actively

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support healthy human development across the population.[5] One of the first tasks for the MDECD planning committee[6] was formalizing these ideas into the following objectives for the project:

> *"to assemble and present the best available scientific work on healthy development; to design and deploy new strategies and means to bring this information to a wide range of audiences who would benefit from this knowledge; and beyond dissemination, to launch a sustainable, interactive dialogue at a societal level on how to make use of our rapidly growing knowledge to optimize the potential for developmental health in all children."*
>
> (Keating, 1999)

The implementation plan involved a number of inter-related activities, including:

- engaging eight internationally renowned scientists from diverse and traditionally separate fields in child development to establish a cross-disciplinary *knowledge base*;
- enlisting a team of researchers and practitioners to assist in the design of a *curriculum* grounded in the knowledge base;
- offering a hybrid face-to-face and online *graduate level course* based on the curriculum;
- creating a distributed conference, *Webforum2001*, a 2-day event originating at OISE/UT to which remote participants would be invited;
- designing and creating new *educational materials* oriented toward diverse audiences.

It was recognized at the outset that achieving the above objectives, in particular the last three, would require a degree of technological innovation. A team of technical experts was assembled to design and implement an infrastructure that would support the project's learning and knowledge building activities. The Education Commons, the in-house technology support group for OISE/UT, determined the overall system and networking requirements, and gathered preliminary information on webcast technologies. Keating had previously used Lotus Notes/Domino, and arrangements were made to upgrade this server and create an intranet/extranet for the project. Knowledge Forum[7], a learning environment developed in-house, was set up for the graduate course. All that remained was to find a team capable of producing MDECD's final event, Webforum 2001, which would be opened up to a large number of participants, both local and remote. The MDECD took a year to plan, a second year to produce, and a third year was spent in post-knowledge media production. Details on the full range of these activities can be found in Zijdemans (2005).

This chapter focuses on Webforum 2001, the 2-day event that used the ePresence Interactive Media System, a webcasting application, to create a VLE to support live interactions among a group of experts and participants, all of whom attended at least part of the event using the VLE. A formal case study had neither been planned nor designed in advance. However, the rich observations gathered over these 2 days supplemented by the systems logs and an informal evaluation, provided insights into how the experience of the participants shaped and was shaped by the affordances of the VLE, as well as the impact of the design choices of the Webforum team in creating the event. This *post hoc* review, while preliminary and exploratory—and now historical—provides the first systematic account of the experience of using the ePresence Interactive Media System in an educational setting to support sustained interaction across several different environments.

We also report here on the unintended consequences of MDECD's decision to use digital technologies, including webcasting. As the event unfolded, the interest expressed by the participants sparked requests for ongoing access to the Webforum content for knowledge building. This included requests for materials to support their programs or projects. The final section of the chapter looks closely at the production of these novel knowledge media and concludes with an example of the Red River College's decision to infuse the new knowledge into an Early Child Education multimedia resource that stands to influence the way in which programs are currently delivered across Canada.

2. WEBFORUM 2001

Keating had been a member of the Knowledge Media Design Institute since it was founded by Baecker and a group of colleagues in 1996. Interested by the potential of knowledge media technologies for knowledge development he invited Moore, then the executive director of KMDI, to participate on the MDECD planning committee.

One of KMDI's areas of specialization was in the human-centered design, development and use of technologies, in particular video technology, to support collaboration over distance. Members of the Institute had worked together on the Ontario Telepresence Project (1992–1995), a research project in which the design and uncovery of novel uses of videoconferencing technologies had been central (Moore, 1997). By the late 1990s, a new class of collaboration technologies was being designed for the internet and accessible from a web browser. In 2000, Baecker and Moore, with long standing research interests in the role of video in supporting distributed work, recognized the potential of one of these IP-based technologies such as webcasting,[8] to reach large audiences at minimal cost in a way that had not been possible with videoconferencing. But as earlier research on video-mediated communication had shown, many of the problems associated with the use of video were social, not technical.

It would be necessary to design and build a webcasting system, grounded in principles of human-centered design. Bell University Laboratories supported this research and the first version of the system, known as ePresence, went live in the fall of 2000.

The progress of this project was watched with interest by the Millennium Dialogue committee as they still did not have a solution for managing the distributed part of their program. Initial enquiries into the cost of commercial webcast productions yielded estimates ranging from $60,000 to over $120,000—well beyond the capacity of the MDECD budget. Following the successful use of ePresence for the KMDI lecture series in the spring of 2001, the technology seemed mature enough for both the Millennium planning committee and KMDI to collaborate on exploring the use of this first version of ePresence as a VLE for the closing event, Webforum 2001. For ePresence this represented an opportunity to capitalize on the experiential learning that had taken place in the spring series, and for the design team to gain further insights into the use of the system in a real world setting.

In the summer of 2001, KMDI's ePresence team was contracted to webcast the Webforum event. The ePresence team worked closely with the Webforum team to plan and prepare for the production. KMDI's ePresence Interactive Media team was in many ways an ideal partner for Webforum 2001. Both MDECD and ePresence were innovative university-based projects. The MDECD framework for designing a learning society was theoretically well conceptualized. The ePresence Interactive Media team came out of many years of research experience in the design and use of synchronous or real-time collaboration environments to support distributed interaction, in particular, how to support the engagement of participants whose experience of the event would be mediated by technology.

In early October 2001, the Webforum team sent out approximately 300 papers and electronic invitations to a diverse group of stakeholders with interest in the area of early child development. This included members of the local community who were invited to participate in the event at OISE/UT and Faculties of Education and Early Child Education across Canada who were invited to participate using the ePresence Interactive Media VLE. The participants were therefore self-selected based on their interest in the subject. Those attending remotely were informed of the public and exploratory nature of the event and consent was sought in advance to publishing their names on the public Webforum web site.

On November 8–9, 2001, some 155 people attended Webforum 2001 at OISE/UT and 40 attended *via* the internet. The event was comprised of two related sets of activities—a series of four presentations followed by question periods and a series of three roundtable discussions. Each morning and afternoon there were two presentations, each given by one of the senior scientists, followed by a question period. After a short break, a roundtable discussion was convened. The only exception to this pattern was on the second day which

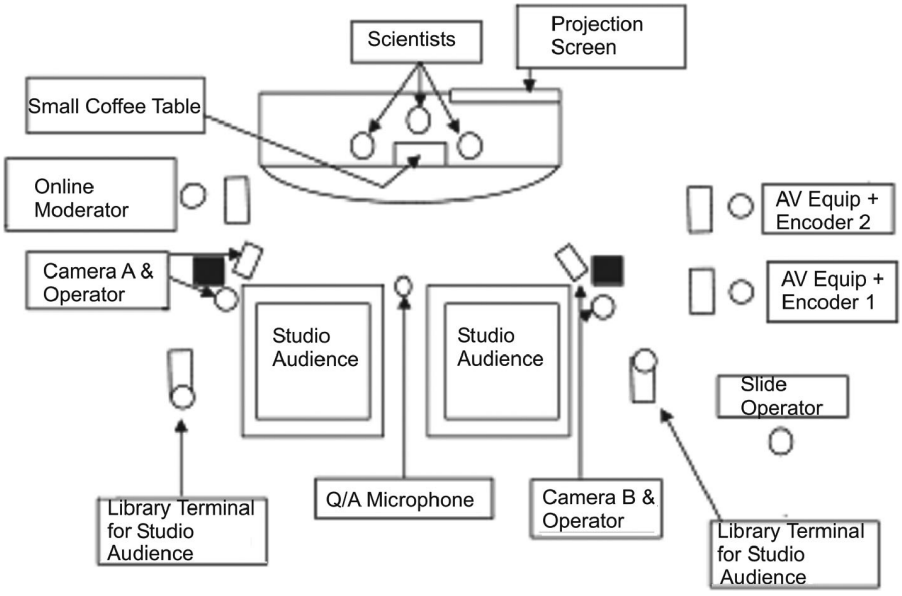

Figure 1. Webforum 2001 configuration OISE/UT library.

ended early after the last presentation and question period. All the presentations and questions periods were held in the OISE/UT library and all the roundtables were held in a conference room two floors above the library.

Figure 1 shows the configuration for the library location.

Figure 2 shows the configuration of the separate roundtable discussion conference room.

Attendance at the roundtables was restricted to the senior scientists and respondents, and the discussions were broadcast simultaneously to both the local participants in the OISE/UT library—who viewed them on a large screen—and the geographically remote participants—who were either alone, or watching as part of a group. If a member of the library audience wished to ask a question, two computers open to the ePresence interface were available, but there was neither a moderator nor any assistance provided. The local audience at OISE/UT, therefore, actually participated in the event in two different ways—in a face-to face setting and as members of a remote audience. The significance of this decision to have the local audience participate remotely for part of the event would only be evident later.

3. ePRESENCE INTERACTIVE MEDIA

The ePresence VLE supported this hybrid local/remote audience and made it possible for the all the participants to be part of this 2-day dialogue with

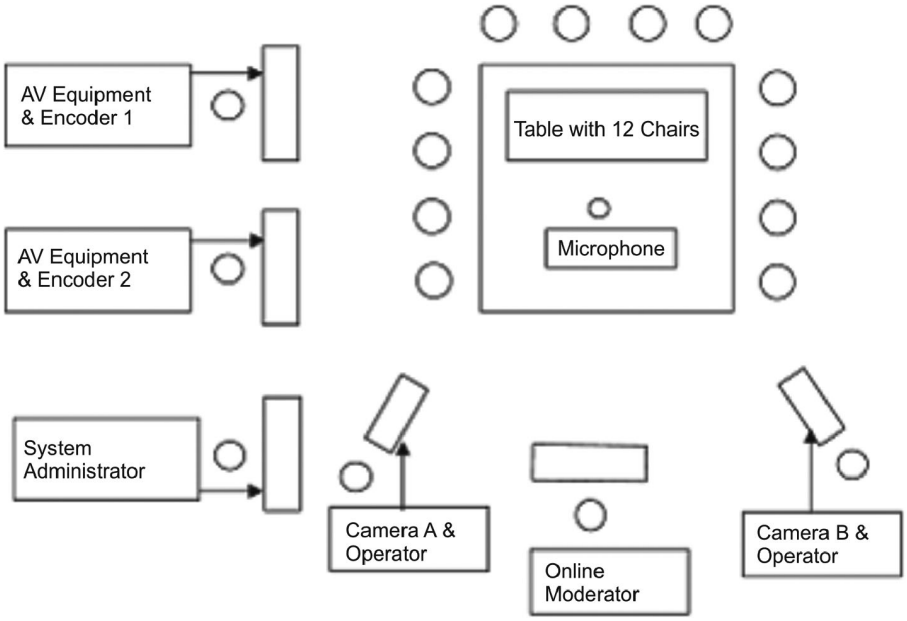

Figure 2. Webforum 2001 configuration roundtable conference room.

the eight internationally renowned scientists. At the time of Webforum, webcasting was typically non-interactive as there was a significant time delay of several seconds before an image generated at the source would be received at the remote end. The ePresence Interactive Media was a live webcasting system to which a number of innovative features had been added to overcome some of the limitations of the currently available commercial systems. For example, ePresence employed text chat as a mechanism allowing interaction among remote participants, and between these individuals and the presenter *via* a local moderator. Remote participants could ask questions and review the material already presented by the speaker. As long as the audio–video capture of the event was done with attention to media production values, ePresence had the potential to provide a rich and engaging multimedia experience for viewers.

For this event, the ePresence system was equipped to sustain 60 licenses for simultaneous use and supported streams at 300 kbps for LAN/WAN, and 56 kbps for modem. The 60-license limit was due to financial restrictions and not system capacity. Precautions were taken such as using an offsite mirror server to offset potential access and bottleneck limitations and setting up an audio only server so that minimally audio, slides, and interactivity would always be available. Additional bandwidth was also purchased. Finally the system was implemented prior to the event both for testing purposes and to provide support for registered remote participants interested in trying out the technology in advance.

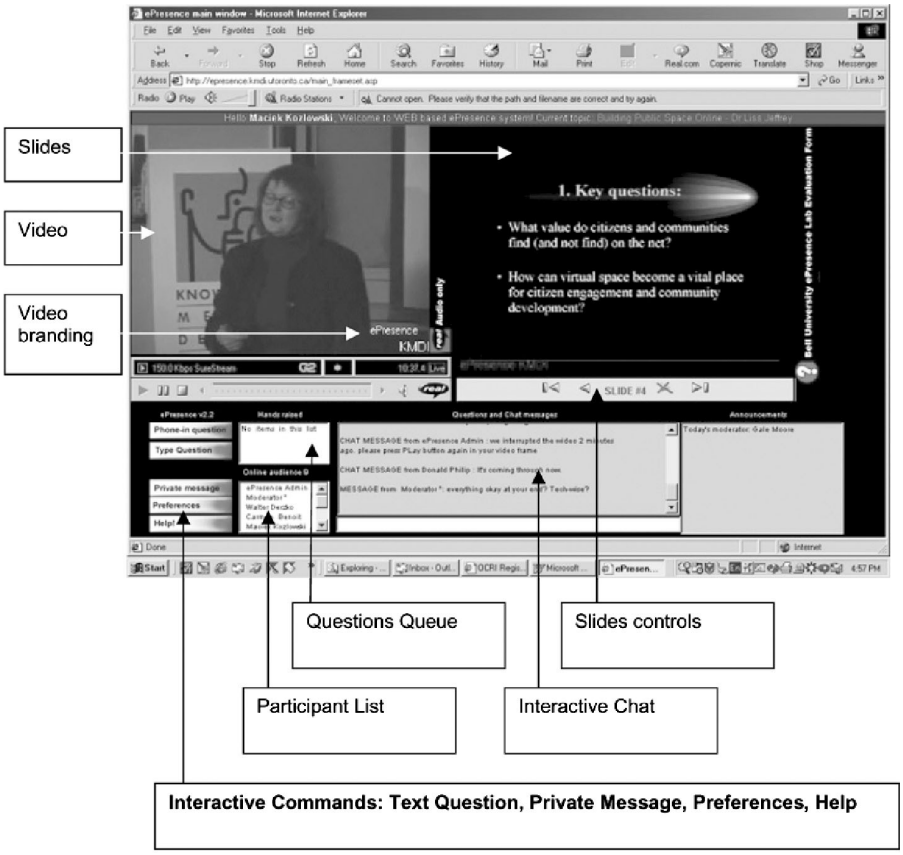

Figure 3. ePresence live Webcast user interface.

Figure 3 is a screen capture of the user interface as seen by the remote participants.

The ePresence live interface included the following features:

- a window for a panel or an individual speaker;
- a window for slides or presentation notes;
- a text entry window for submitting private text questions directly to the moderator and/or public and private postings using a chat feature through which participants could interact with each other;
- help and the display of number of participants on line.

An ePresence webcast, at the time, required a five-person crew to operate the two cameras and two encoders, and to operate the slides[9]. In addition, two moderators and the system administrator were available to the remote participants to answer questions and to assist with any technical problems. Moderator One was stationed in the library and engaged directly with the

online participants flagging questions for Moderator Two who was the conference convenor. Moderator Two had the complex task of presenting a paper on Day 2 as well as conveying the online questions to the participants and scientists. In this role he provided the bridge linking the face-to-face and remote participants by bringing the online questions and commentary to the local presenters and library audience.

4. AN ACCIDENTAL CASE STUDY

Moore coined the term "accidental case study" to describe this paper as at the outset a formal case study had neither been planned nor designed. However, as the event unfolded, it was clear that there were a number of valuable, albeit preliminary, insights into the complexities inherent in designing both the technical application to support distributed communication *and* the design of the event that should be reported. First, webcasting was still a relatively new application and most people had limited experience with using such a system. The 2-day event, while short, did provide some time for participants to learn to use the system. In addition, it could provide insights into the nature of the support needed by participants from both the ePresence team and the Webforum team. And, the decision by the Webforum team to hold the roundtables in a small room that accommodated only the scientists and other senior scholars provided a unique opportunity to observe the experience of using the same technology in two distinctly different social conditions.

The geographically remote participants experienced no change when the event shifted from the presentation sessions to the roundtables, but the local participants who were present at the sessions had no alternative but to participate remotely during the roundtables. Finally, the spontaneous response from participants that took place immediately following Webforum revealed unintended consequences of the webcast, seeded both technical and social innovation, and provided insights into ways to support the emergence of future communities of learning.

5. INFORMATION GATHERED

A variety of information and data were gathered over the 2-day Webforum 2001 event. These came from a range of sources including registration information—which included such things as the participants' affiliations and online participants' locations, and technical notes developed during the planning period leading up to the event. In addition, the ePresence system automatically generated a log of the online interactions. At the end of the event, forms had been distributed to each of the participants who expressed an interest in gaining access to an archive of the event, which also included a brief

Table 1. Remote participants by location

WF2001 Participants: by Location	Webcast Participants
Canada	
Nova Scotia	2
Prince Edward Island	1
New Brunswick	1
Quebec	3
Ontario	4
Greater Toronto Area	16
Manitoba	4
Saskatchewan	2
Alberta	3
British Columbia	1
U.S.A	
New York	1
Minnesota	1
San Francisco	1
Total	40

evaluation of the event. Finally, following the event, e-mail was received from a number of the participants who had attended both at OISE/UT and remotely.

5.1. Participants

The registration records provided information on the distribution of the participants attending the Webforum by their geographical location and employment sector. Table 1 shows the geographic locations of the 40 remote sites.

The remote sites were located all in North America with the majority (16) located in the greater Toronto area. Seven of the Toronto sites were individuals accessing the event from their offices at the UT and two were from OISE/UT computer labs on the 3rd floor. These labs were opened up informally so that members of the OISE/UT community could attend at no cost. The international locations included New York, Minnesota, and San Francisco.

A total of 195 participants were involved in Webforum 2001 (Table 2). The largest single group was in education (58), which included researchers, educators, faculty, graduate students, and teacher federations. The second largest were representatives from organizations related to early child development (47), and government groups or individuals (24).

The geographically remote participants that is those not present at OISE/UT, attended the event in two ways—either as individuals or in groups. Table 3 shows that over the 2 days, a total of 48 participants were individuals accessing the event from their personal computers at home or at the office.

Table 2. Participants by employment sector

WF2001 Participants: by Sector	Library OISE/UT	Geographically Remote	Total
Education (universities and colleges, K-12, teachers federations, schools)	45	20	65
Private and public associations/ organizations	44	3	47
Health (doctors, nurses)	11	0	11
Government	17	7	24
Technology	6	9	15
Private foundations	17	0	17
News media	10	0	10
Other	5	1	6
Total	155	40	195

On each of the 2 days of the conference, 23 were groups at least 10 of which were comprised of between 4 and 20 people.

Although no data were formally collected on the remote groups, we learned that the groups were in a large room equipped with a single projector and in at least four cases they were integrating the Webforum event into their own parallel sessions or seminars related to early child development. Each group also had a moderator who was responsible for conveying questions or other comments to the ePresence moderator. The geographically remote participants thus had an advantage over the OISE/UT group attending the roundtables remotely. A total of 37 sites logged in on Day 1 with a maximum of 25 people logged in simultaneously. On Day 2, a total of 33 sites logged in with a maximum login at any one time reaching 20.

5.2. Interaction at the Event—Remote and Local

As previously mentioned, the local OISE/UT participants attended from the library location in two ways—face-to-face for the presentations and question

Table 3. Webforum 2001 login details

WF2001 Login Details	Day 1	Day 2
Number of groups	13	10
Number of individuals	25	23
Total number of sites logged in	37	33
Max login at any time	25	20

Table 4. Face-to-face versus online questions

	Day 1	Day 2	Total
Questions asked face-to-face OISE/UT local (presentations)	33	39	72
Questions asked Online OISE/UT remote (roundtables)	3	6	9
Geographically remote (includes presentations and roundtables)	10	10	20
Total	46	55	101

periods and remotely for the roundtable discussions. Table 4 shows that there is a much higher level of interaction when attendees are participating in a live event. In both cases, when the participants were remote there was less interaction.

On Day 1 a total of 13 of the total 46 questions were submitted using ePresence and on Day 2 this increased to 16 of the 55 questions posed. A total of 101 questions were asked over the 2-day period. It is important to note that the majority of all the questions came from the scientists who were participating in all the events and around whom Webforum was designed. It is interesting to note that the lowest level of interaction was from the participants at OISE/UT when they attended the roundtables remotely.

There were two moderators at OISE/UT, and both were present in the live presentations. Moderator One monitored all of the questions from the remote participants and flagged them for Moderator Two, who also had ePresence open on his laptop browser. However, as he was also convening the live events, he could not attend fully to the remote queries. An important role of the moderators was to ensure that the online questions were brought before the live presenters, but on a number of occasions the geographically remote participants had to be assertive about getting their questions through. There were clearly some experienced users of collaboration technologies in the remote audience. In fact, some had used other technologies such as videoconferencing and were more experienced with participating in distance events than the moderators at OISE/UT. The following request illustrates this: *"Can I suggest that questions from distance participants be interspersed with those from the floor? When we do paediatric Grand Rounds involving several centres in the Maritimes, we try to give equal time to all centres to eliminate the perception that they are peripheral."*

In addition to the official moderators, the conference co-ordinator was also monitoring the event and providing support to the remote participants. The need for the moderators to work together to assure that remote participants were not dis-enfranchised was made clear when group from Nova Scotia who had submitted a question but had not heard it reflected in the live broadcast.

They asked Moderator One: *"I do not see the Roundtable room on my online list anymore—could you or the conference coordinator pass our question on to the Emcee [sic convenor] for us? Please and Thanks"*

This question sparked a series of messages among the moderators and as the following exchange illustrates, shows how private messaging was extremely useful as a back channel to co-ordinate without disrupting the event in progress. The conference moderator privately messages Moderator One: *"Hey there, are you taking care of the Nova Scotia request?"* Meanwhile the Nova Scotia Group who was still waiting posts: *"appreciate any effort."* Moderator One responds privately to the conference moderator: *"Just working on it."* Moderator One then sends a private message to Moderator Two, the convenor: *"Check out the Nova Scotia group message just below my last announcement."* Moderator Two responds privately to Moderator One: *"Got it. Thanks"* At this point Moderator Two announces to the library audience: *"This question came in from one of our remote sites in Nova Scotia . . . "* Moderator One then sends a public post to the Nova Scotia Group: *"Sorry to have missed this on the first go-round!"* The Nova Scotia Group replies: *"No problem-we have the question being answered now! Thanks to all who helped get the question out—Un gros merci!"*

Both of the above examples highlight some of the inherent challenges in trying to ensure that the remote participants were remembered and brought into the face-to-face situation. Overall, the ePresence VLE worked well and had the affordances to support a variety of social interactions. The remote participants engaged easily and were able to have their concerns addressed.

5.3. The Content of Online Interaction

While the local OISE/UT audience could interact directly with the speakers during the presentations, their interactions outside of the formal sessions were primarily with others who were also attending. For the individuals and groups who attended remotely it was necessary to ask questions through the moderator, but they could also interact with all the others online, regardless of their location.

The transcripts generated by the system at this time, included both the public and the private messages. Given our interest in constructivist learning, we were interested in looking at all the messages exchanged for evidence of active learning and engagement. We felt, however, that in spite of the fact that a notice had been posted publicly that all the chat was logged, it was inappropriate to use the private chat transcripts without explicit agreement by those involved, as the implications of the system logs may not have been fully understood. The public dialogue and questions were, on the other hand, public and available to everyone online.

The private chat had originally been included in the application as a way of allowing remote participants to "whisper" to each other—a social behavior that had been observed in studies of live audiences attending public lectures or talks. It also turned out to be a convenient way for people to communicate with the moderator if they were having technical problems without disrupting others online. Furthermore, it provides an excellent back channel for co-ordinating the activities of the technical and administrative team members. However, as the meaning of "private chat" is likely to be interpreted differently in different social settings and in different groups, this was flagged as an important issue to be addressed in the future. In this paper, private messages are, with one exception, excluded unless they are exchanges among members of the administrative and the technical teams associated with co-ordination or impersonal administrative, or technical exchanges with the moderators. The one exception is below in the section on sociability and involves an exchange between a mother and her son who were in different locations and both attending remotely.

A qualitative review of the chat messages uncovered the following four categories: (i) substantive; (ii) technical; iii) sociability; and (iv) administrative. Each of the categories is described below and illustrated with quotes from the logs.

5.3.1. Substantive: Content Related to the Subject Matter of the Conference

These postings were on the subject of the event and are suggestive of the remote participants' engagement in the event. These messages were of two types—the most frequent was questions to the speaker, as the following quotes illustrates: *"How might we work differently in the research and policy areas, if we think "symphonic causation" as compared to "multiple causation" or similar terms?"* Less frequent was a general comment that was not directed to anyone in particular, but which could be seen by other members of the remote audience. In one case, a local participant in the OISE/UT library used one of the ePresence terminals to post a substantial stream of thoughts that otherwise would have been difficult to raise in the face-to-face meeting.

5.3.2. Technical: Content Related to the Technical Aspects of the System

These postings were typically those related to technical issues and included troubleshooting, concerns about incorrect slide synchronization, or screen resolution problems. Today, technical problems are virtually non-existent, but this was both early days in the development of the ePresence application, and with participants who as yet had only limited experience with webcasting technology.

The ePresence team had worked to prevent some of these issues by providing a system wizard that checked systems requirements when people initially set up their accounts. In addition to this, the Webforum team had hosted a test day, a weekday in advance of the event so that remote participants could test their systems. Despite this, numerous issues arose particularly on the first day. There were frequent interactions between the moderators, system administrator, and remote participants to help troubleshoot "on the fly". In the following excerpt, a participant sends a private message to the Administrator: *"Not the right slides."* Moderator One responds privately to the participant: *"We're working on it, please bear with us."* The administrator fixes the problem and instructs the participant how to adjust his computer settings to get things working properly: *"In your browser please set up and select Tools—Internet Options—Temp Files—Settings—Every visit to the page."* A few minutes later the participant responds: *"Thanks I have the slides now!"*

Other technical related postings reflected the frustrations the remote participants were experiencing due to the numerous technical glitches. Not surprisingly, this was most evident on the first day when everyone was unfamiliar with the application. One participant group sums up their experience this way: *"We're doing fine but finding the technology a little frustrating at times. Online we are missing many of the cues we would have in a live audience. It is a different experience and we must change the way we attend to the lecture. One problem is that if there are any technical difficulties such as sound problems we must break concentration to attend to them. For example, while adjusting volume it is hard to keep 100% attention especially if the participants in our room need to talk to each other about the problem. By having your speakers think about their distant audience they may be able to help with some of these problems. Having the slides available ahead of time as we mentioned this morning is a good example. Also a little more time spent summarizing or reviewing would help keep us in the loop. I think I have a somewhat better idea of what an ESL learner feels like when I follow a lecture in this format. Thanks."*

As comments went back and forth between the moderators, administrator, and remote participants it was interesting to note that gradually as the remote participants became familiar with the technology, they too started assisting others. A participant from Halifax notes that the slides on her computer screen were the wrong size saying: *"The size of the windows exceeds the size of the screen and I have to scroll to see different windows. Can the entire display be shrunk to fit the screen?"* A person from the computer lab tries to assist: *"Halifax, set the resolution on your monitor to 1024 × 768. That should help. In the control panel, if you have a Mac."* The administrator adds: *"Unfortunately you have to have a screen resolution of at least 1024 × 768 to see everything onscreen without scrolling."* The Halifax participant responds: *"That's what the resolution is set to."* A few minutes later the group from Manitoba posts:

"The setting on a PC need to be the same for resolution and desktop in your video card settings."

The next series of exchanges captures the experience of the members of the ePresence team and Webforum team who were located in the OISE/UT library and simultaneously monitoring the remote participants *via* computer. The time delay between the live broadcast when it is received remotely is small, but still significant. It is transparent to the remote audience who is always 10 seconds late, but the experience for the moderator operating in two time zones is complex and led to an interesting discovery about the technology. A member of the research team asks: *"Would anyone be able to tell me the exact time delay between live and web?*" The conference moderator privately responds: *"What we see live is not the same as the online. I know it looks strange but they [remote participants] don't notice anything."* Moderator One uses the chat to say: "*It seems to vary from machine to machine, but maybe, on average, 1 minute?"* The computer lab then creates a message: "*Seems more like 28 seconds."* Concerned that they might be distracting the other remote participants the conference moderator creates a private message to Moderator One: *"I sent a private message stating that for the online group it looks normal. It's only for us who are seeing both the live event and the webcast simultaneously that it appears out of sync."*

This interaction was one of numerous instances where messages were exchanged and suggest that moderating the event was also a learning experience for the research team.

5.3.3. Sociability

Sociability was used to categorize the postings that involved more casual banter such as: *"Good morning everyone, you're early"*, when participants started logging on before the webcast or, the following response to one remote participant who was encouraging us about the success of the event. The conference moderator responds: *"Thanks for the encouraging words. It has been a bit bumpy for some but generally I think a good experience."*

An interesting and serendipitous series of exchanges took place between a mother and her son who were both attending the event remotely—one in New Brunswick Canada, and one in New York City. The following excerpt captures their interactions as they used various parts of the ePresence message features. It is interesting to observe the relatively fluid movement between public and private conversations. They also reported that they were simultaneously maintaining a series of face-to-face exchanges with people in their location. We would like to think that this is a reflection of the human-centered approach taken to system design: Private message from participant 1 in New York: *"Hi Mom! How's it going? I just tuned in."* Participant 2 in

New Brunswick responds: *"Great. Interesting dialogue."* Participant 2 then submits a text question to the presenter using the ePresence text question feature: *"Could you comment on parenting courses and their effectiveness. What works? How important is it to provide individual help and supports for family?"* A few minutes later Moderator Two, the conference convenor poses the question face-to-face to the presenter: "*. . . this is another question from New Brunswick*: *"Could you comment on parenting courses and their effectiveness. What works? How important is it to provide individual help and supports for family?"*

At the end of the presentation some 10 minutes later the participant 2 asks: *"Hi. What did you think of it?"* The event stops for a break between sessions and the audience is told that the next presentation will resume in 20 minutes. Just before the presentation starts participant 2 comes back online. She asks participant 1: *"Are we back on yet?"* Participant 1 responds: *"Hi Mom—All I see is the sidewalk outside of OISE . . . Hey, there's [the conference convenor]. Guess we're back on!"* Participant 2: *"This is just so fascinating and so much fun. What is your impression?"* Participant 1 responds: *"It is very cool. Part of the problem that I've had is being able to dedicate myself to the conference. One good thing about going away is that you are away from work (no student's knocking on your door!)"* Participant 2 responds: *"I know. Same with me. At least this will be archived . . . He sure speaks quickly. Doesn't even take a breath."* Participant 1 replies: *"You can say more that way!"* Participant 2 asks: *"Who is this fellow? Do you have a comment or question?"* Participant 1 responds: *"Sir Michael Rutter. I feel like I haven't been paying close enough attention to ask a good question. (Mine would have to be about the research.)*" Participant 2: *". . . I think these researchers are more interested in their research than the application or even involvement and reciprocity with other stakeholders or sectors."* Participant 1 responds: *"Well, yeah. But it is also what they know. You should ask application questions—that was part of the mandate of the conference."* Participant 2: *"OK, that makes sense."*

This exchange shows the continuity of the personal conversation, but it also points to the issues about multitasking and the cognitive overhead that are involved in participating in multiple conversations at different levels in a short period of time. It further raises an important point about how the event was organized and draws attention to the importance of communicating the goal of the event clearly to the participants in advance. In this case, the focus on the scientists was planned from the start, but opening up the event may have in the past sent a mixed signal, and as we saw with the local participants excluded from the roundtables, an unintended social disconnect. Further, it is not clear the extent to which the scientists were prepped to consider the remote audience. From their position, without access to the ePresence application, this remote audience was essentially invisible.

5.3.4. Administrative

Administrative postings were the most common and included instruction and information from the ePresence Administrator to update the remote participants and facilitate their involvement. For example: "*To all our on-line participants: we are trying to reserve the "All Questions" feature for concise content questions to be addressed to speakers or scientists in general. Please feel free to experiment and let the general chat lead you where it may. We'll be ready to go in ∼5 minutes.*"

Participants became engaged and offered a variety of advice to the administrative and technical team. A member of the Education Commons had a suggestion for the videographer: *"Might I suggest the back camera pull back on [the conference convenor] to give a "Montel Williams" feel. We would like to see a bit of the audience."* A remote participant site from Victoria, British Columbia also had some views on how the first roundtable session was being conducted as seen in this comment: "*Can we ask that the Clyde Hertzmans [respondent for the first roundtable session] of the process to be more focused and perhaps answer one issue at a time and have the panel respond rather than addressing every issue in "one" speech. I think the points made would be retained and commented on in a more effective process."* This suggestion was in fact successfully relayed and taken up in the subsequent roundtable as witnessed when the respondent of the second roundtable states: *"So I thought what we'd do is just break up the questions a little bit more because it was hard I think to remember all of them when Clyde went though them."*

On a number of occasions, members of the research team who were also monitoring the event used the private message feature to address the issue of integrating the remote audience more fully into the live event. In this interaction, a senior member of the ePresence research group, located elsewhere on campus, has dropped in remotely during a roundtable discussion to see how things are going. He shares his thoughts with the conference co-ordinator on how the live group was not integrating or aware enough of the online participants: *"I've only listened in sporadically, but there seems to be little attempt to engage either a local or remote audience in the dialogue. Will this happen later?"* The conference co-ordinator responds: *". . . I think this will hopefully come in the question period at the end. As for here in the library there are not many getting up to use the public terminals. I think I will ask Moderator Two if he can keep trying to encourage people, maybe they are shy or intimidated."* The researcher replies: "*I may be wrong but it looks like the problem is not with the remote attendees, but that the panel is so involved in their discussion and no one else is being let in. Sorry, must leave now."* The conference co-ordinator follows up by sending a private message to Moderator One about conveying this message. Moderator One then sends a private message to Moderator Two

Table 5. Breakdown of posted messages

	Day 1 Total	Day 1%	Day 2 Total	Day 2%
Subject related	23	5%	63	21%
Technical	264	62%	87	29%
Sociability	54	13%	101	33%
Admin	86	20%	53	17%
	427	100%	304	100%

saying: "*Can you remind the studio audience and the on-line participants to feel free to type in questions at any point in the Roundtable"* A few minutes later Moderator One tries again as Moderator Two is clearly engrossed in the discussion: *"Hi [convenor] we should try to get some online questions on the table and introduce them verbally as such so that the participants will feel their issues are being addressed."* Moderator Two eventually responds: *"Will do."*

This theme of bridging the remote and face-to-face participants, either through providing instructions for getting questions ready for the presenters or discussing how to enhance the experience for the remote participants to make them feel more included, is a common through-line across the administrative postings.

Table 5 provides a breakdown of the 731 messages that were posted during the 2-day webcast. There were 427 messages on Day 1 and 304 messages on Day 2.

Of particular interest were the increases in the percentage of messages in the category of substantive messages from an average of 5% on Day 1 to 21% on Day 2, and Sociability messages from 13% on Day 1 to 33% on Day 2. Decreases were found in Technical messages from 62% on Day 1 to 29% on Day 2 and Administrative messages from 20% on Day 1 to 17% on Day 2.

5.4. Participant Response and Input

There was no formal evaluation of the event. However, from the outset, there had been a plan to create some sort of archive of the Webforum that participants and others could access. On the last day, the participants at OISE/UT were told that an archive of the event would be available online, and that they needed to sign up to indicate their interest in accessing this. This form about the archives included a brief evaluation on the event itself. Participants were asked to rate their responses on a scale of 1 (poor) to 10 (excellent): "Overall was it a useful experience for you?" Of the 37 forms that were submitted, a total of 27 people filled out the evaluation component. Table 6 shows their responses.

Table 6. Webforum 2001 questionnaire results (N = 27)

1 (poor) to 6	Percentage of responses
7	8%
8	20%
9	24%
10 (excellent)	48%

Several people responded to the request for "other comments". Responses were generally positive about the event at OISE/UT: *"First-rate planning, eminent speakers, friendly venue. Archives, especially access to video, papers, and slides would be good."* But it was clear that these participants did not like having to view the roundtables as remote participants: *"The roundtable might have been easier to follow if it were in front of an audience."* In light of the positive experiences reported by the geographically remote participants as we will see below, we expect that the negative response of the local audience was less a reflection of the technology *per se* and more indicative of what might be described as a breakdown of an implicit social contract when the social norms of face-to-face conference participation were suddenly replaced by a technologically mediated experience—something that they had not signed up for. Furthermore, it cannot have helped that the roundtables included only the international scientists and a small group of senior scholars/respondents. The participants at OISE/UT were both simultaneously "present" and "absent" at the event in a way that those who were geographically distant did not experience.

As the geographically remote participants already had created user accounts in order to use ePresence, they automatically had access to the proposed archives and therefore did not receive the above form. However, immediately following the final presentation a number of participants responded generally very positively and saw the use of the VLE as an opportunity. They provided helpful suggestions for improving the experience and encouragement for the continuing this line of research: *. . . It's a great way to hold a conference and I'm sure it will become widespread once the technology becomes more transparent to the end user. Day 2 at home on a cable modem, the video quality was just as good as the high speed network at the university. It would be nice to have a little more resolution in the slides since they often convey fine detail. But I was able to print selected slides, which is very nice. Microphone input so one can ask questions orally instead of in print would be a nice advance as well. I imagine this takes lots of bandwidth and adds another layer of complexity. Please consider phone support in future WebCasts to help end-users who can't logon during a session. Keep up the good work!! . . . a researcher in Nova Scotia.*

The key I think is to ensure sound and overheads are working well. ~At times the overheads lag behind. ~Another problem is small font size on overheads. They can be a challenge to read. When you have to concentrate on small things like that it can be hard to pay attention to what are often difficult concepts coming fast. It would be very helpful to have the overheads ahead of time so we can print for reference and notes. Just another thought to fine tune: When a speaker is finished her/his presentation the final slide is left up. It would be nice if it could be replaced or removed. You may want to replace with a title slide or something to set the context of what is happening. If nothing else you could replace with one of those babies from earlier today. . . . a satellite group in Manitoba.

In the days following the event, additional unsolicited comments came in *via* e-mail from both the OISE/UT and remote attendees: *Congratulations on an amazing undertaking. Thank you so much for the opportunity to join The Millennium Dialogue events. If you would be so good as to forward me any materials you have on the event itself—and, when you have options for purchase of the program, please provide those details as well, as we'd like to promote it to our audience of 5,000 perinatal professionals across North America . . . Once again—thanks. I trust you feel most gratified (although exhausted!) . . . a media representative.*

I found the Webcast very thought provoking. I'm anxious to view the final presentation. I felt like somewhat of a pioneer as a participant of the Webcast experience itself. The wonders of technology! . . . a participant from Manitoba.

We were interested not only to receive such positive input but also to see the number of comments that referred to having access to the post-event archives for ongoing professional development: *A million congratulations on successfully staging the Webcast conference. We watched during the two-day event . . . We plan to Re-broadcast at least one of the presentations and hold our own roundtable discussion in the first week of December. Many thanks again for all your assistance enabling us to be part of the history-making Webforum 2001 . . . a remote participant located at the University of Victoria, British Columbia.*

Congratulations on the MDC Webcast—what a concept! I wasn't able to be online for the whole thing, given the time difference and other commitments but now plan to indulge myself in the archives. What I saw/heard was so stimulating and this is a fantastic way to get the word out. I'd also like to run emerging thoughts about the course I'm doing around MDECD by you. . . . an educator at the University of British Columbia.

What a wonderful gathering! Many thanks for including me. I am eager to revisit the Dialogue archives website, but I think I need a password. Can you give me directions? . . . a government consultant.

This was excellent and worked so well. Thank you so much for all your efforts and the opportunity to be involved. I am sure we will use the archives and we will contact you. . . . a remote group in Prince Edward Island.

6. POST-EVENT: UNANTICIPATED CONSEQUENCES

6.1. Webforum Archives

At the time of Webforum 2001 an online archive system was not part of the ePresence application. The practice up to this time had been to produce a VHS of each production so that the content was not lost. Early in the planning period, however, Videotelephony—who had been involved with ePresence—had raised the idea of creating an online archive. The overwhelming support for the Webforum event and interest expressed in gaining access to materials for ongoing use encouraged us to pursue this idea of developing knowledge media products to promote and support an ongoing culture for learning and knowledge distribution. KMDI's ePresence team set up a Webforum Archive and Videotelephony continued to partner with the conference co-ordinator on planning and preparation during this post-event knowledge media production period.

While demand for an archive was high from the local and remote participants, the most persistent requests came from the Australian contingent. A number of groups and individuals in Australia had registered for Webforum, however a combination of technical difficulties and the time difference prevented them from attending the event live. As the following illustrates: *"Not sure if you got my previous email—technical difficulties here. I couldn't participate in the live online forum but am keen to access archives if that's possible. Can you please let me know about this?"*

The archive interface in the first iteration, seen in the screen capture, offered the similar features to the live broadcast interface (Figure 4).

The key difference in the archive interface was an additional eResource Library slide on the right side, which provided access to related materials and allowed users to toggle between either a live chat window in the bottom frame and or a public threaded discussion. In this respect individuals and groups could interact either synchronously or asynchronously around the archived event. The turn around time to create these archives from the live capture was approximately 3–5 days and the archives were available online for a temporary period of 4 weeks while we planned for a more permanent knowledge media product. Towards the end of this period we received the following e-mail from a professor in Newcastle Australia: *"Hi, unfortunately I wasn't able to access these [archives] before the middle of December because of problems at our end with the firewall slots, and over the weekend our internet access has been down. However, what I was able to log into, which was the first day, was fantastic. Is there any hope of (a) either extending the period during which access to the archives is possible or (b) getting a CD-ROM of the proceedings? I've missed William Boyce, Richard Tremblay, Alicia Lieberman, and Dan's summing up which I desperately wanted to hear. It's been a great resource—congratulations to all*

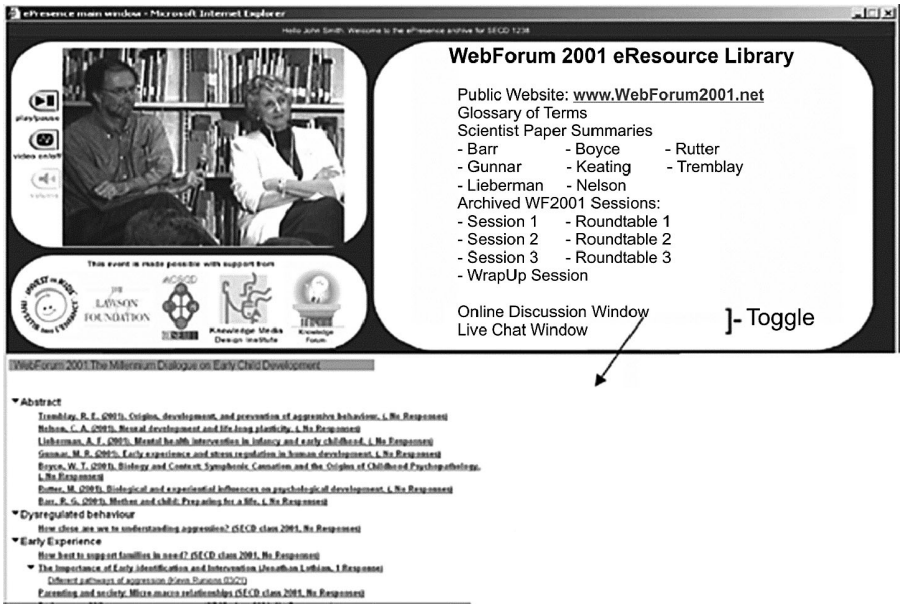

Figure 4. Webforum archive user interface.

of you for enabling those of us far away to be voyeurs on such a fantastic workshop."

No systematic data are available on the use of the archives, however, in at least five cases participants informed us of their use of the Webforum content for separate events, seminars, and courses.

6.2. Conversations on Society and Child Development (CSCD)

A significant use of the ePresence archive was as the basis for the creation of a knowledge base for *Conversations on Society & Child Development*, an interactive eResource which uses compact disk [CD] and web technologies and which was designed to support a VLE for accessing the knowledge and supporting exchange among those who generate research and those who want to apply the findings.

CSCD was developed with VideoTelephony Inc. and Graphix-Design in Ottawa as a series of four CDs. Each compact disk contains the video and synchronized slides of two scientists, paper summaries of the talk, other supporting materials and references, the audio of the post-presentation question periods, and the roundtable discussions. In addition to this, the resource was designed to link to a flexible tailor-made VLE for ongoing interaction, collaboration, and resource sharing. The vision for this web interface was to

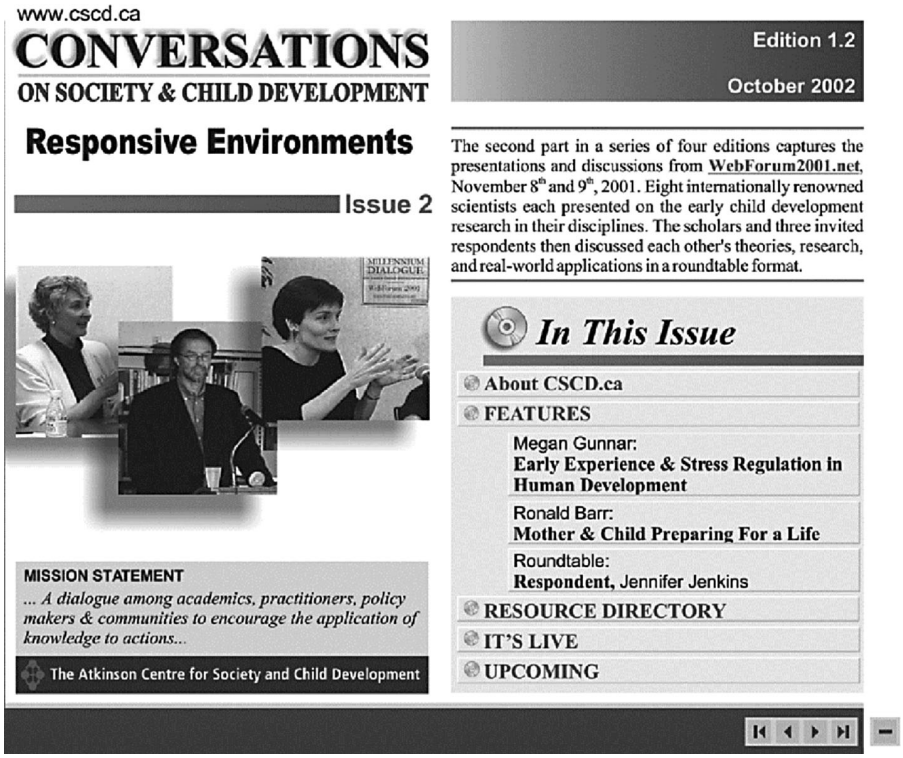

Figure 5. CSCD V1.2 front page.

facilitate the use of CSCD for professional development, seminars, or as a class resource. Figure 5 shows the first page of CSCD Edition 1.2. On the right side under "In This Issue", interactive buttons take the user to each section of the issue. Alternatively, users can use the buttons in the bottom right corner to scroll through each individual page.

Tables 7 and 8 provide summary information on the post-event archive and CSCD users by location and employment sector.

In both the Webforum archive registrants and the CSCD subscribers the largest group is academic—faculty, researchers, practitioners (83). The second and third largest are, respectively, organizations and government agencies who are working in some aspect of early child development. We see that similar to the Webforum live participant group, users of the archives and CSCD represent a diverse range such as university and college faculty, Human Resources Development Canada, psychologists, clinicians, researchers, child care workers, policy workers, and other groups or organizations working in the field of early child development.

Table 8 shows the distribution of the participants by geographic location.

Table 7. Post-event knowledge media participants by employment sector

Number of Participants: by Occupation	Webforum Archive Registrants	CSCD Subscribers	Total
Education	59	29	88
Organization	14	10	24
Health	2	5	7
Government	11	6	17
Technology	0	6	6
Foundations	0	2	2
News media	0	1	1
Other	3	6	9
Totals	89	65	154

The breakdown of participant locations is again similar to that of the attendees of the live Webforum 2001. The primary difference is the Australian participants. Here we see that this group has become the largest international group and second largest representative location along with Manitoba (14). There is also an increase in participants from Minnesota, San Francisco (3), and the United Kingdom (2). At the time of writing, some 65 members, groups, and individuals have made use of the CSCD eResource for professional development and/or educational purposes. CSCD was never aggressively marketed. Subscribership has since diminished and again no formal study has been done. Our intent, however, is to provide the resource to future purchasers of the published book of the MDECD papers (in press).

Table 8. Post-event knowledge media participants by location

Participants: by Location	Archive Registrants	CSCD Subscribers	Total
New Foundland	1	0	1
Nova Scotia	1	0	1
New Brunswick	1	1	2
Quebec	8	2	10
Ontario	2	13	15
Greater Toronto Area	62	20	82
Manitoba	4	10	14
Alberta	2	1	3
British Columbia	2	1	3
New York	0	1	1
Minnesota	1	2	3
San Francisco	1	2	3
United Kingdom	1	1	2
Australia	3	11	14
Total	89	65	154

6.3. The Red River College Early Childhood Education Resource

The Red River College initiative was an unexpected outgrowth of the MDECD that provided a unique insight into the process of translating knowledge for different audiences. When Red River College (RRC) in Manitoba, Canada decided that they wanted to work toward updating the Early Child Education (ECE) curriculum to reflect the latest science, they approached Dr. Fraser Mustard of The Founders Network.[10] He informed them about the MDECD and suggested that they contact us to discuss a future potential association.

In spring of 2001, we met with the Red River group at OISE/UT. They spoke to us about their intention to seek funding to support the project and we welcomed the collaboration. It was decided that the group should participate in the MDECD events. They enrolled as part of the distance auditor group in the graduate course and attended Webforum 2001. The core project team members flew to Toronto to attend the live webcast conference but they also arranged for the college to be a satellite group so that other faculty could participate online from Winnipeg. After the final event in the spring of 2002, we hosted an additional online seminar for ECE faculty to further discuss the knowledge and its potential applications to practice. This was attended by 13 individuals located in Toronto, Manitoba, British Columbia, and Nova Scotia.

With funding in place, RRC assembled an advisory committee comprised of faculty from colleges across Canada to help develop a strategic plan, translate the content for the college level, provide input into the design of the prototype, and serve as pilots' sites. The Webforum archives became the primary base for what has been developed into a five-module interactive multimedia resource for Early Child Education programs at the college level. The screen capture of WebCT shows the home page for the ECE resource (Figure 6).

This resource was iteratively piloted with ECE faculty across Canada from 2002 to 2004 and is currently being piloted for professional development as well as with students and faculty in ECE programs in Ontario, Manitoba, Alberta, and British Columbia.

7. DISCUSSION

A VLE is defined elsewhere in this volume as a "learning environment mediated by computers and digital technologies." VLE case studies are described as, "instances in action framed by conceptualizations, technologies, and cultures." The data gathered during Webforum 2001 demonstrate how MDECD's original conceptualization of a socio-techno design for knowledge development in early childhood was advanced by the use of the ePresence Interactive Media System as a VLE. Details were collected on the participant community, their use of the technology, the nature of their interactions, and how they

Figure 6. Red River College ECE resource home page.

perceived the event. Examination of the postings also highlighted the critical role of facilitation and provided insight into the ways in which the technology contributed to sustaining a culture for learning and knowledge building across several different conditions.

Though a key objective of the MDECD was to achieve conceptual innovation—what McLuhan (1964) would have referred to as the "message"—the initiative also became a learning experience with respect to technological innovation—or the "medium"—and how social relationships are impacted. Webforum 2001 was intentionally designed to move beyond a traditional conference format to explore alternative possibilities, and part of this involved broadcasting the roundtable sessions from a separate location so that the library audience could experience what it was like to be a remote participant. We did not anticipate, however, that the audience would consider this a breach of social custom and feel excluded from the scientists who were merely feet away in another room. It would appear that as creatures of habit we tend to prefer what we are familiar with, face-to-face interaction within familiar convention. The OISE/UT participants clearly attended Webforum for the knowledge content and not the technological medium. This may also be a reason why their engagement decreased during the roundtable sessions; it is possible that they felt excluded or uncomfortable using the computer terminals to submit questions.

The remote audience, on the other hand, was of necessity drawn into both content and medium. But though they experienced numerous technical

glitches, their appreciation of being able to attend the event at all superseded any inconvenience arising from these complications. As the technical difficulties decreased and their familiarity with the technology increased, they became more engaged and even shared how they were experiencing the technology, providing invaluable "in the moment" insights through postings that made their thinking explicit. They also bonded together in moments of difficulty often helping each other when problems arose. In this respect, we saw that the ePresence VLE afforded a sense of inclusion and community amongst the online distributed participants.

The technology also afforded other advantages and unanticipated uses not readily available to the local OISE/UT participants. Remote users were able to socialize with each other as well as input and offer general commentary to an extent that the local audience could not. For example, it is highly unlikely that a face-to-face member would have felt comfortable enough to comment on how the roundtable discussion was organized or to make suggestions for improvements in front of other audience members. Social interactions using the various ePresence VLE features, such as the sequence between the mother and the son, demonstrated how the ePresence system supported multitasking. The two interlocutors not only attended the event and submitted public questions, but they were also able to talk privately about their impressions without interrupting the other attendees. Face-to-face participants would have to wait for the break to engage in this kind of discourse. Another advantage of the ePresence VLE was that users could scroll back and forth through the presentation slides or print up hard copies. These observations by no means suggest that given a choice the remote users would not have preferred to attend the event face-to-face, they merely point out the extent to which the technology had built in affordances that the participants used as they saw fit, sharing their impressions and taking the initiative to shape the experience into something more personally meaningful.

Finally, the features of the ePresence VLE supported multiple modes of interaction across time, space, and distance. Synchronous interaction was supported as participants engaged with each other and the expert presenters either using the microphone in the library space or live chat and text question features in the VLE. In addition, the captured event and the subsequent knowledge media products provided options for distributed users to access the multimedia knowledge base and interact synchronously or asynchronously with others either through a live chat or threaded discussion, respectively.

A significant aspect of interaction was mediation. Vygotsky contributed to our understanding of the role of the facilitator in scaffolding the learning process (Bruner, 1985) and Wenger (1998) refers to the broker who mediates between different worlds to build connections for improved information flow and augment social learning opportunities. Our experience with Webforum emphasized the importance of this. Not only was facilitation required to mediate the face-to-face dialogue and to help remote users with the technology,

consistent effort was also required to ensure that the virtual presence was included into the face-to-face proceedings. This notion of facilitation was also apparent in the Red River College initiative where the MDECD team assisted in the translation of the knowledge base for a college level Early Child Education program. Last but not least, the ePresence VLE was invaluable as a "brokering" tool. As seen in the transcripts of the online postings, the technology afforded rich insight into what the users were going through, how they adapted to the environment, and what they thought of the technology. In effect, the technology served as a facilitator, or mediator, helping us to understand the participant experience and leading us to think differently about social relationships we generally take for granted. These insights have been instrumental to the ongoing iterative design improvements of the ePresence Interactive Media System at KMDI. Details on some of these are discussed below.

Less positive aspects of the technology were that distractions arose when things did not work properly and when the public chat was cluttered with public notes related to individual technical problems or non-content-related issues that would have been better handled using the private message feature. As the logs, show however, this "improper" use diminished by Day 2 as users became more familiar with the VLE. The switch from the library location to the roundtable conference room further contributed to renewed disruptions and adjustments. As webcast technology was still rather sensitive at that time and the majority of the online participants were novices to webcasting, it might have been best not to have moved the equipment. In future, we might think about having either the complete conference in one location, or duplicating the technology set-up in the roundtable room to make the switch over more seamless.

Response from both the face-to-face and online participants indicated that the 2-day Webforum was successful on a couple of levels. First and foremost was the level of public satisfaction. The event was well attended, and the ePresence VLE helped to establish a sense of community through supporting interaction amongst the online participants and across the remote into the material conference. As witnessed by the learning community that emerged during the Red River initiative, the ePresence multimedia capture of the 2 days also inadvertently became the first step in sustained community building.

Learning communities emerge when like-minded people group together to make connections, share ideas, pursue mutual goals, and generate knowledge in a mutually supportive and reciprocal manner (Daniel, 2002; Marsick et al., 2000; Misanchuk & Anderson, 2001). Another characteristic is a diverse participant group—ranging from novice to experts—that can enrich the learning experience and contribute multiple perspectives (Xiadong et al., 1996). The Webforum event brought together an extremely varied group of students, organizations, researchers, policy makers, and practitioners all seeking to access the most current knowledge in early child development and to discuss practical applications. The ePresence VLE broadened this knowledge network across

geographical boundaries and facilitated the extension of what typically would have been an isolated 2-day event through establishing the knowledge base that was subsequently used for the creation of the knowledge media products.

8. WHAT HAS HAPPENED SINCE

Our early uses of ePresence including Webforum 2001 convinced us that it was important that events be easily archived and made available to users *via* a customizable web portal. The archives needed to be hierarchically structured, browsable, and full-text searchable. Our implementation of this provides an interactive timeline and two-level table of contents for easy browsing and navigation. The concept of hierarchically structured video is based in part on work described in Baecker et al. (1996) and Baecker and Smith (2003).

The current ePresence Interactive Media system (Baecker 2002; Baecker 2003; Baecker et al., 2003; Baecker et al., 2004; Baecker et al., 2004) also allows configurable live and archive interfaces through tailorable "skins", which allow site-specific control over the layout and typography of both interfaces, and the inclusion of corporate logos for purposes of "branding". The media capturing and streaming engines run under Windows or Linux; client viewers exist for the IBM PC, the Macintosh, and Linux. Media may be transmitted using Windows Media, Real Media, and MPEG4. Webcasts may be received with bandwidths as low as a 56 K modem. The software is implemented with .NET technology, is highly modular, and is soon to be released open source (Baecker, 2005; Rankin et al., 2004).

One difference between knowledge media (Baecker, 1997) and traditional media is the ease with which we can modify the capabilities and qualities of the medium through relatively straightforward software developments. Thus, motivated in part by insights gained in Webforum 2001, and in the hundreds of hours of webcasting done by us and our ePresence partners since that event, we are currently engaged in a number of initiatives to enhance the software and make it a better VLE:

- supporting mobile devices for ePresence access so that attendees at an event (local viewers) can also participate in the dialogue among remote viewers;
- enriching the sense of presence, so that local viewers can get a better sense of the remote audience, and so that remote viewers can experience in even more engaging experience;
- allowing questions from remote viewers to be expressed in voice rather than in text using Voice Over Internet Protocol (VOIP) capabilities;
- allowing voice discussions (much like whispering to one's neighbor in a lecture) to occur while watching a webcast (Schick et al., 2005);
- enhancing our understanding of how knowledge-seekers use multimedia archives (Dufour et al., 2004; Dufour et al., 2005; Toms et al., 2005);

- enabling searching of the archives using the voice track in addition what exists now, which is searching *via* text that appears in the chapter titles and in the slides;
- integrating a real-time chat capability that has persistence after the event with a capability for threaded discussions over the archives (Baecker et al., in press);
- integrating ePresence with an online course environment so a course could seamlessly interact with live events and archives increasing the impact and sustainability of the VLE.

CONCLUSION

McLuhan maintained that the tendency to focus on the message and not the medium underestimates the real impact that media have in radically altering the experience being communicated (Marchand, 1989). The MDECD sought to address this conceptual–technological divide by bringing the science in early child development together with leading-edge technology with aspirations of exploring a socio-technological design for knowledge advancement. This chapter describes how we used the ePresence Interactive Media System as a VLE for Webforum 2001—MDECD's culminating event—as a preliminary foray into the role of technology for supporting geographically dispersed participants and mediating social opportunities for accessing, sharing, using, creating, and proliferating knowledge across real and/or asynchronous time. Webforum 2001 as a 2-day event did not generate large quantities of data, neither was it formally designed in advance. Its significance, nonetheless, was that it germinated the seed for ongoing technological design and the emergence of a learning community for Early Child Development, which is still active to the present day.

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Research Council of Canada, and the Bell University Laboratories of the University of Toronto.

ENDNOTES

1. Webforum 2001 took place on November 8th and 9th at the Ontario Institute of Studies in Education of the University of Toronto: see http://hdap.oise.utoronto.ca/mdecd or http://www.Webforum2001.net.
2. OISE/UT: see http://oise.utoronto.ca, Invest in Kids: see http://www.investinkids.ca and the Lawson Foundation: see http://www.lawsonfoundation.ca.
3. Canadian Institute for Advanced Research: see http://www.ciar.ca.
4. Developmental Health is an omnibus term the authors use to describe a variety of developmental outcomes such as competence and coping, mental and physical health, and educational achievement.
5. For chapter summaries by Dona Matthews: see http://hdap.oise.utoronto.ca/dhwn.
6. Zijdemans was a member of the committee from the outset and deeply involved in the initiative.
7. Knowledge Forum (http://kf.oise.utoronto.ca) was developed at OISE/UT by faculty members, Scardamalia and Bereiter, to reflect constructivist pedagogical theory by supporting individual and collective understandings of the world through problem solving within a collective discourse.
8. Webcasting technology is typically a one-way broadcast medium that pushes or streams audio and video via the internet so that it can be viewed on a personal computer using a web browser. In contrast to video conferencing, webcasting moves beyond the one-way transmission model in that is a scaleable to a large number of distributed recipients and typically does not experience the same delay.
9. Today, we still use a 3–4 person crew if a high quality production is required (e.g., multiple cameras, mixing, etc.) but it is also possible now for one person to record an event.
10. The Founders Network: see http://www.founders.net.

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