The Problem of Computer Conferencing for Distance-based Universities

David Annand of Athabasca University, Canada in this article suggests that interactive group communication technologies like computer conferencing deindustrialise the distance education process and hence increase costs. This significantly constrains the adoption of these technologies in distance-based universities, more so than resistance to new constructivist learning models which computer conferencing supports. Defining characteristics of one undergraduate and one graduate programme at Athabasca University are described to substantiate this argument, and implications for distance-based and conventional universities are discussed.

It has been suggested that computer conferencing is the primary technology that supports ‘post-industrial’ learning at a distance. Post-industrialism is an emerging worldview informed by constructivist learning theory (Garrison 1997: 3). A typical version of the constructivist worldview ‘assumes that entities we normally call reality, knowledge, thought, facts, texts, selves, and so on are constructs generated by communities of like-minded peers’ (Bruffee 1986: 774). These social constructions are often multiple, conflicting, and all potentially meaningful. Their relative explanatory value depends on which is the best-informed, sophisticated, and generally-accepted at a given point in time.

Constructivism suggests that individuals create their own understanding of the world and that this process significantly affects how they subsequently interact with it (Young and Marks-Marlan 1998: 31). Authentic communication, negotiation of desired learning outcomes between learner and instructor, the construction of shared meaning through dialogue, and validation of understanding within limited contexts are essential components of a constructivist learning model (Guba and Lincoln 1982).

Computer conferencing is particularly supportive of constructivism compared to many forms of distance education which provide individualized homestudy and rely heavily on printed materials. It increases interaction, allows collaborative learning strategies to be used, and facilitates critical discourse and construction of new understandings among participants through

1 Distance-based universities are defined as universities where education is predominantly transacted at a distance and which have separate governing structures including chief executive officers.
the asynchronous group communication processes it supports (Garrison 1997: 5).

Garrison suggests that the post-industrial learning model has not been applied extensively in distance education to date because of resistance from some educators, but that this resistance will eventually be overcome with the advent of cost-effective Web-based communication and information networks. As a result, he predicts that ‘computer conferencing will become not only the defining technology of post-industrial distance education but will pervade conventional higher education’ (1997: 9).

This article takes issue with Garrison’s position and argues that widespread use of new interactive communication technologies will not occur in the foreseeable future – at least within distance-based universities – because the post-industrial learning models these technologies support is not as cost-effective as present industrialised models. Communication technologies that support group interaction at a distance deindustrialise the distance education process, change cost behaviours, and increase overall instructional costs. As discussed below, these economic effects may in fact be more of an impediment to change within distance-based universities than resistance on the part of some educators to learning models informed by constructivist concepts.

The Economic Implications of CMC

Based on Nipper’s experiences at Jutland Open University, it appears that distance-based universities can progress through three distinct phases of change or ‘generations’ – study by mail; the use of print, audio-visual, or broadcast media supplemented by limited telephone tutor support; and the use of interactive technologies like videoconferencing or computer-mediated communication (CMC) to provide more interaction among learners and between learners and instructors (1989: 63).

Peters suggested that second generation distance education in particular employs industrialised processes. These differentiate labour among course development, production, and
instructional functions and allow knowledge and skills to be transmitted in a cost-effective manner to much larger numbers of students through the production of standardised, carefully-structured media. This, he argued, turns knowledge into a mass-produced, affordable, and widely available commodity. Learning theory underlying industrialised distance education is essentially prescriptive and generally behaviourist in orientation (1983). Peters’ ideas were criticized by various writers (for example, Rumble 1995). Still, Peters maintained that university distance education in its most important forms continues to be characterized by highly industrialised, technically-mediated processes while conventional, classroom-based universities in essence remain orally-based (1996).

Bates noted that industrialised distance education processes incur relatively high fixed costs to produce print-based instructional materials, but relatively low per-enrollment variable costs to provide academic support to students. This cost structure facilitates growth, as additional registrations in existing courses incur relatively small incremental costs (1991: 12). Growing enrollments can therefore create significant additional net revenues.

Bates also stated that the transition to third generation distance education incorporating electronic communication technologies can shift relative levels of expenditures among instructional, production, and support costs. Although relatively fixed production costs may decrease as reliance on the technology needed to produce print-based materials gradually declines, the increased interactivity afforded by new technologies like computer conferencing means that instructional costs – for example, payments to conference moderators – will increase in relatively direct proportion to the number of students enrolled. As Bates noted, new interactive technologies ‘require highly skilled teachers, and in large numbers, if high levels of interactivity are to be maintained at a social level’ (1991: 14). This increase in per enrollment costs, when coupled with growth, suggests that the costs of adopting a post-industrial learning model in a distance-based university will eventually exceed those of an industrialised model. As a result, evolution to third-generation learning systems by distance-based universities will be constrained by economics.
Evidence is presented below to support these contentions, based on the experiences of the Centre for Commerce and Administrative Studies (CCAS) at Athabasca University. This Centre developed a 120-credit on-line Bachelor of Commerce (BComm) programme which commenced in 1996.

The Virtual Teaching and Learning (ViTAL) Initiative

Athabasca University has offered undergraduate distance education programmes for about 25 years. The underlying instructional model consists of individualised homestudy using paper-based learning materials. Learning support is provided to students by the use of telephone tutors who are generally available in three-hour blocks once per week. The educational processes of the institution exhibit the second generation industrialised characteristics described by Peters (1983).

The ‘Call Centre’ concept was introduced in 1994 by the Centre for Commerce and Administrative Studies (CCAS), an academic unit of Athabasca University with about fifteen full-time professors. The Call Centre was designed to improve service to CCAS students and to reduce instructional costs, since payments to telephone tutors were one of the Centre’s largest expenses. Under the Call Centre model, students in any course are able to call a toll-free central telephone number five afternoons and six evenings per week. This provides about 40 hours of telephone assistance each week to students. Students first speak with ‘facilitators’ rather than directly to academics. If the facilitators are unable to help the students, their questions are forwarded by telephone or e-mail to applicable faculty members or part-time academic experts (former tutors) for assistance. These academics then contact students directly.

The facilitators handle a number of routine queries from students. In this way, academics field only substantive course-related questions or problematic administrative issues. Prior to this, part-time telephone tutors had directly handled virtually all telephone calls from
The Call Centre concept has allowed academics to use their time more effectively, primarily by eliminating routine queries to them and by increasing the average number of students handled per staff member. Facilitators now handle calls from about three times as many students per week as an average telephone tutor did previously. As a result, student support costs have been reduced by approximately $100,000 annually in the Centre’s undergraduate homestudy courses.

An information system developed using Lotus Notes® software helps the facilitators and academics track and resolve student queries. This information system also served as a model for the creation of an electronic student learning environment called ViTAL (Virtual Teaching and Learning) which provides electronic versions of previously print-based instructional material to students in the Centre’s undergraduate programmes. In the ViTAL model, electronic versions of study guides, assignments, and other print-based instructional materials produced by Athabasca University are enhanced with hypertext connections, links to Web sites, and, in some cases, computer-based instruction modules.

ViTAL students complete assignments using a variety of word processing, spreadsheet or other software presentation packages and transfer these electronically to facilitators or faculty members. Instructors can mark these assignments on-line and embed comments in the text of the assignments. In some cases, they also include audio and video clips, and active links to applicable ViTAL learning material or World Wide Web sites. Students can access library information and information about their assignment and exam marks on-line. Modified versions of the Call Centre’s ‘frequently asked questions’ databases have also been provided to ViTAL students.

The groupware capabilities of Lotus Notes® allows ViTAL students to participate in electronic computer conferences or communicate privately by e-mail with each other, the Call Centre facilitators, part-time academic experts, and full-time faculty members. Documents, graphics, and sound clips can also be attached to messages. Both ViTAL and regular
homestudy students can still communicate by telephone with facilitators during the usual Call Centre hours of operation.

Development of the ViTAL learning system commenced in 1996. The process has been efficient and inexpensive. The cost of converting approximately 40 of the Centre’s BComm courses to ViTAL over the past three years has totalled $50,000, or an average of about $1,250 per course. One-time investment in computer hardware and software amounted to about $16,000. Most of these conversion and one-time costs have been funded by internal and external research grants.

Annual fixed costs to operate the ViTAL system amount to approximately $90,000 per year. This consists of salaries paid to a course production manager and two technical support staff. Additional variable costs per student amount to about $15, consisting of the costs of Lotus Notes® and ViTAL user manuals, and a CD-ROM containing the Notes® software and ViTAL databases. ViTAL course enrollments are increasing and totalled about 450 for the 1998/99 fiscal year. Cost savings realized by the earlier introduction of the Call Centre have covered most of the ongoing costs needed to operate the ViTAL learning system within the Centre for Commerce and Administrative Studies.

However, despite significant learning enhancements incorporated into the ViTAL courses, there is a continued absence of significant interaction among learners and between learners and instructors. This occurs for several reasons. First, students are permitted to begin all ViTAL-based courses at the start of every month and the average number of active students per course is still relatively small. Thus, it is often difficult to establish a critical mass for conferencing activities.

Second, the on-line courses generally retain the same instructional design characteristics of existing paper-based homestudy courses. Purchased, print-based instructional materials such as textbooks are still sent to students. On-line material such as assignments, readers and study guides are essentially the same as their paper-based counterparts.

There are two primary reason why instructional design remains unchanged: Academics
are generally unwilling to design and maintain essentially two versions of the same course without additional resources. Also, they are reluctant to assume computer conference moderating duties on top of their existing workloads.

The additional costs of incorporating a post-industrial learning model into the undergraduate ViTAL learning environment are unknown at present. However, these costs can be estimated by analysing the relevant costs of operating the Master of Business Administration programme at Athabasca University.

The Athabasca University MBA Programme

The on-line Master of Business Administration programme offered by Athabasca University commenced in 1994. The programme is administered by the Centre for Innovative Management (CIM), a separate, for-profit unit of Athabasca University. There are several similarities between this programme and the undergraduate BComm programme. For instance, the electronic learning platform used by both is Lotus Notes®-based. The MBA instructional model also provides graduate student assistants to handle many of the routine administrative queries from students, similar to the ViTAL/Call Centre model.

In contrast, however, the MBA model incorporates fairly extensive computer conferencing and other forms of electronic communication to encourage interaction among participants, and hires part-time instructors to facilitate these interactions. The budgeted payments to the MBA programme’s on-line course instructors for moderating and other administrative duties (and omitting marking duties) amount to about $310,000 for the 1999/2000 fiscal year. Based on total estimated course enrollments of 3,000 for the same period, the budgeted cost of facilitating on-line interaction in the MBA programme averages about $100 per enrollment. If these costs can be extrapolated to the undergraduate BComm programme, the per-enrollment costs of providing similar on-line interaction would approximately double student
support costs incurred by the current ViTAL/Call Centre learning model.

This amount may be reduced somewhat because the pay scale for undergraduate instructors may be lower. However, the analysis also assumes that existing full-time faculty will be able to provide oversight to an expanding electronic BComm programme. It also ignores the costs of redesigning the present ViTAL courses to incorporate more interaction. The budgeted cost of developing and maintaining about 20 on-line courses in the MBA programme is $75,000 for the 1999/2000 fiscal year.

It seems clear that the cost of implementing a more interactive on-line undergraduate programme will create significant new net costs for the Centre for Commerce and Administrative Studies and Athabasca University as a whole. The MBA programme has been able to afford the costs of increased interaction because it has the economic wherewithal to do this. Tuition for MBA courses is approximately twice that of undergraduate courses and the programme needs to maintain only one type of instructional delivery system.

In contrast, enrollment levels in relatively large paper-based, telephone supported undergraduate programmes need to be maintained in order to ensure stable tuition revenue and government funding levels for the institution as a whole. Two production modes need to be maintained because instructional materials need to be developed to service both print-based and electronic courses in undergraduate programmes like the BComm. Further, the government limits undergraduate tuition fee levels, and differential fees for new forms of electronic courses and programmes are not permitted. As a result, the undergraduate programmes at Athabasca University lack the necessary revenue streams and organizational freedom to take full advantage of emerging forms of interactive electronic communications.

Implications for Distance- and Campus-based Universities

Extrapolating the Athabasca University experience, it appears that distance-based
universities face a very real problem: Evolution away from industrialised distance education models – whether paper-based or electronic – will likely be constrained by economics. High fixed costs will be incurred to develop more interactive courses and variable costs per enrollment will have to increase to facilitate this interaction. These factors, coupled with projected growth, dictate that present budgets of most distance-based universities will likely be insufficient to develop and maintain the broadly based electronic learning systems that are needed to support truly post-industrial learning models.

Increased tuition fees might provide some of the revenue that is needed. It is also possible that additional grants will be provided by funding bodies to support large-scale, ongoing electronic learning initiatives. However, the cost/benefit tradeoff between an existing, less-expensive industrialised learning model and a more expensive, arguably superior post-industrial learning model must be addressed at some point by these funding bodies and university administrators in general. Managers must carefully consider the extent to which a distance-based institution which currently uses industrialised educational processes can commit to developing large scale educational programmes informed by post-industrial learning models.

Garrison suggested that the post-industrial model will find increasing acceptance because the costs of emerging Web-based communication technologies which support it are decreasing and interactive capabilities are increasing (1996: 7). Based on the foregoing analysis, this appears doubtful – at least in a distance-based university setting – because his analysis ignores some of the most significant costs of providing electronic interaction. If post-industrial learning models are to gain wide acceptance, they will have to be refined at some point to reduce the costs of their implementation. For instance, on-line moderating duties and practices may need to be re-examined in order to use instructor resources more effectively, or lower-paid graduate students may have to be employed more extensively as on-line facilitators. More unstructured, fluid and direct student-to-student interactions could be encouraged, in contrast to the more formalised, ongoing, instructor-moderated interactions often found at present in on-line learning environments. These factors obviously impact the conduct of learning in distance-based
universities and warrant further study.

Garrison’s predictions may be relevant to conventional campus-based universities, but not because of the inherent pedagogical superiority of post-industrial learning models nor the development of more effective forms of electronic communication technologies that support them. Rather, as Kaye suggested, the extensive adoption of group-based electronic interaction like computer conferencing could be relatively less expensive to incorporate in campus-based programmes that already have low student to teacher ratios, do not need significant amounts of specially prepared print-based or other instructional material, and do not require face-to-face meetings. In these cases, the introduction of electronic learning systems could mean that fewer classrooms would be needed. This reduced need for physical space and commensurate reductions in related infrastructure costs might more than offset the additional costs of providing significant on-line interaction (1989).

Thus, it is questionable whether the adoption of more progressive post-industrial learning models is inevitable with the advent of newer forms of interactive electronic communication. Economics will play a deciding role, and on this basis post-industrial learning models and their enabling technologies may be more successfully adopted by classroom-based universities than by distance-based ones. As we proceed into the 21st century, managers of distance-based universities need to come to terms with this issue to successfully evolve into full scale next-generation distance education providers.
Bibliography


