Using Virtual Classroom Software for Distance Library Instruction in Health Continuing Education - An Exploration

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Royal Roads University, situated in Victoria, British Columbia (Canada) and founded in 1995 after the closure of Royal Roads Military College, is distinguished by a government mandate to provide applied professional online degree programs. The majority of programs are offered at the graduate level and are delivered using a distributed learning model. This model combines an on campus residency of 2 to 4 weeks with online distance courses. Given the programming and model of the University, it has been essential for the Library to develop online collections and services wherever possible.

Royal Roads University Library became involved in a pilot distance continuing education short course, Interprofessional Practice and Clinical Informatics, early in the course development process in 2003. From the beginning it was clear that the pilot course, with its health informatics emphasis and distributed online delivery, presented new challenges to the achievement of library outcomes that would have to be met by developing a new model. Due to the focus on health informatics mastering information literacy and fluency outcomes would be more critical than ever to learner success. Also, while certain learner objectives might be met through independent, asynchronous study, an element of real time, “high touch” interaction would be highly desirable to bring the synergy of a group to learning in the moment.

In his article in the Hedgehog Review theme issue “What’s the University For?”, Jackson Lears wrote that “Distance learning is to learning as phone sex is to sex: it may be better than no learning at all, but you wouldn't want to confuse it with the real thing” (2000, 18). While librarians at Royal Roads University did not view distance learning quite so
negatively, we recognized that to be effective, to achieve the same outcomes as the “real thing”, the online-only mode would require different design strategies and tools from instruction than those used in fact-to-face instruction.

In fact, several months before this project, we had begun to investigate means of enriching existing asynchronous service offerings with the capacity to interact with learners online in real time. Motivated by two distinct purposes, we found ourselves exploring synchronous tools in two different categories:

- **Virtual reference** – synchronous online support for the individual distance learner at point of need in the research process. Typical characteristics of virtual reference applications include page pushing, chat, co-browsing, session transcripts, and application sharing.

- **Virtual classroom** – synchronous online learning environment for groups. Typical virtual classroom functionality includes application sharing, question management features, audience polling, whiteboard sharing, session archiving and exporting, and chat.

By the fall of 2002 we were encouraged by early indications that there was at least one library-oriented product available, LSSI Virtual Reference Software, which offered functionality for both virtual reference and virtual classroom. We combined our background research with a product trial, site visit, and conversations with other librarians that had started using this software. We concluded that the product might fulfill the virtual reference imperative for users on the same local area network, but was not
sufficiently robust for remote access users. We were also never able to see the virtual classroom function in operation.

While this product had been favorably received at some libraries, we later learned that at least one early adopter library moved to a standalone instant messaging product, citing as a cause a high percentage of bad transactions ranging from impaired functionality of the software to dropped connections. It may be that some libraries draw a high proportion of their traffic through their internal network, which would be the best performance environment for this application. The expectation at Royal Roads could not be the same because 80% of the learner population is working from a distance at any given time. Subsequent development of the LSSI virtual reference product and other similar applications may have resulted in greater stability, although this remains a topic of discussion in professional forums such as the DIGREF listserv and in the professional literature (see for example Coffman 2004).

Our investigations helped to refine our requirements for a synchronous tool and the features best suited to our client needs. In our circumstances, then and now, virtual reference does not offer sufficient value for money over our present synchronous and asynchronous tools – email and phone. As most of our learners are graduate students, their questions tend to be complex. Librarians who use online synchronous applications have told us that they are more effective for finite transactions than for extended research support. Accordingly, we concluded that we would gain most from a virtual classroom application that would allow us both to support program offerings in a distributed, online-
only mode and to address in a tutorial setting some of the shared research support needs of graduate learner teams. Consequently, in late autumn 2002 we began examining virtual classroom applications that did not have a specific library orientation. In taking this direction we recognized that the Library was only one potential user of such an application at the University. Moreover, some product trials had already been conducted by other departments on campus, thereby providing the potential for internal partnerships.

Early in 2003, the pilot course entered the scene and provided a focal point and a timeline for our efforts. One objective of the pilot was to assess the relative effectiveness of various synchronous and asynchronous tools in facilitating learning for health professionals in a distributed continuing education setting. Because of our evolving related interest, the Library volunteered to fulfill part of this objective by delivering content through the medium of a synchronous online tool. We subsequently continued our review of such tools together with representatives from other stakeholder groups in the pilot delivery, including instructional design and the technical trainers, who were to provide both content for the course technical training outcomes and end user support for the technologies used in the course.

Evaluation and selection of synchronous tools

Synchronous online learning products were evaluated on the basis of software features as well as issues surrounding their implementation, delivery, and use by learners and instructors. Based on our previous research into virtual reference software and collaborative online tools, the list of features that we hoped to find in our virtual
classroom product included white board functionality, audio enabling, application and
document sharing, break out spaces, instant messaging, archiving and session playback
functionality, as well as the ability to export the saved session.

In addition, all stakeholders involved in the software evaluation determined that tool
selected must be accessible through a minimum of a 56 K modem, Macintosh and
Windows compatible, scalable, relatively easy to support (from a technical support
standpoint), easy to configure, and capable of application and document sharing
(particularly important to the library to enable co-browsing of library online databases).
We were also interested in being able to save transcripts of synchronous sessions in order
to build a knowledge base. Other features identified as useful included participant polling
and question queuing.

Our primary concern was that the product be as easy to use. For this reason, one of the
most important considerations was whether or not learners would be required to
download and install software on their end. We did not want installation and
configuration to present an obstacle to the content, especially since the library activity
would occur early in the context of the course. In addition, we anticipated that some
participants would not use their own computers and therefore might not have requisite
permissions to download software or clients. Post-course feedback confirmed that this
was the case with 50% of the learners.
Based on our initial research and on system requirements and features, we narrowed down the preferred synchronous products to HorizonLive and PlaceWare. At the time, both PlaceWare and HorizonLive required plug-ins for their sharing features but these were small downloads and only required for presenters rather than participants. The attendee configuration for HorizonLive required the presence of common plug-ins for audio and video, but verification of these features could be facilitated by an online wizard prior to attending a session.

While both HorizonLive and PlaceWare offered the ability to play back prerecorded sessions (archiving), PlaceWare did not offer voice-over-IP to distribute one-way audio over the Internet. PlaceWare's only solution for audio delivery over the Internet was to record the session with audio conferencing, which would then require play back from the Internet at a later date. Since HorizonLive did offer one-way voice over the internet as part of its package, it was possible to have people listen over their computer speakers and/or through a telephone audio bridge. To enable this audio broadcasting, the presenter had to download and install a special plug-in from HorizonLive and have their telephone and computer connected. Without this device, the voice-over-IP portion would not function when using a telephone bridge. This scenario provided a solution for people who need to listen over their computer (using speakers, microphones, or headsets) rather than a telephone. It would also be useful for single dial-up connections.

Trial access to PlaceWare and HorizonLive allowed the software evaluation group to test both products as both participants and presenters. Both products offered the choice
between using a collaborative mode or an auditorium mode for the delivery of synchronous instruction. Collaborative mode allows for audience participation and control over tools equal to that of the presenter, whereas auditorium restricts participants’ ability to co-browse, co-share, co-author on the whiteboard, etc.

The test scenario involved delivering mock library and help desk instruction in a simulated virtual classroom environment. Initial demonstrations using the collaborative mode revealed that synchronous sessions delivered in this environment might quickly become chaotic. This can be acceptable or even desirable in a workshop or team collaboration setting, but it clearly would not be viable to facilitate an instructor-led session in this mode. In order to ensure a more controlled and effective delivery, we decided that the auditorium setting would be the best mode for delivering our sessions.

In the end, we selected HorizonLive as the preferred product for the delivery of the pilot project instruction. HorizonLive offered a participant software and interface that was both user-friendly and intuitive. This fit well with the earlier identified need of finding a tool that would be relatively easy to support from a help desk perspective.

In testing both HorizonLive and PlaceWare we came to a new appreciation for the level of resourcing, both human and technical, required to effectively deliver synchronous online instruction. In terms of human resources, it appeared to be necessary to have one person manage the content delivery with an additional person to field audience questions.
We reflected that it would even be helpful to have a third person who could assist the other two presenters with troubleshooting or in the event of heavy question volume.

**Content development for virtual classroom delivery**

Our initial plan was to derive content for the pilot course from our face-to-face instruction sessions. It quickly became apparent, however, that the content was not unaffected by the medium of delivery. Because this course was designed as an exploration of health information sources, the students could be expected to have more interest in the mechanics of how to search and how information is structured than in the results of searches themselves. This expectation was confirmed in meetings and email exchanges with the course instructor, who was interested in presenting diverse online information databases for interface variety more than for the content they might contain. Accordingly, we decided to structure the content in three parts:

1. Introduction to library services and overview of library instruction objectives;
2. Defining the research question, search strategies and techniques, and the role of controlled vocabulary; and
3. A sample search in one online licensed health database using the skills introduced above.

This strategy for organizing the content was in large part adopted to respond to the features and constraints of the online synchronous tool. To begin with, it would have been very time consuming to script and record a perfect session of more than twenty minutes duration. HorizonLive archiving does not allow any pauses or edits. Because we
expected to use the tool synchronously, this did not strike us as a liability until we began to consider asynchronous delivery. In subsequent content development for asynchronous use we have employed a screen capture application with Flash output that offers greater flexibility in editing, including sound. There are a number of applications of this kind, but the tool we have used for this is the Qarbon Viewlet product.

In creating archived sessions in HorizonLive, and later in Viewlet, we conjectured that the students would neither want nor have time to listen to one lengthy tutorial. We also wanted to keep files to a size that a learner could successfully download to a remote computer. Creating a series of shorter tutorials rather than one lengthy tutorial would allow us to distribute responsibility for content development among a number of librarians, thereby giving us all experience in using the tool while sharing the workload equitably.

A challenge in using HorizonLive to archive sessions was how to integrate other software applications into the tutorial. The first two parts of the tutorial captured a voice-narrated PowerPoint presentation, but in HorizonLive the imported PowerPoint slides become a series of .gif images, with the consequence that you can no longer navigate in and out of slides by clicking on embedded URLs. This created a need to import screen captures into the PowerPoint demonstration. Moreover, there was a slight time delay between the audio recording and the software navigation, so that when we were narrating, particularly the demonstration of the database searching, we had to take care to pace carefully in order to ensure the demonstration remained as synchronized with the audio as possible.
Although important, HorizonLive was just one tool in the online delivery of this tutorial. We also developed a webpage to give context and direction for the HorizonLive sessions, and to provide a gateway to library resources for this course. Later we used the webpage to present alternate Flash versions of the HorizonLive sessions. The HorizonLive sessions took a disproportionate amount of time to create, partly because of our inexperience with the software, but also because of the complexities of using the software in the way that we did, as we tried to anticipate and obviate difficulties in delivery.

The amount of time required to develop the online tutorial sessions for this course far surpassed the amount of time that we require to prepare for equivalent face-to-face encounters. Again, that is partly because of our lack of experience with the synchronous tool. Even assuming familiarity with the tool, however, the level of planning, scripting, rehearsal, and co-ordination of effort needed to develop the content for the online synchronous session was much greater than that required to produce a well planned face-to-face session.

**Investment in training and instructional design**

As we began to develop content, librarians conducted further testing. This included experimenting with local and remote connections and trying various software features and instruction scenarios. Ultimately we concluded that the complexities of live application-sharing using HorizonLive posed too great a risk of compromise to the learning event in this case and with this group of learners.
Hours of training and exploration were required to learn how to create and deliver content for what was to be a relatively short online session. Although we could foresee picking up speed as we developed our expertise, we felt that at least two librarians (and at least two computers) would always be necessary to do a synchronous online demonstration: to work through the content, to answer questions, and to verify that the tool was working from the user perspective. Furthermore, we would have to hold multiple sessions both to accommodate diverse shift schedules among the learners and to restrict online group size to facilitate coherent participation. In addition, it became clear that training users in the synchronous tool was not a good investment in the unique circumstances of this course. We would have little prior knowledge of users’ technical abilities, level of information fluency, platforms, or connection speed. Also, the duration of the course was quite short and, since this tool was only to be used at the very beginning of the course for relatively small segments, the training for live interaction would take as much or more time than the actual session that the tool was meant to facilitate.

For the reasons described above, librarians decided to create “archived” demonstrations using the HorizonLive tool, together with PowerPoint presentations that the students could view independently at the beginning of the pre-course week. Synchronous Q&A sessions using HorizonLive would be scheduled for the latter half of the week. This altered approach would give the students an introduction to the synchronous tool, exposing them to the look and feel of the software without requiring interaction or much navigation. We felt that having had this experience, together with their other technical
training, the students would be prepared for a library Q&A HorizonLive session. The inclusion of co-browsing, if it worked, would be good but not essential in a Q&A situation. Using the features of the auditorium mode, we knew that we could create archived sessions with HorizonLive relatively easily. The archived sessions would include a mixture of PowerPoint introductory material as well as a demonstration of a search within one of the online databases. We would also include audio and the archived sessions would be no more than one hour in length in total.

We also planned for three one-hour Q&A sessions scheduled at various times to accommodate health professionals. The Q&A sessions were intended to allow participants to give feedback on the archived sessions and to ask questions about the archived material or about library research generally. These sessions would also allow the Library to test HorizonLive in a live setting. The content for the archived sessions was identified, scripted, and created. It was then submitted to the instructor for review.

Shortly before the course went live, the university stakeholders involved in the pilot held a meeting where it was decided that HorizonLive would not be used as a live tool for either the technical training or for the library Q&A sessions. This decision was reached partly due to growing concern about the technical literacy levels of the learners based on their early contacts with technical trainers, and partly because of bandwidth problems that we had begun to encounter in testing the product for remote access.
The bandwidth concern resulted mainly from the co-location of all instructors at one site with the users widely distributed, with all attempting to use a third party-hosted web application. Each individual user competes for bandwidth within his/her own system and institutional frameworks. This scenario could occur at any institution, and there were a few, not unexpected, problems as a consequence. Any bandwidth-consuming process on the university network could lead to the situation wherein learners are able to reach the common external server with ease while the instructors, co-located at the University, have difficulty reaching both the same server and the learners due to delays getting outside the University. In that scenario, all external users would see excellent response while those inside would experience unacceptable delays. The problem can be controlled through the use of bandwidth management software to prevent any one or two processes from consuming the entire off-campus bandwidth capacity. In this instance, there was insufficient time to implement the solution prior to course start-up.

The decision to not use the synchronous tool in a live interactive form was a difficult one. In spite of the considerable investment in development, there was general concern that learners might gain a negative impression about the course as a whole if early on they were inappropriately challenged to use a new learning technology, or if for any reason the tool did not work well from the trainer end.

We decided to proceed with the archived HorizonLive library sessions as an introduction to library research, as well as providing similar information in other more accessible formats in case the students had problems viewing the archived files. Q&A was handled
using the asynchronous discussion group tool already available on the RRU learning platform. Discussion groups were monitored over the course of three days. Students were requested to participate, but participation was not mandatory. Synchronous contacts between librarians and learners occurred one on one over the phone.

As the course went live, some students had difficulties viewing the HorizonLive archived sessions because they either lacked the commonly available plug-ins required for audio and video, or had difficulties installing plug-ins on local computers. The considerable interest in the library sessions led us to explore various options for improving the accessibility of the content on the fly. The most effective solution was to make the sessions available using Camtasia, a screen capture software that makes a compressed flash file. The output has a movie-like quality but does not require any plug-ins. The university technical trainers did not use HorizonLive at all for their presentations, but they did create documentation to lead the learners to access the archived library sessions. Their Q&A was handled using teleconferencing as a synchronous tool.

**Lessons learned**

Once we chose an application and began work on a project with a deadline, the learning points came quickly. We learned the importance of:

- **Granularized content**: Smaller is better, in both production and delivery: designing and producing content at a very granular level makes it easier to record, update, and download. A segment of 20 minutes is suddenly not so small!
• **Time required to plan and deliver:** The HorizonLive sessions took a disproportionate amount of time to create, partly because of our inexperience with the software, but also because of the complexities of using the software in the way that we did. The time required to develop the online tutorial sessions for this course far surpassed the time that we require to prepare for equivalent face-to-face encounters.

• **Staff and technology resources:** Even assuming familiarity with the tool, the level of planning, scripting, rehearsal, and co-ordination of effort needed to develop the content for the online synchronous session is greater than that required to produce a well planned face-to-face session. We also learned that a minimum of at least two, preferably three librarians and corresponding equipment would be required to effectively deliver an online session using synchronous technology: one person to facilitate and navigate, one person to monitor and manage questions from the audience, and a third person to monitor the audience view of the presentation to ensure everything runs smoothly.

• **Adequate bandwidth:** Our bandwidth issues resulted mainly from the co-location of all instructors at one location with the users widely distributed, and all attempting to use a third party-hosted web application. Each individual user competes for bandwidth within his/her own system and institutional frameworks. Some mitigation is possible through use of bandwidth management software that prevents any one or two processes from consuming the entire off-campus bandwidth capacity, eg. Streaming MP3s. Unfortunately, we did not have
bandwidth management in place until shortly after the course start up. There are many home users who are still constrained to 56K.

- **Minimizing end user configuration/installation:** As the course went “live”, some students had difficulties viewing the HorizonLive archived sessions because they either lacked the commonly available plug-ins required for audio and video, or had difficulties installing these plug-ins on computers locally. Troubleshooting these issues consumed instructional time.

- **Alternate delivery strategies:** We learned that a back up plan is essential. The considerable interest in the library sessions led us to explore various options for improving the accessibility of the content on the fly. The most rapid and effective solution was to make the sessions available using Camtasia, a screen capture software that makes a compressed flash file. The output has a “movie-like” quality but does not require any plug-ins.

Both the Library and the Instructional Design group are considering future use of synchronous online applications, but there are no current deployments at Royal Roads University. Considerations for a successful future deployment include the ease of support of the tool (plug-ins, customizability, authentication issues, etc. all need to be in the background); investment in learning (will learners use the tool for multiple activities?); affordability of the tool; and ensuring there is adequate bandwidth for participants using the software.
It is also important to consider when synchronicity is appropriate and useful when your students are working on diverse schedules or are located in multiple time zones. For example, it would be a challenge to find a reasonable time to hold a session for learners who are 12 hours ahead. Bandwidth and other technical challenges are also considerations in using virtual classroom software to support students across time zones. While awaiting new developments in synchronous applications, we have been actively working to improve our asynchronous services.

Conclusions

In conclusion, all University stakeholders agree that the experiment with content development and delivery using a synchronous tool provided a valuable learning opportunity, with many of the learning points unanticipated. In the Library, our experiences have been applied in subsequent content development for online delivery in an asynchronous mode, and have influenced our thinking about how we might use a synchronous application in future.

Our pilot online synchronous efforts did not demonstrate efficiencies over face to face, email or phone, largely due to the time required for set up of synchronous tools on the presenter end, the learning curve for using the software, the number of people required to deliver instruction, etc. Nevertheless, we are encouraged that while remote instruction has required travel on the part of a librarian or other instructor, online content can be delivered effectively using various strategies and tools, perhaps in future including an online synchronous learning tool.
References:

Coffman, Steve. “To Chat or Not to Chat - Taking Another Look at Virtual Reference.” 