AN EVALUATIVE CASE STUDY
THE EVALUATION PROJECT

The evaluative case study was part of a project undertaken by the Continuing Education Division, Ryerson Polytechnic University, and supported by the University; The Office of Learning Technologies, Human Resources Development Canada; the Eaton School of Retailing; and more recently, the National Sector Adjustment Services Committee and the Retail Council of Canada.

The purpose of the evaluation was, in part, to develop and test an evaluation model for the Internet-based portion of the Ryerson Retail Management Education Program but also, ultimately, to inform the creation of a “toolkit” for educational decision makers who want to develop “technology-enhanced” courses.

This “toolkit” or guide would address the attitudinal and design issues relevant to the effectiveness of technology-enhanced learning. The toolkit would consist of qualitative, quantitative and comparative instruments, and strategies that an educational practitioner could use to select appropriate technologies with confidence. It would be for use by educational organizations to help select effective learning technologies for application in formal and non-formal educational settings.

Phase one of the project consisted of the design of a prototype evaluation model, grounded in previous research and development initiatives in the area of new learning technologies.

Phase two consisted of testing the model to improve its usefulness in delivering technology-enhanced courses.

Phase three involved the development of the toolkit.

A final phase will evaluate the use of new learning technologies in the context of work-based training.

This report is concerned with the first three phases of the project.
The model outlined above formed the basis for the evaluative case study. The content for the initial questionnaire design and interview schedules for the first iteration were based on the above considerations. However, these were modified in practice by initial findings from observation, interviews, and questionnaire responses.
THE COURSES

The courses to be evaluated for the case study were:

CZRS101: Retail & Services Management
CZRS108: Issues & Innovations in Retail
CZCM101: Introduction to Retail Management
  Communications

All three courses were to form part of the new Certificate in Retail Management at the university.

The courses were deliberately experimental in terms of the use of technology and presented a development along three main dimensions:

• the richness of the technology used; and
• the degree of distance involved for the students
• the degree of synchronicity involved in course activities

CZRS101 used a wide variety of different technologies, including videoconferencing, audioconferencing, Internet technology (chat lines, bulletin boards, web searches) videotapes and print.

It had a low degree of distance because every other week one group would meet with the tutor face-to-face while the other was at a distance and vice versa.

There was also a high level of synchronicity. All main course activities and some team activities took place in synchronous time, with teams meeting face-to-face as a general rule, and only some teamwork using distance technology to communicate asynchronously.

The students on this course were all continuing education students pursuing courses that were in the Certificate in Retail Management.
CZRS108 used a narrower range of technologies. There was no videoconferencing and the main interaction between teacher and taught was by synchronous computer conferencing.

The students were also more distanced from each other, requiring more reliance on technology and less on face-to-face meetings for teamwork. Only one student was out of province.

While approximately half the course activities took place synchronously via web conferencing, the teamwork was achieved with much more asynchronous forms of communication.

The students on this course were a mixture of continuing education students pursuing courses for the Certificate in Retail Management and undergraduate students from the School of Fashion for whom the course was a requirement for their degree.

CZCM101 had the narrowest range of technologies, relying on bulletin boards, e-mail, telephone and fax for both main class and group activities.

It was also the most distanced course, with some students neither in province nor in country.

It was also conducted asynchronously, with the main means of communication being asynchronous computer and telecommunications technology.

The students on this course were, once again, all continuing education students taking this course as part of the Certificate in Retail Management.
THE METHODOLOGY

The main methods used to evaluate the courses were:

- observations of class sessions
- monitoring of computer conferencing
- monitoring and analysis of chat logs
- questionnaires to students
- interviews with students, staff, designers and administrators

This resulted in mainly qualitative data, although there were some quantitative findings that built up over the three iterations.

It is interesting to note that as the courses became more distanced and asynchronous, this had an effect on the return rates for the questionnaires, which were 100% for the 1st Iteration, 48% for the 2nd Iteration (but 100% for the continuing education students) and 34% for the 3rd Iteration.

Regular Observation Reports were submitted to the course team during the first two iterations. As the 3rd Iteration was asynchronous, it was not possible to observe sessions and the class web site was monitored instead.

Relevant observations about the course were relayed to the course team at meetings.

While the evaluation had begun as summative, in order to preserve evaluator objectivity, it soon became clear that this would be much less beneficial to the course team. It quickly turned into formative research with the evaluators regularly attending course team meetings - mainly as observers but on occasion as participants when their input, based on interim findings, could improve design and implementation strategies.
THE FINDINGS

It is important to note at this point that the findings, due to their mainly qualitative nature, should be regarded as indicative rather than authoritative. Nonetheless, many of the findings echoed previous research and the experience of both the evaluators and the participants on the course (that is, designers, administrators, teachers, technologists and students).

The evaluators had both had extensive experience as distance educators using a variety of technologies, and were able to analyse the findings in terms of this experience.

The numbers of students on each course were low and finding statistical significance was impossible on a separate course basis. However, by aggregating data for all three courses, certain tendencies and indicators emerged.

Although interesting in educational terms, they are not necessarily statistically significant. While these low numbers may have suggested parametric testing, this was not considered to be particularly helpful in this case and simple display techniques have been used to demonstrate distributions visually.

The findings are therefore presented in tabular form where quantitative data exists but are buttressed by the qualitative responses that provide more detailed information. Unless otherwise stated the quantitative results are the responses from all three iterations aggregated.

These evaluative case study results have been used in the development of the Guide for Virtual Course Design and Implementation, along with other information sources.
Goals

It was clear from course team meetings, and in interviews with Ryerson staff, that the main goal of all these course iterations was to develop more distanced education courses in the retail management field that would expand educational markets for the university. They should also use the existing academic, educational and technological expertise in the university to maximum effect. In addition outside experts from the Retail Industry would be used to provide relevant content. While reducing costs was not the main concern at this experimental stage, an eye to costs in the longer run was a very real concern.

The two professors taking part in this development of courses were both enthusiastic to try new technology to enhance their teaching and reach more students, and for one at least it has resulted in considerable promotion within the university. One professor said that the ultimate goal for all courses goal was to achieve a critical mass of students at a distance and combine the best of both worlds (i.e. classroom and the web).

Specific educational goals for all three courses centred on detailed course content relevant to the retail industry, and on the skills and attitudes necessary for effective teamwork. A more general goal for all courses related to improving the professional status of the Retail Industry, in which the university intended to play a lead role.

The goals for the sponsors were to discover how effective the new technologies could be for professional education and training, and to develop guidelines for future course teams, in educational institutions or in industry.

A further goal for some in the industry was to develop courses that were relevant to the retail industry and that could be used to increase professionalization in retailing. This would not only entail relevant content but also the skills needed for a professional career in retailing, such as the new technological skills and the ability to work in a team. Confidence and a willingness to learn new things would be attitudes to foster in students.
For the students the goals were systematically explored by questionnaire. While they had a wide variety of specific goals, it was quite marked that the technology itself, and its use on the course, was a big draw for all three courses.

Students on all three courses were clearly expecting to learn important knowledge about the retail industry and acquire technology skills. Not surprisingly, there were few comments about attitudes beyond the fact that many brought a love of learning to the experience. In the first iteration, which contained several HR experts, interest was expressed in seeing how new technology could be use to foster teamwork and be suitable for their company employees.

The responses from students, from all three iterations, (presented on the following pages) indicate a wide mixture of instrumental and expressive motivation, with an interest in technology generally and the course technology in particular being important motivators. A sheer love of learning for its own sake as well as the need for help in career development, were an important mix of motivation for many students.
**Students’ Motivation for Taking Courses**

- Required course
- Aid ext. promotion
- Employer required
- Help keep job
- Aid job satisfaction
- Suitability for others
- Aid promotion in co.
- Set example in co.
- Like meeting people
- Aid find new job
- Improve company
- Content interest
- Increase know/skills
- Course/tech interest
- Help career
- Keep up with trends
- Love learning
- Technology interest

*Respondents could check more than one response*
“What attracted you to the course?”

“I was familiar with the technology and it was an innovative way to learn.”

“The idea of using the Internet and the topic of innovation was interesting.”

“I wanted to carry on with the ESR program and also the content and the format of the course interested me.”

“This mode of education/technology was attractive.”

“Because it was high tech – I was falling behind in technology.”

“First the title – I’m most interested in innovation & wanted to know what’s new and different outside Eatons & second it was because of the Internet delivery – I didn’t know anything about it.”

“It was the technology – and being able to do it at a distance – I can’t drive to Toronto.”

“I was required to take it as part of the degree program but I was also looking forward to learning about future trends & how Eatons is placed in this regard.”

“Because I need to learn about retailing & because it was delivered in this format – I have to fit it in as I have time available.”

“I was hoping to spend less time in a formal classroom and more time in self-study.”

“I wanted to experience team assignments by e-mail.”

“I was impressed by the content - it was highly relevant.”

“It was important for keeping up and moving forward.”

“I’m interested in anything that can enlighten me.”

“My expectations are mainly in the area of self-development. I wish to acquire skills to help me become a more pro-active manager.”

“I am very interested in sharing in the experience of integrating technological delivery platforms for learning as a Program Development Manager. I am responsible for developing training programs for 400 store locations covering a wide geographical disparity. I hope to benefit through experiencing this process from the student point of view.”
On the subject of technology and the attitudes towards it that students brought to the course, we used two different questions to bring this to light.

First we gave them a series of attitudinal statements about technology, representing the following attitudes:

- pragmatic
- sceptical
- enthusiastic
- dismissive
- willing but anxious
- discouraged
- resigned/resentful

and asked them to check which one best described their feelings towards technology. This was designated their “presenting” attitudes to technology.

Next we used reflective technique, completing half finished sentences about technology, in action in work situations, to determine students’ “underlying” attitudes to technology.

The results showed that, while students presented a mainly enthusiastic or pragmatic attitude to technology, they had considerable anxiety and resignation/resentment about technology underlying their enthusiasm.

Of course, attitudes to technology are influenced partly by prior experience of it. This varied considerably from student to student. Some students had a wide experience of using technology for a whole variety of purposes; others had hardly used computers at all.

Of those who had little experience of technology but high hopes of the course, many found the technology frustrating from time to time. However, as the technology became more distanced and asynchronous, the frustrations seemed to decrease. This was due in part to the fact that a narrower range of technologies was being employed, and also to the feedback from the first Iteration that allowed vast improvements in course delivery.
Reflective techniques revealed that presenting attitudes to technology were more enthusiastic than underlying ones.
Less than half the respondents were frequent users of the Internet and a quarter had never used it before the course.

The use of e-mail was the most familiar technology but even so over a quarter of students had never used it before the course.
Only a small minority of the respondents had frequent experience of videoconferencing before the course.

Only slightly more respondents had frequent prior experience of audioconferencing.
Only a third of the respondents were conversant with CD-ROMs but the vast majority had used computers for word processing.
Three-quarters of respondents were frequent desktop publishers but less than a third had real experience of managing a computerized database.
Only a quarter of respondents used computers for statistical purposes; rather more (but still less than half) used them for scheduling.
Not surprisingly, more than a third of respondents had used computerized inventory control systems, but more surprisingly half had used computer graphics frequently.
Just under a quarter of respondents used computers for accounting and well over half used computers at the point of sale.
Only 15% of respondents were familiar with the language used for retail ordering.

Overall, about a quarter of respondents were frequent users of computers for a wide range of activities. However, about 12% had never really used computers before the course and a further 12% approximately had only used computers for word processing.

When we talked to students in the interviews, it was clear that those who were largely unfamiliar with the technology would have benefited from some type of technology prerequisite. The following quote, taken from an interview with a respondent from the 2nd iteration, is fairly typical of comments that were made time and again:

“In the first class I felt panic. I had no experience with chat or audio. If we could have had a quick chat session to know what to expect it would have eased us in.”
Content

The content of the courses was designed to provide part of the required knowledge for a Certificate In Retail Management, and ultimately to form part of a Degree in Retail Management. This was being developed at the time of the evaluation.

In addition, the university had researched the industry requirements in terms of the skills as well as the knowledge content for such a degree. These skills included teamwork, which formed an essential element of all three Iterations, as well as math skills, which were an important part of the 1st Iteration.

Content was an important element to the students also. It was clear from their comments that they expected to increase their knowledge of the retail industry and acquire new computer skills.

Many of them had taken previous courses, some at Ryerson, and their educational levels were high - most already had undergraduate degrees. However, most had not planned a career in retailing and their degrees were in a very wide variety of subjects. Some, like Medieval History, bore no relation to retailing, and others that were business related had not provided the type of content that students found they needed to advance in their careers.

When asked in interviews if their expectations about the level of the course had been met, most respondents said that it was about the right level but a few found it a little more difficult than they had expected.

When asked how valuable the course content was to the retail industry, 75% said it was useful and another 13% said it was very useful.

When asked how relevant to their own job, 50% said it was relevant and another 25% said it was highly relevant, while the remaining 25% said it was relevant in part.
Students’ Comments on Course Content

“My company is constantly on the cutting edge - It is essential for me to keep up with new trends - especially new trends in technology in retailing.”

“I need to enhance my personal knowledge of retailing and its innovations.”

“I was impressed by the course content in the course outline.”

“Some of the content looked interesting but it was mainly the technology that drew me.”

“My company felt almost all of the content would be useful.”

“The content did not look as if it would be new to me but the technology is needed for the company to survive!”

“This course content followed on from others that form part of the Certificate.”

“The content won’t be directly applicable to my job but I feel the need to keep up and I’m personally interested in innovation.”

“I already knew the basic content but I’ve got to keep on top of things and stay current so I am always looking for anything that can enlighten me - like what triggers customers - how you get them and keep them.”

“I am interested in the whole topic of innovation - especially in relation to retailing.”

“I wanted to know what’s new and different beyond what is at my company.”

“I must learn as much as possible about new trends and information in the retail industry.”
Means

The university, represented by the administrators in the Continuing Education Division, was clearly eager to test the new communications technology for course delivery. At the outset there was no restriction on the type of technology that could be used. As the project developed, expensive technologies, such as videoconferencing, that had not proved their educational value for the investment required were discontinued.

The professors employed a variety of teaching methods from the “lecture”, usually delivered by a guest speaker (via a variety of technologies such as video- and audio-tapes and multimedia web delivery), to student self-directed web searches and multimedia presentations.

The students did not always use all the technology available. If at all possible, many moved heaven and earth to meet face-to-face. When that was not possible and they had to rely on e-mail, this proved problematic. For a considerable number of students the technology was a hurdle that had to be surmounted. When that was achieved, their learning was enriched, but until that happened there was some frustration.

Although students seemed to prefer the technology that most resembled face-to-face interaction, such as videoconferencing, they were not always comfortable with its use in practise. And when asked what were the most important things they had learned on the course and what technology they had used to learn it, they cited more asynchronous technologies, such as video-tape and print.

There was no doubt that the technologies that were not familiar were the most problematic for students. Time and again students requested more time to get to know the technology before they had to use it for assignments, or they asked for a technology prerequisite course that they could take before other courses that required technology expertise. As a result the university is currently designing just such a course.
The above tables are ranked by frequency of response and weighted for order within each response.
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Comments on the Course Technology for 1st Iteration

“I found the audioconferencing more comfortable than the videoconferencing - not as many awkward moments or delayed reaction.”

“I found it ironic that I had to fax my info for the team assignment because I could not access Internet to use e mail.”

“Technological bugs are a little distracting.”

“To date the technological challenges I have faced have been related to in-house difficulties.”

“The course is interesting and informative BUT there seem to be difficulties in communicating info via this new technology e.g. sound problems.”

“I found the audio more useful than the video [conferencing] - it’s distracting when people move around on screen.”

“I would like the class to begin at exactly nine am. I realise this technology is relatively new. However, I find it a bit frustrating waiting to get all the in-class technology working during the class time. Once everything is straightened up I think it is great.”

“It seems to me that the technological know-how needs perfecting as yet - much time is spent making ‘adjustments’.”

“The math module was irritating - technology-rich but info-poor - and too linear.”

“The prof was very good but she had more to give than we were getting because of the technology - it gets in the way of content flow and emphasis.”

“I liked the math module - you could scroll.”
Prior familiarity with e-mail helped the majority but it remained problematic for some, but chat lines proved a lot more difficult for the vast majority.
The use of bulletin boards proved much less problematic for the students in Iteration One, although this did not rank very high as a preferred technology. Bulletin boards were used as a means of communication between groups outside class sessions but were not as popular for this as e-mails and telephone calls.

This iteration was intended to provide students with a wide range of technology options for class and group activities. In the event there was a high degree of face-to-face contact outside as well as inside classes. This gave little incentive to try unfamiliar technology.

Students who were having trouble did not always use the help line facility. Some used family members to help them instead and some could not access the help line when they needed to because this was often in the very late hours of the day.

Much of the trouble shooting that took up the time of the technology support team was taken up with the video- and audioconferencing problems in class time.

The use of the technology in Iteration Two seemed to be easier for the students - only 4% of respondents found it difficult but some probing questions suggest that this may have been a rather optimistic assessment on their part.
While most of the students in Iteration Two said that they found the use of the technology easy, their more detailed comments (see opposite page) belied this to some extent. Some of the problems were server related and so had little to do with student computer skills.

The use of the chat line for educational purposes proved problematic. First, many of the group had poor keyboarding skills and this made it difficult for them to participate in a timely fashion.

Second, the lack of established “rules” for communicating in this way made for a poor development of conceptual ideas and arguments - the comments were fragmented and completely out of order.

Third, some students confused the use of their team chat lines with the class discussion line and team conversations impinged on the class discussion.
Comments on Technology in Iteration Two

a) world wide web

“hardware problems - freezing. Mode of search engines not specific or easy to get into your destination”

“confusing to find things”

“server ‘burps’”

“don't like waiting for images to come up - some search engines hard to use”

“confusing graphics - finding info (too much info?)”

“used the web for searching”

“using the web was OK for individual pieces but not good for integrating”

“difficulty in using research – computerized search techniques difficult – too many examples that were not relevant”

b) audio on web

“bandwidth was too high - since it was lowered it’s OK but sometimes it still stops & starts”

“audio cutting out”

“at times interrupted by net congestion (more at home via Compuserve than at work - no firewall)”

“hardware problems - was unable to hear at all times. Faster communications therefore need play back features after the live session”

“bandwidth was a problem – there was net congestion”

“not very clear - a lot of net congestion so it was difficult to keep up with the course”

“audio fading out or being drowned in static & being thrown out of server (‘server full’)”

“some re-buffering - frequent interruptions in the beginning but improving towards the end”
"not knowing how to increase the volume because no one told us how"

"can't access real audio on my system & sometimes sentences get interrupted @ Ryerson Lab"

c) video on web

"just slow sometimes"

"slow to download"

"could always be faster"

"did not use"

"too slow"

"didn't see any video, just still images"

"haven't seen any"

“problems with audio & downloading slides – very painful and time wasting”

"slide shows slow due to size of the picture files"

d) chat lines

“the chat line was difficult at the start then got easier”

“first time I had used a chat line but it was easy”

“hated using the chat lines in terms of group discussion – it was OK to enter questions for speakers – ideas were truncated & did not get well expressed – it was superficial and the typing was poor”

“had initial trouble with chat line – typing speed is critical”

“the chat line was kind of limiting for expressing yourself”

“slow keyboarders get lost on chat lines – some people didn’t understand the technology so they had a hard time”

“hated using the chat line – for group discussion it was ineffective, superficial, shifting, but it was good for questions”

“connecting to the chat line was difficult – they coached me but I couldn’t hook up to a chat line on my own even now!”
“I didn’t understand the technology and my typing speed was a problem so I was not able to participate”

“Discussion raised lots of issues but no solid closure since many discussions were happening simultaneously.”

e) bulletin board

“lot of net congestion using the bulletin board”

“the bb instructions were generally good but could have been clearer for 1st time users”

“I did run into problems posting assignments on the bb”

f) e-mail

“had technical difficulties with e-mail – needed tech support 5 times!”

“I had a problem with attachments – I could attach but it wouldn’t read at the other end – then I discovered cut and paste”

g) General

“some of the technology had glitches – we lost audio and the graphics were slow to download – the chat lines were too crowded sometimes – sometimes you didn’t realise you were logged out”

“I took a computer course first & have a computer at home”

“If something went wrong the course format wasn’t great for getting immediate help e.g. when the server went down, and getting cut off”

“2 systems problems – 1st Class – I needed to work with Sean to try bulletin and chat line – it would have been better if I could have had some technical training/practice and check it out”

“there wasn’t a class when students were using the technology without problems – had a sense that the internal system was stretched to the limit – there were times when the technology was more cumbersome than helpful – listening to taped lectures was no value to me, they tied me to my terminal (I hired a transcriber and then passed out the printed copies around the group)”

“I started this course because I felt I was losing touch with technology and falling behind. I had no experience whatsoever with bulletin boards/chat lines. I feel an orientation to this would have been helpful so that we could make the best use of the applications.”
Comments on Technology in Iteration Three

“It would have been helpful to know the server and the channel before we started arranging to chat - rookies like me don’t know you need to know this.”

“I could not find the audio (except for sound recorder) and had to download Cool Edit. [The person on the help line] was a good help.”

“I had problems in setting up for the audio on web.”

“As for the e mail, there were problems with other people having different encoding e.g. MIME format.”

“It’s challenge for me, it’s my first time with technology and I hope to enjoy it like a honeymoon ... is that possible?”

“No one in my group had video capabilities other than myself.”

“It has been interesting but distressing to find marketing cleverly disguised as information all through the ‘Net. I’m finally old enough not to believe everything I read in the newspaper; now I have to be on guard everywhere!”

“As for audio on the web, it is hard to communicate because of varying speeds of speakers’ computers. It should be most interesting when they get a few more bugs out.”

“Attachments are still giving me a little trouble but I’m getting better.”

“I really haven’t used the bulletin boards.”

I am intimidated by the chat lines because I don’t type well. Frequently I’ll type the answer to a question but by that time people are five questions ahead.”
Context

The context of the course delivery did have important impacts on the outcomes.

First it became very clear in the 2nd Iteration that the numbers of assignments generated really required extra academic staff input. Delivering a lecture at which students take notes has a much shorter time requirement than preparing for a variety of technology delivery methods, some of which, like synchronous chat lines require considerable time commitment in themselves. Add to that the time involved in making audio and video-taped interviews with guest speakers, dealing with innumerable e-mails and preparing information for web sites, and it becomes clear that providing the range of teaching methods and technology that provides students with a choice of learning styles is not without its price in terms of time required of teaching staff.

In addition, because of the relative lack of technological sophistication on the part of many students, the technologists on the course delivery team were also under pressure. The normal office hours are not sufficient for a help line accessed by students working mainly in evenings and at weekends.

Partly because of this lack of technological sophistication and partly because of other practical factors not directly associated with the technology, teamwork also proved to be problematic. For example, some students used their computers at work for team assignments, while others had to use them at home. This resulted in different times when team members could be available to each other, making synchronous teamwork next to impossible.

Access to the Internet also proved difficult due to company firewalls, problems with ISPs and other family members needing to use the computer.

Although the last iteration, which was totally asynchronous, should have alleviated some of these problems, in fact its students did not have as good a completion rate as the first two iterations. This may, in part, have been due to the comparative lack of human interaction,
which was found to be important to many students. While the professor made attempts to create a class “spirit”, many of the students did not respond, which was probably due to them experiencing problems with the technology.

Certainly the students had problems in responding to the questionnaires that were sent via e-mail, which was supposed to be a main communication method for this course. The problem of attachments appeared again and again. This was often due to early versions of software being used by students.

There is no doubt that, with more technical preparation for those not familiar with the technology, the learning context would have been vastly improved.

Obviously the more distanced and asynchronous a course becomes, the more the learning context becomes important and so does the availability of technical support. As one student from Iteration Two pointed out:

“Videoconferencing for personal interaction was not as important as I expected it would be from earlier courses but some form of synchronous interaction is a KEY ELEMENT in a distance course.”

This is one reason why the Open University in the UK takes such pains to help set up student self-help groups so that students can have as much personal contact as they feel they need. While the learning styles of some students are best met in more individual study, for most students it is clear that personal contact is an important contextual factor that must be addressed in virtual education.

Another important factor turned out to be the location where students studied, especially in relation to teamwork. From the interviews it became clear that some groups had to resort to very complicated combinations of communication methods and timing in order to complete team assignments within the deadlines. This was especially so in Iteration Two, which had a very clotted course content.
Iteration One

"How important is it to have face-to-face contact with your tutor?"

- Very important: 70%
- Important: 20%
- Not very important: 10%

“Did you feel able to make a personal contact with your professor using the available technology?”

“I would feel ‘disadvantaged’ when the instructor was at the other site.”

“ Asking questions on videoconference is awkward.”

“The Professor gave me the Maths book but I didn’t know what to focus on so I didn’t feel prepared for the Maths day.”

In this iteration the students had face-to-face contact with the professor. However, 30% did not feel it was all that important.

In fact the same professor taught Iteration Two using more distanced technology, and there was no scheduled face-to-face contact. This provided the opportunity of comparing the technology while controlling for the teaching variable.

How would students on that course react?
Iteration Two

“Did you feel able to make a personal contact with your professor using the available technology?”

“Yes but a bit grudging - not always helpful - explanations were a bit vague and the chat line was too crowded and sometimes you didn’t realise you were logged out.”

“It was enough of a presence on the chat line but not enough support for projects.”

“On the chat line slow typing meant that the prof had logged out before questions came up on the screen.”

“Not really; it was rather impersonal.”

“Not really. I think the professor would do better on a conventional course.”

“I knew her from previous courses so I can’t really judge this.”

“Yes - sort of.”

“There was enough of a presence for lectures and discussions but if we had needed more explanations then it could have been difficult, and there was not quite enough support for projects.”

“Not really but it was sufficient for the course. The prof was always responsive.”

“Yes.”

“I know her but I think you would feel remote in spite of the effort she made.”

“It was tough to begin with. We talked more after the course than during.”

“The prof was patient and responsive - I must have sent more e-mails than any other student!”

“Overall I still prefer live instruction with the spontaneity that helps the learning process. If teachers could instruct on-line with audio, it might provide for a more common learning experience. At times ‘the medium being the message’ is a bit overwhelming without ‘human communication.’”
Access to Internet - Location

- At home: 66%
- At work: 28%
- At both: 6%

Iteration Two

Study Habits - Location

Iteration Two

- Mostly at home: 56%
- Mostly at work: 22%
- At home and work: 22%
“I worked at home because I had time off work for study.”

“A home-based course would be easier in many ways but I don’t have a computer at home.”

“This is a big challenge - finding enough time - especially for the group work. I have a laptop at home but it’s so slow I have to stay after work to get web access.”

The student responses about their location of Internet access is confirmed by other research that SLA has conducted in 1998. There is a big problem in employee access to Internet at work, especially in the retail industry. Most companies have firewalls that cause problems for providing Internet access at work. Although some companies will provide Internet access outside the company firewall, this is too big an expense for many.

The latest available statistics indicate that home-based Internet access is rising rapidly, while many companies are going the intranet route, which is easier for them to control. One problem highlighted by the third quote above is that home-based computer hardware may be less state-of-the-art than that available at work. This disparity is another headache for designers of virtual learnware.

*Where* students on Iteration Two studied was not generally a matter of choice but of necessity - wherever their computer was located. While the majority had access to a computer mostly at home, the fact that almost as many were using computers at work made for problems in synchronous on-line teamwork. *(See later section.)*

The combination of a variable computer access location and time of day (or night!) available for study are important considerations for designers of virtual courses if synchronous elements are planned, and especially so if this is to encompass teamwork.

Continuing education students, who are taking courses in addition to working full-time, have particular stresses that may need accommodation by course designers and accrediting institutions. The following information about study habits and problems should be particularly useful and more market research needs to be done in this area.
Comments on Study Problems and Possibilities

“The course was very fast-paced, and at times it was difficult to keep up with my regular job & family life. Too many assignments due too soon.”

“Because the workload was so heavy it was difficult to take extra time to follow up interesting issues or technology.”

“I found the workload too unrealistic. There was not enough time to learn the written materials, execute your own search and write the assignments that were proceeding one after another.”

“I was lucky because I actually had some time off.”

“I worked right through every evening.”

“I worked VERY early in the morning mostly and just a little in the evening.”

“I worked LATE into the evening and I mean LATE!”

“I worked ALL weekend.”
“I had to work in the week because my husband uses the computer at weekends.”

“I could settle to study with no interruptions at the weekends.”

“Studying did affect my work. I had to work late hours and study at the same time to keep up, but I was lucky in that I don’t have a wife or family.”

“My study was interrupted by illness, family and Christmas!”

“I had three days off and no family so it wasn’t too bad.”

“I didn’t have a problem - my employer and family were supportive.”

“Two members of the family had heart attacks during the course, but I just came in early in the mornings and worked every evening starting at 5 pm. On Sundays I had family responsibilities so I couldn’t study.”

“Work wasn’t a problem but the family was.”

“Both work and family were intrusive - I just had to work longer to cope.”

“I was coming to work too tired and I had to put aside the family - my parents are nearby but my mum began to complain.”

“There was so much study it impinged on family life.”

“I have less sleep, I have to balance my priorities but I’m getting support from my company.”

“I’m getting good support from my company (time off and money) but we had an expected full review sprung on us and that was a killer.”

“I have found it difficult to find enough time to keep up with the reading that I find interesting and I’m driven more by interest than having to do well on the course.”

“It’s not easy balancing all the duties and studying. We had stock taking in the middle of the course and that made things very difficult. I surf the web at home but we have to have group meetings during work hours on breaks.”

“I was stressed out by the third week - time pressures were enormous.”

“Work had to come first, the course second and family becomes three - I had a lot of support from my husband and store manager.”
“I couldn’t put the course before my job and family can only put behind for a while.”

“I was disappointed that the ‘distance’ portion of the course only extended to two sites, both based in Toronto. I was hoping to spend less time in a formal classroom, even via videoconference, and more time in self-study.”

“Scheduling a course midweek is extremely difficult when you work in retail.”

“It is important not to let technology get in the way, as it does sometimes. Personally I like the concept of home-based study using the Internet for research, with print as a back-up.. I also like the idea of using video-tapes. For group work perhaps set up teleconferences.”

“The library is my first impulse for private study but I am getting more accustomed to the Internet. I am happy to work on my own but I do enjoy meeting other people and I like experienced based learning.”

“I was commuting every week to the course and it was too much with the course workload and at work - so I hope the next course is on-line.”

“I like the varied format and I couldn’t always remember the medium over the content.”

“The value of group study is being able to ‘brainstorm’ and you can only do this in real time.”

“It would be useful to have technical support that could come to you - studying at home means you are away from this sort of help. I expected more support from the company MIS people but other company priorities had to come first.”

“I would have found a one week intensive course better - you can concentrate on nothing but the course.”

“It would be better to have class sessions every other week to leave time to complete assignments and do some interest reading around the subject - I don’t like feeling rushed all the time.”

“I would have preferred to have the materials at least a month before the course started.”

“I like to see people face-to-face or at least be able to view them somehow - I like to watch people’s expressions and movements. You lost a lot of the body language over the videoconference and you
only had the tone of the voice to go by in audioconferences.”
“...only at work, this course might be a little heavy to combine with work, now knowing all the research that had to occur to complete the course.”

“It was a lot of work but I was taught to divide life into sectors and if each is balanced a whole comes together.”

“I like being able to ask questions of guest speakers - it makes the course much more interesting.”

“It was a big frustration for me that I couldn’t communicate with the group via computer, due to technical problems, and they were such a good group I felt I was missing valuable learning.”

“My mode of choice would be to take a week in a hotel and ‘blitz it’ and if not that then every other week for taking in information or for doing assignments.”

“For me it’s very important to meet the other people on the course and it’s very difficult to do it at home - I have to blend it in with my working day.”

“I’m most comfortable with a combination of all the technology - though if I did this from home I would need some time to prepare for them.”

“Class chat sessions of two hours is too much - that could be cut down in favour of more private study time.”
Outcomes

As the technology allowed for more distance between teachers and students, in terms of both place and time, so the student completion rates of the courses became increasingly less than 100%. This is partly accounted for by the fact that the asynchronous course - Iteration Three - allowed for longer cutoff times for the completion of assignments, and some students were still officially on the course but not completed when the evaluation came to an end.

Possibly the most difficult goal to accomplish with distance technology is teamwork. While students had a variety of technologies to choose from for communicating with team members, this was not always viewed as a satisfactory experience unless they could meet face-to-face. Nevertheless, students still felt that the output from the team was of better quality than they could have achieved individually.

It is also a great challenge for teachers to provide satisfactory interaction with students at a distance, given that students set great store by being able to meet with their instructor at least once in person on a course.

Preparation for technology-enhanced courses needs to be meticulous if students are to achieve their teachers’ and their own goals. For example, in Iteration Two, the Professor had not sufficiently thought out the essential difference between using chat lines for informal communications and using them for concept development and analysis of issues, and so the experience was less than satisfactory for most students. While the technology gave the opportunity for students to participate at will, it also demanded more detailed preparation on how this would translate into a meaningful exchange of ideas at an acceptable academic level.

In addition, if students are not technologically sophisticated, there needs to be some form of technological orientation or prerequisite course before they are required to use the technology for assignments or class work. This is doubly important where team assignments are a part of the course. If this is not done, then the technology acts as a barrier to learning instead of an exciting bridge to it.
From the responses it was clear that by Iteration Two the use of the web to learn important facts, skills and attitudes (e.g. confidence!) had increased over its use in Iteration One, where more technology options were available and the use of the web could be avoided.

What is clear from the observations of the evaluators and the comments from the students is that technology, while providing great possibilities for reaching more students at times more suitable to them and for fostering self-paced and directed learning, demands meticulous planning and detailed research into the conditions in which it will be used if it is to produce successful educational outcomes. In fact, in relation to the use of technology-enhanced education, the organization was on as high a learning curve as the students.

The project was deliberately designed to flush out the problems of designing and implementing technology-enhanced education on a continuum of increasing distance and asynchronicity and it certainly achieved this objective. The feedback from this research has already informed the re-design of existing courses and their future implementation, as well as new course design for the rest of the Certificate and Degree courses in Retail Management.

For example, Ryerson is now designing a prerequisite course for those students who need more practice in the use of computers and Internet before taking on-line courses.

Another factor in providing successful outcomes for on-line courses may rest in the provision of human contact for those students whose learning styles are not well-served by totally self-directed study in isolation from other students. This could be achieved by incorporating the use of local student support groups for those who live near enough to each other to meet face-to-face during a course. This is likely to become more viable as student numbers increase. In the meantime, and for those who are too remote for this possibility, ingenuity in the use of the technology to provide a more human face to on-line learnware needs to be explored.

The following findings will hopefully provide a focus for these activities.
Comments on the Technology

“I felt that ideas did not get as well developed over the chat line as they do in a class, although I think participation was higher.”

“The technology frustrated me - it should have been set up for everyone (e.g. e mail) BEFORE the course.”

“It was a real struggle with the technology at the beginning. Either it should be spelled out as a prerequisite that you need to have USED computers and the Internet before the course OR you need to have a month’s orientation before the course starts.”

“My only concern is that the communication between classmates is limited.”

“Technical support needs to be there even after hours.”

“I need visual stimulation like video-tapes.”

“More information about the technical requirements is required up front. Many of us were 1st time Internet users - with so many different service providers, it’s important to know what search engines etc are going to be used. I’ve had significant problems looking up with Sympatico because I’m using an OS/2 platform to run Windows 3.1. Better orientation to the technology would have been helpful. I felt it was very difficult to speak spontaneously - video time delay/audio quality.”

“I’ve always used computers at work but I was new to the Internet. I liked the videoconferencing but I have got more comfortable with the web.”

“I enjoyed the technology even though there were problems with it. I like visiting the different web sites.”

“I think you need to match the systems to the purpose. For example, Perhaps use videoconferencing only for group presentations. Use audioconference for a lecture, perhaps after a video-tape. Use print for research and use e-mail and telephone for group study. I did access the bulletin board but I didn’t really use it.”

“My problems were mainly technical so I did not spend much time on the Internet. It was very difficult at the beginning and I relied on the fax and phone. I did use the bulletin board - eventually! - but not the chat line.”

“I did enjoy experimenting with the technology and getting it to work.”
“The technology frustrated me but I got very comfortable with the web, which was new to me at the beginning of the course.”

“I had difficulty with no previous experience of the technology and I wondered ‘Can I do this?’ but in the end I enjoyed everything including the Internet.”

“It was a real struggle with the technology at the beginning but I found learning on the web invaluable.”

“I like to meet the other students but the web has certain advantages - you don’t prejudge people and you’re not so shy.”

“I’m not a tech person but once I understand what I’m doing I’m OK. I don’t have a computer at home so I had problems at first but I used the help line 3 or 4 times and I’m becoming fluent with the Internet.”

“Some people didn’t understand the technology so they had a hard time. Slow keyboarders get lost on chat lines.”

“It was the first time I had used chat lines and I enjoyed it - it was exciting exploring the web.”

“Definitely videoconferencing for personal interaction was not as important as I expected it would be (from taking previous course) but some form of synchronous interaction is a KEY ELEMENT in a distance course.”

“I have become very comfortable using the web now.”

“I really enjoyed using the web (I’m not sure my wife is so thrilled!)”

“Discussion raised lots of issues but no solid closure since many discussions were happening simultaneously over the chat line. We needed clearer protocols or ‘netiquette’ so that this didn’t happen.”

“It was exciting to learn about the technology but it was also frustrating and anxiety producing.”

“In the first class I felt panic because I had no experience with chat or audio. If we could have had a quick chat session to know what to expect it would have eased us in.”

“I feel deprived now that the bulletin board and chat lines are gone!”
Teamwork is an important part of many courses, especially those that are related to work. It proved quite a challenge in the context of the increasingly distanced course delivery.

While asynchronous communications can help solve some of the problems, it also creates others. For example, synchronous communication demands an immediate response and to some extent this aids the perception of being part of a group. The response to asynchronous communications can more easily be postponed or even totally ignored and this can heighten the feeling of isolation from a group or “class”.

Certainly as the courses became more distanced and asynchronous the completion rate dropped. This is in line with the general tendency for course completion rates for distance education to be fairly low [Rumble (1992)]. On the other hand, as Rumble points out, course completion may not be the best indicator of success for distance students, who quite often drop back in again if the institution allows for this.

It is also important to remember that work-related causes are most frequently cited as an important reason for drop out of distanced students and it was clearly demonstrated how stressed some students became on the courses under evaluation in this project.

However, an important way of reducing dropout rates is to maintain interest and motivation by encouraging “continuing membership of a learning group or ‘club’ of learners.” So group work, while problematic to organize in a distanced setting can be an important factor in successful outcomes.
Are you satisfied with your team interaction?

- Yes: 44%
- No: 56%

Did people in the team make equal contributions?

- Yes: 44%
- No: 56%
What was you favoured technology for teamwork?

- Telephone: 18%
- Chat line: 27%
- Email: 55%

How was the team output affected by the use of distance technology?

- Better: 22%
- Worse: 78%
Did you group meet face-to-face for team assignments?

No 44%
Yes 56%

Was the team output better than you could achieve on your own?

Better 67%
Worse 22%
Varied 11%
Comments on Teamwork

“It was too tight a timeframe for group work. Our work/home hours were incompatible and this led to time delays.”

“I was stuck with an unexpected full scale review at work. We haven’t communicated well as a group for assignments.”

“I enjoyed the teamwork and the exchange of ideas but the assessment is more difficult some people did not do their reading and depended on others for information. Why not build in more individual assessments of group work?”

“It was a problem getting together as a group but the course would lose a lot if there was no group interaction.”

“If the course was totally home-based it would be important to meet other students as a group at some time.”

“Too much group work that is inefficient when done over the Internet. We are all busy, working employees, some with children and it is difficult to meet in person. This leaves the Internet communication option, which can be held up by technological problems outside our control.”

“Too much distance team work.”

“Interaction with a smaller group will be important if the course size is (say) 300 students.”

“We didn’t form a team in the traditional sense but still a commitment to each other that created a team spirit (cohesion) - it felt different but it’s hard to put one’s finger on it.”

“We had a fabulous mix of people.”

“My group did meet in person to discuss group projects (due to very restricted access to computers) and we especially enjoyed our face-to-face meetings. I do not think we would have worked as well together if we had not met.”

“We met a lot - we booked every Tuesday for doing assignments.”

“Only two of us met.”

“We had one meeting (less than 15 minutes) just to exchange telephone numbers etc.”

“We didn’t meet until it was all over.”
“We had to meet face-to-face. It was our basic method - only one of us had a computer. We didn’t have one class where everyone had a computer and several of us had typing difficulties.”

“It was about 75% face-to-face.”

“We met weekly.”

“The undergrad students didn’t always pull their weight.”

“We had a good mix of people - it’s almost transparent in this format.”

“Interaction was not fully achieved - undergrad students said they had other course pressures.”

“It was OK at first then I felt ‘badgered’ by a leadership role.”

“The mix was good. As the only ‘industry’ person I did feel a certain responsibility to lead but the experience was enriching - I would have liked another professional in the group, preferably from another company.”

“It was the most frustrating part of the whole thing - schedules did not mix.”

“There was a problem - the undergrads had tons of other assignments and this affected their group work - this was not their fault.”

“Our mix worked very well.”

“We met face-to-face a lot but we also used the chat line.”

“We used e mail the most but we also used the chat line.”

“We used e mail the most and then the phone but we also used the chat line on at least 4 occasions - between 6 and 7 in the evenings because this was the only common time.”

“We used e mail most and the phone - we only used the chat line for a bit - not much after class.”

“We used the phone always, e mail often, and sometimes the chat line in the evenings.”

“Face-to-face was our basic method - we used the phone a little to set up appointments.”

“We used chat line and e mail the most and the phone a little.”
“We used the chat line all the time and then e mail but mostly face-to-face.”

“We met face-to-face most and then e mail followed by the phone for problems.”

“The undergrad students always had something to do when we needed to meet and they sometimes did not pull their weight.”

“A couple were not really involved but two students did a lot - one had leadership qualities and she delegated but they didn’t make use of my retail experience.”

“Did people make equal contributions? In truth, no.”

“The undergrad students made too little contribution - the sense of urgency was not there - it was not totally their fault - students haven’t learned that deadlines can’t be extended - working in dyads would be better - more manageable.”

“Individuals had problems - they had tons of assignments and this affected their group work - not their fault but some made more effort than others.”

“It was pretty close - I was clearly the weak link. I think this was not meant to be the first course you should take - they knew the jargon and I didn’t.”

“It was hard to say whether our output was better as a group than if we had worked individually - we got great marks sometimes and not others and we didn’t understand why.”

“I think our group work was a little worse than if we had worked individually - the chat was difficult - but D and I did one together and that was better.”

“‘We needed a bit more time than we had to be really good - we are all busy people - It wasn’t a factor of the technology.”

“They came up with some good ideas that were useful.”

“It was better from the stimulation - this compensated for the imbalance in contributions.”

“You can always learn from other people.”

“I would have been dead in the water without it.”

“It would have been tough doing assignments not face-to-face.”
“The distance technology was convenient.”

“We worked better face-to-face - we had concrete output - the problem with distanced communication was timing (time delays) - that was a problem.”

“I can’t imagine providing work of any quality if we couldn’t meet face-to-face - we had a problem coordinating times when everyone could get together, whether distanced or face-to-face.”

“This is hypothetical because we DID meet face-to-face - but I wouldn’t mind videoconferencing.”

“’We would have needed conference calls if we hadn’t met face-to-face - e-mails stretch communications too long but they are good for clarification. There was a lot of redundant communication because it was too late and I was slow at keyboarding.”

“I found the group work challenging. First there were problems working round other people’s schedules. Everyone else in my group worked downtown so I travelled there - I got home at 3 am one morning! I was very lucky in the other people in my group. I always want to do the best I can so I would feel strongly if my mark was pulled down by others. It’s chancy if you don’t have a commonality of level or aim. Some time is needed in the class session for group work - the more the better.”

“Our group assignment has been a real challenge because two of our members seem to have disappeared into cyber space - and at this late date we expected them to have their part of the assignment complete.”

“I had difficulties working with group projects, trying to get all the group members together, specifically working with different time zones and work schedules. It was difficult getting the group members to respond on time and get them together for chat times.”

“Group work is extremely difficult on the ‘Net because personal and work schedules are so difficult to coordinate. The telephone is more intrusive and demands immediate attention: while e-mail can easily be put off. I think net meeting using audio is a step in the right direction but only because two people can be connected at a time. We need conference calls on net meeting.”
One important goal for the institution was to provide courses that would have the right content at the right level and that was relevant to the retail industry. In this respect the courses could certainly be termed successful.

For the students, comments indicated that the content had been both interesting and informative and the variety of technologies provided were used to the full in their learning. As the courses progressed the use of the web or a whole range of technologies took over from video-tapes as the most used technologies for acquiring important learning points. This was also probably related to students’ increasing skill and confidence in using the web-based technologies.

In considering successful outcomes it is also important to remember that these may be less tangible than completion rates and high marks for assignments. As one student commented:

“A lot of people - me included - get far more from a course than would show just from submitting assignments.”
Course Content Level of Difficulty

- A little too difficult: 18%
- About right: 82%

Level of Course Interest

- Interesting: 44%
- Very interesting: 56%
Course Content Useful to Retail Industry

- Don't know: 13%
- Very much: 13%
- Yes: 74%

Course Content Relevance to Job

- In part: 25%
- Very much: 25%
- Yes: 50%
"What were the three most important things you have learned on the course and through what technology did you learn them?"

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<tr>
<th>Important Learning</th>
<th>Technology</th>
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<td>Customer is key</td>
<td>Video-tape/Videoconf.</td>
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<td>Impact of new formats</td>
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<td>The change in technology going on in retailing</td>
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<td>The importance of electronic commerce</td>
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<td>Retailtainment</td>
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<td>Working with a group</td>
<td>Everything</td>
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<td>Learning to use the technology itself</td>
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**Further Comments about Content**

“I loved the Retail Shopping ‘Supermarket Crusader’ video-tape - it was visually exciting, fast-paced and newsworthy."

“I really enjoyed the special segments on local markets."

“It was all valuable but the Retail Competition was especially useful. The information on other retailers can’t be obtained anywhere else."

“The overall content was good - I particularly enjoyed Harry Rosen, the Walmart case study and the stats on the retail sector.”

“I liked the research on Trends and using the Internet."

“I will take away from the course valuable info on retail that I didn’t know before: some North American terminology; advancing technology in retail; what other companies are doing; - not to mention contacts with other people that will last."

“The content was excellent - so rich in detail - I had no background in retail and it opened my eyes."

“It was a satisfying level - I learned new things but it built on existing knowledge. The most important to me were the retail maths and information on buying."

“What I learned was more general like working with groups."

“I learned statistical facts that I didn’t know, a better understanding of retail maths and then there was the computer side - the Internet was all new to me."

“The content was fabulous."

“It showed us how challenging the retail situation is.”
Comments About Course Relevance

“The part about globalization of retailing and how other countries operate, as well as how the use of technology is growing, was very much relevant to my job.”

“The technology was especially relevant to my job and on a broad spectrum you could pick ideas.”

“Yes it was valuable in that it dealt with a lot of important issues.”

“Learning the use of IT in retailing was most relevant.”

“The case studies were relevant to my job.”

“The course was not relevant to my job in terms of what I will do tomorrow morning but it put it in context, and there was a lot of useful info on other companies.”

“It was extremely useful to learn all about the challenge of retail.”

“It was relevant to the industry because it showed us how challenging the retail situation is.”

“It showed me how to communicate better with my stock analyst, and my buyer also learned from me - between us we speeded things up and increased sales significantly over the previous year.”

“It had a lot to do with retail technology and it fitted perfectly.”

“Absolutely - I have been using it.”

“It was especially relevant at two points - first in seeing the potential for technology (especially push technology) for our agency - and second it was helpful in having to think through some concepts in retailing such as ‘retailtainment’.”

“The content was a great eye-opener - it provided a good understanding of the complexities of decision making in retailing.”