# FIFTH GENERATION DISTANCE EDUCATION

Professor Jim Taylor
Deputy Vice-Chancellor
(Global Learning Services)
The University of Southern Queensland
Toowoomba, Queensland, Australia 4350
E-mail: taylorj@usq.edu.au

## Introduction

Over the past twenty years, the transformation of a relatively simple computer network used by a few researchers into a global Internet, involving hundreds of millions of people and generating a new economic order, took government, business and education, by surprise. Given the well-established tendency for people to underestimate the extent and rate of technological change, it seems reasonable to suggest that the extent to which the Internet created economic and social upheaval in the past ten years is likely to pale into insignificance by comparison with the changes occurring in the next decade. The next few years will encompass the significant impact of broadband, wireless, smart cars, smart fridges, streaming media, voice recognition and the inevitable growth of new Internet applications. In the present context, change is the only constant!

How might institutions of higher education respond to such a dynamic external environment? The need for institutions to not only do things differently, but to do different things was encapsulated by Dolence and Norris (1995), who argued that to survive the transition from the Industrial to the Information Age organisations would need to change from rigid, formula driven entities to organisations that were "fast, flexible and fluid"- adjectives not typically used to describe the salient features of universities! Given the predilection of educational institutions in general, and universities in particular, to either wait and see and do nothing for the moment, or to add something new to an already overcrowded program of activities, it could well be that institutions of higher education could become a threatened species. This is a somewhat surprising consideration, since universities are overflowing with clever, innovative students and staff, yet as organizations, universities are often considered to be primarily moribund. The traditional inertia of long-established institutions is reflected in the well-known cliché, "Trying to change a university is like trying to move a graveyard – it is extremely complex, and you don't get much internal support!"

If the Internet is changing everything, will the Internet also have the power to change universities? Maybe, maybe not. Organizations don't change automatically. Organizational development requires proactive human intervention. It sometimes benefits from the implementation of explicit change management strategies.

As Katz and Oblinger (2000) highlighted when reviewing the potential impact of e-business on higher education, "The dominant issues facing the leaders of today's colleges and universities are what aspects to change and how fast can they be changed?" (p.xvi). Further, as Schlender (2000) recently pointed out, the Internet has already " …reached a stage that isn't so much about vision and proprietary innovation as about execution and competition " (p. 90). This emphasis on execution and competition is a particular challenge to the typically slowly evolving institutions of higher education, which need to find the means to "e-volve" rather more rapidly in the Internet Age. Indeed, many universities are still struggling to come to terms with the imminent challenges posed by competition for online students through the emergence of the global lifelong learning economy. Universities with a significant role in distance education, however, are different: they have always been, and will always be, in the vanguard of innovation and institutional change.

## Fifth Generation Distance Education

For many years, universities with a significant commitment to distance and open education institutions have been at the forefront of adopting new technologies to increase access to education and training opportunities. Distance education operations have evolved through the following four generations: first, the Correspondence Model based on print technology; second, the Multi-media Model based on print, audio and video technologies; third, the Telelearning Model, based on applications of telecommunications technologies to provide opportunities for synchronous communication; and fourth, the Flexible Learning Model based on online delivery via the Internet. Although many universities are just beginning to implement fourth generation distance education initiatives, the fifth generation is already emerging based on the further exploitation of new technologies. The fifth generation of distance education is essentially a derivation of the fourth generation, which aims to capitalize on the features of the Internet and the Web. To place the fifth generation Intelligent Flexible Learning Model into a meaningful conceptual framework, it is first worth reviewing briefly certain features of the previous four generations of distance education. Some of the characteristics of the various models of distance education that are relevant to the quality of teaching and learning (Taylor, 1995) are summarized in Table 1, along with an indicator of institutional variable costs (Taylor, Kemp and Burgess, 1993).

**Table 1 : Models of Distance Education - A Conceptual Framework**

| Models of Distance Education and Associated Delivery Technologies | Characteristics of Delivery Technologies | | | | | |
|---|---|---|---|---|---|---|
| | Flexibility | | | Highly Refined Materials | Advanced Interactive Delivery | Institutional Variable Costs Approaching Zero |
| | Time | Place | Pace | | | |
| **FIRST GENERATION - The Correspondence Model** | | | | | | |
| • Print | Yes | Yes | Yes | Yes | No | No |
| **SECOND GENERATION - The Multi-media Model** | | | | | | |
| • Print | Yes | Yes | Yes | Yes | No | No |
| • Audiotape | Yes | Yes | Yes | Yes | No | No |
| • Videotape | Yes | Yes | Yes | Yes | No | No |
| • Computer-based learning (eg CML/CAL/IMM) | Yes | Yes | Yes | Yes | Yes | No |
| • Interactive video (disk and tape) | Yes | Yes | Yes | Yes | Yes | No |
| **THIRD GENERATION - The Telelearning Model** | | | | | | |
| • Audioteleconferencing | No | No | No | No | Yes | No |
| • Videoconferencing | No | No | No | No | Yes | No |
| • Audiographic Communication | No | No | No | Yes | Yes | No |
| • Broadcast TV/Radio and Audioteleconferencing | No | No | No | Yes | Yes | No |
| **FOURTH GENERATION - The Flexible Learning Model** | | | | | | |
| • Interactive multimedia (IMM) online | Yes | Yes | Yes | Yes | Yes | Yes |
| • Internet-based access to WWW resources | Yes | Yes | Yes | Yes | Yes | Yes |
| • Computer mediated communication | Yes | Yes | Yes | Yes | Yes | **No** |
| **FIFTH GENERATION - The Intelligent Flexible Learning Model** | Yes | Yes | Yes | Yes | Yes | Yes |
| • Interactive multimedia (IMM) online | Yes | Yes | Yes | Yes | Yes | Yes |
| • Internet-based access to WWW resources | Yes | Yes | Yes | Yes | Yes | **Yes** |
| • Computer mediated communication, using automated response systems | Yes | Yes | Yes | Yes | Yes | **Yes** |
| • Campus portal access to institutional processes and resources | | | | | | |

Although a detailed cost analysis of various technology/pedagogy interfaces is beyond the scope of the present paper, it is worth noting that prior to the advent of online delivery, variable costs tended to increase or decrease directly (often linearly) with fluctuations in the volume of activity. For example, in second generation distance education delivery, the distribution of packages of self-instructional materials (printed study guides, audiotapes, videotapes, etc) is a variable cost, which varies in direct proportion to the number of students enrolled. In contrast, fifth generation distance education has the potential to decrease significantly the costs associated with providing access to institutional processes and online tuition. Through the development and implementation of: automated courseware production systems, automated pedagogical advice systems, and automated business systems, the fifth generation of distance education has the potential to deliver a quantum leap in economies of scale and associated cost-effectiveness. Further, effective implementation of fifth generation distance education technology is likely not only to transform distance education, but also to transform the experience of on campus students.

**The Emerging e-University: A Case Study**

Consistent with Schendler's (2000) proposed emphasis on execution and competition, the fifth generation model will not be presented solely as a set of abstract principles, but will be illustrated by an overview of the e-University Project, which has been planned thoroughly and is now in the early phases of implementation at the University of Southern Queensland (USQ). It is worth noting that USQ was the joint winner of the Good Universities Guides' Australian University of the Year 2000-2001 for criteria focused on developing the e-university. The Award, presented by the Prime Minister at Parliament House in Canberra, focused on the preparation of graduates of both undergraduate and postgraduate courses and the university as a whole for the emerging 'e-world', with the following specific areas considered.

*Area 1:* *Opportunities for students to access information and communications technologies.*

*Area 2:* *Tools for life as a student: the routine use of information and communications technology in administrative dealings with students.*

*Area 3:* *Tools for learning: using information and communications technologies in core educational processes.*

*Area 4:* *Opportunities for students to learn about information and communications technologies and their implications in the student's area(s) of specialisation.*

*Area 5:* *The introduction of courses/specialisations in aspects of the e-world*

*Area 6:* *Thinking through the use and implications of information and communications technologies in strategic planning and resource allocation.*

URL: http://www.usq.edu.au/Visitors/vc/vcGUG.htm

USQ's e-University Project was conceptualized in terms of three fundamental foci: the e-Information repositories, a variety of e-Applications and the e-Interface respectively. A graphic overview of USQ's e-University Project is presented in Figure 1.

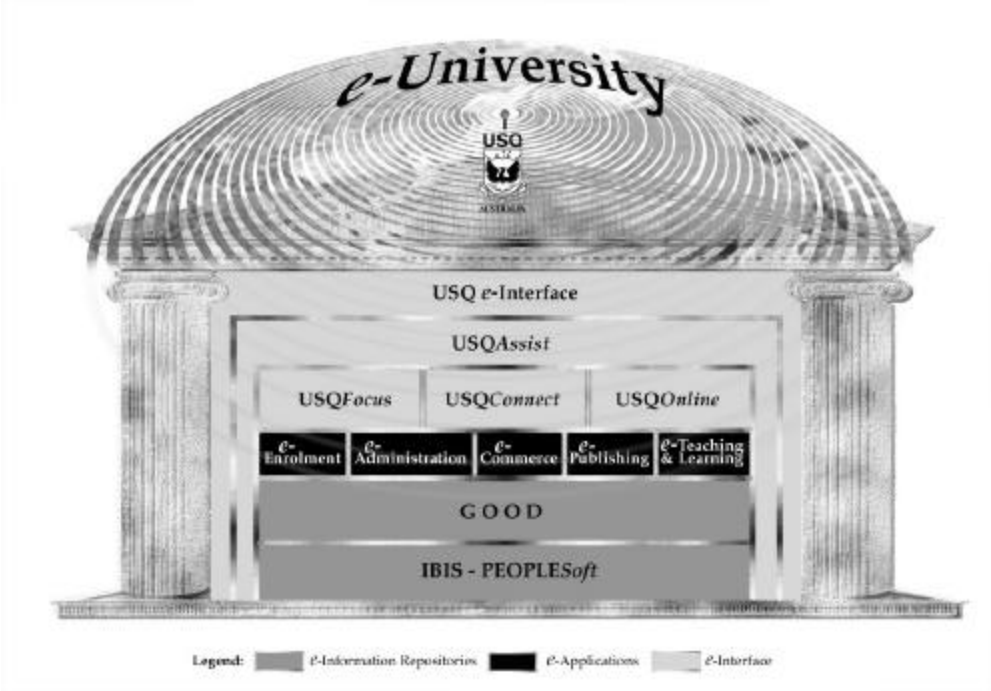


**Figure 1: Overview of USQ's e-University Project.**

In mid-1999, USQ selected the PeopleSoft enterprise software to update its existing business systems, which required major updating, both in scale and functionality. With a financial commitment of almost A$10 million and a project team of about 40 specialists, the University set about creating an Integrated Business Information System (IBIS) based on the PeopleSoft software. This initial commitment led to the implementation during 2000 of a new financial management system, including the following modules: General Ledger, Accounts Payable and Purchase Orders, and subsequently to the implementation of the Human Resources and Pay Roll modules. Student Administration, which is more complex, is scheduled to go live in early 2002. The relationship with PeopleSoft will ultimately lead to the implementation of PeopleSoft Version 8.0, which is totally web enabled and therefore entirely consistent with USQ's strategic commitment to the e-University Project.

Prior to the implementation of PeopleSoft 8.0, the existing system will provide an essential source of e-information in conjunction with the e-content management system at the heart of the Generic Online Offline Delivery (GOOD) Project, an application developed locally at USQ.

In essence, the e-content management system incorporated in the GOOD Project enables cross-media publishing from a single document source. This means that USQ is able to make courseware available to students in a variety of delivery modes (print, online, CD, DVD, etc.) from a single document source. At the core of the GOOD cross-media production system is a content management system, which provides an integrated document management, workflow and content editing environment. Further, the cross-media publishing process has been automated through the use of standard markup languages. The GOOD project has enabled USQ to replace its resource intensive proprietary production system for courseware with a single document source system based on the XML (eXtensible Markup Language) standard. XML-tagged courseware documents are structured within consistent, comprehensive parameters with the substantive content and structure able to be treated discretely from layout and presentation. The document layout is generated by applying XSLT (eXtensible Style Sheet Language:Transformations) to the XML-tagged content. XSLT is a language for transforming XML documents into their target formats (for example HTML for Web delivery). The GOOD cross-media production system uses XSLT to simplify and fully automate the task of publishing content in multiple formats. The GOOD "rendering engine" is capable of automatically converting XML content into PostScript and PDF for print delivery, and into HTML for web delivery. The GOOD system also enables academic content specialists to edit their XML documents, and to generate HTML, PDF and PostScript outputs on demand. While initially focusing on the cross-media production of courseware, in time, the GOOD system will be made available for numerous other applications across practically every section of the University, including the cross-media publication of the Handbook, Course Information, Admissions and Enrolment documentation and the like.

While the GOOD system provides a critical foundation for the efficient development and delivery of courseware, it will also provide an integral "engine" for the provision of a range of e-applications including e-Enrolment, e-Administration, e-Commerce, e-Publishing and not least e-Learning. While the scope of the present paper does not allow for detailed descriptions of all of these e-applications, a more elaborate view of the approach to e-Learning at USQ is warranted, since it has major implications for the use of technology to automate certain aspects of interaction with students, ultimately improving cost-effectiveness, reducing the cost to students and increasing access to higher education on a global scale.

**Automating e-Learning**

At USQ, the essential features of a fourth generation e-Learning environment support a learning process that is interactive, non-linear and collaborative. These features include the use of an interactive study chart as a basic navigational tool, which sets the broad parameters of the subject matter content to be investigated, and lists a number of exemplary references. References are electronic and hot linked via specific URLs. Additionally, the students are free to surf the Net for supplementary teaching-learning resources that meet their specific needs. They are also able to upload and download assignments, with those of sufficient quality being added to the teaching-learning resources database for reference by future students. The interaction with courseware materials is, however, only one element of the interactivity built into the USQ pedagogical approach. Interaction with other students, teaching staff and other experts, who act as mentors, is achieved through the use of Computer Mediated Communication (CMC), primarily through the deployment of asynchronous discussion groups. Students are encouraged, and in many cases required, to communicate through various electronic discussion groups, established for specific content areas as well as for informal social interaction.

Fundamental to online pedagogy is the effective use of asynchronous CMC for ensuring effective interactivity, which is generally regarded as an essential feature of effective pedagogy. It is worth noting that there is a qualitative difference between a traditional on-campus tutorial (real-time verbal communication) and computer conferencing (asynchronous written communication) with the reflective and precise nature of the latter being very different from the spontaneous and less structured nature of oral discourse in either a face-to-face, video or audio teleconference context. As Garrison (1997) highlighted, "The reflective and explicit nature of the written word is a disciplined and rigorous form of thinking and communicating ..... it allows time for reflection and, thereby, facilitates learners making connections amongst ideas and constructing coherent knowledge structures" (p.5). Computer conferencing is therefore not just another technology, its capacity to re-humanize distance education represents a qualitative shift which has the potential not only to reshape learning at a distance, but also to pervade conventional education systems. Further, and more importantly, in the context of fifth generation distance education technology, CMC provides a rich source of thoughtful interactions, which can be structured, tagged and stored in a database and subsequently exploited for tuition purposes on a recurring basis through the application of automated response systems. It is this judicious use of automated response systems, which has the potential to transform the cost-effectiveness of distance education and thereby to meet the growing demand for access to lifelong learning.

**e-Learning: From Cottage Industry to Mass Global Access**

The effective use of CMC is presently constrained in an important way. It is still a function of what Daniel (1999) recently referred to as the "cottage-industry model", which entails the traditional working practices of universities, wherein the same academic staff member usually does everything, including teaching, providing academic support and assessment for a group of students. In effect, the current applications of fourth generation Internet-based delivery tend to generate resource allocation models similar to tutorial-based on campus teaching. Indeed, it is still a fear of many academics initiating an online teaching program that they will be overwhelmed by email requesting support from individual students. While such fears can be allayed by the use of "one-to-many" communication systems such as bulletin boards, mailing lists and threaded discussions, the underlying resource model is not significantly different from conventional on campus teaching, with a staff member being necessary to manage groups of approximately 20 students to maintain a reasonable quality of interaction and academic support. In contrast, the fifth generation Intelligent Flexible Learning Model has the potential to deliver major economies of scale in managing teaching and academic support through the exploitation of automated response systems.

How does it work? In the USQ approach, many teaching staff make use of discussion groups, which entail students posting "reflections" via the asynchronous CMC system. The teaching staff also post comments, which are aimed at engendering student engagement and ensuring that the focus and depth of the online threaded discussions are appropriate to achieve the learning outcomes. In the same vein, members of the teaching staff respond to student questions posted to the discussion group. These contributions are often quite complex and typically serve to enhance the quality of interaction. Development of a detailed response to a searching student query naturally takes time. The benefit of the system is that the communication is on a "one-to-many" basis, so that all students may benefit, not just the one who asked the initial question. Further, our experience demonstrates that other students often comment on the issues raised thereby enriching the depth and quality of the dialogue. The value of these contributions is particularly useful where students are giving examples of applications in different cultural contexts. Such interactions may take place in conventional classroom settings, but the difference is that they are ephemeral and not documented for detailed reflection as they are in the CMC system. There is no doubt that many of the comments posted to the asynchronous discussion groups are valuable for tuition purposes. Storing such interactions in a relational database is technically straightforward, and provides a rich resource for mining by key word/matching, so that such pedagogical resources can be used to assist new students time and time again through the operation of the automated response system.

Our work at USQ has reached the point, where we have developed prototypes of what we refer to as intelligent object databases, which can be searched by pre-specified key words. Upon receipt of an electronic query from a student, the search engine seeks an appropriate match with a previously asked question, which if successful, triggers a personalized response to the current question without concurrent human intervention. At this stage of development, a tutor must check the validity of the match between the current question and the answers generated automatically from the database before forwarding to the students following a quick scan and with a single "click". Such a quality control mechanism may become redundant in the future. If no appropriate match is discovered in the database of previously answered questions, the query is automatically routed to the relevant tutor for an appropriate response, which is then added to the database with a single point and click. Depending on the pedagogical design of the course, these responses can be directed to the whole cohort of students, to groups of students, or to individuals. The system has the advantage of providing more-or-less immediate pedagogical advice to students, a significant increase in institutional responsiveness, at minimal variable cost. The use of automated response systems is also being integrated into e-Administration systems through the implementation of USQ*Assist*.

**e-Learner Relationship Management**

The USQ*Assist* initiative is deploying tracking and automation tools to manage the interaction between the University and both its existing and prospective students. As USQ already has a need to provide global learning services to students enrolled in more than 60 countries, the University has to face the challenge of being responsive to client needs 24 hours per day, 7 days per week. The most efficient, cost–effective way to manage the 24 x 7 challenge is to deploy effective automation tools, as opposed to running three shift student service desks or employing online tutors in different continents (although USQ already does the latter). The aim of such a system is to provide effective and efficient service to existing and prospective students at minimal variable cost.

When the project was initiated in late 1999, there were 13 toll free telephone numbers and numerous help desk facilities offered by various sections of the University. Each of these services provided a valuable service and collected some useful information, but there was no systematic recording and processing of enquiries that would enable USQ to be more responsive to satisfying student needs. The deployment of e-Customer Relationship Management (e-CRM) software (referred to by Milliron and Miles (2000) as "Learner Relationship Management" (p.60) also known as e-care or e-service) will ultimately enable the use of a single toll free number integrated with an email–based enquiry tracking system that will exploit the fundamental strengths of the Internet in enhancing communication and managing information.

Using structured, intelligent databases, the knowledge generated by solving student problems/enquiries is being progressively stored and made available so that, wherever possible, students with equivalent or similar problems can have their enquiries dealt with immediately through the self-help, automated response capacity of the USQ*Assist* system, thereby facilitating effective first point of contact resolution.

As the intelligent object databases become more comprehensive, enabling personalized, immediate responsiveness to an increasing number of student queries, the institutional variable costs for the provision of effective student support will tend towards zero. The effective use of such technology not only improves the responsiveness of the institution, but also frees up student support personnel to provide personal assistance via email dialogue or telephone as necessary. Further, every interaction is tracked from initiation to resolution, including flexible routing of enquiries based on explicit rules-based escalation protocols to ensure timely and successful responsiveness, and subsequent statistical reporting of system performance. Tracking interactions with prospective students enables the collation of the effectiveness of institutional marketing strategies, an increasingly important strategic issue for universities in the emerging global learning economy, which demands a highly effective public e–Interface with the University.

A central feature of the fifth generation model is the development of a customizable e-Interface, a campus portal through which students, staff and other stakeholders can engage with the university in a highly interactive and compelling manner. In Norris' (2000) terms, a well designed campus portal will engender "pervasive, perpetual interactivity "(p.6), which will enable universities to provide such efficient service to students that it is likely to build effective, enduring relationships that could last a lifetime. To be successful in the emerging global lifelong learning market, a university needs to create a campus portal that will achieve a degree of interactivity, user friendliness and personalization that does not exist in the vast majority of campus web sites today.

The final element in USQ's eUniversity project is the on campus wireless networking initiative. This part of the strategic plan emerged from concerns expressed by on campus students that they were becoming increasingly disadvantaged by lack of sufficient access to online resources and services, since the computing laboratories were devoted primarily to the teaching of specialized software applications, often requiring access to "high powered" hardware and software. USQ is now in the second phase of the project, wherein funding has been allocated to enable the installation of wireless hubs that will ensure access to the Internet from about 90% of on-campus locations. The initial successful wireless hub trial conducted in 2000 provided wireless access to the Internet from the Library, the Refectory and the Distance Education Centre. Students gained access to the Internet through laptop computers fitted with a wireless card, providing access at 11Mb using IEEE 802.11b wireless standards.

In the near future, wireless access will also be available through such devices as LG Electronics' Web Pad, Intel's Web Slate or Qubit's Web Tablet, which are soon to be released. This freedom to have access to the Internet from virtually anywhere on campus is a key feature of providing access to online courseware and services to all students whether on or off campus. The key to the success of such initiatives is, of course, detailed execution and associated, institution-wide organizational development strategies to enable the necessary institutional change.

**Organisational Development**

Apart from creating a new senior management portfolio, Vice-President (Global Learning Services) to provide institution-wide leadership of the e-University Project, USQ also allocated resources to create a small team of specialists to facilitate the integration of the aforementioned e-systems through the design and development of the e-Interface, the campus portal, which is being managed under the auspices of what is known locally as the Building for Enterprise and Teaching with Technology Enhanced Responsiveness (BETTER) Project.

The goal of the BETTER Project is the functional integration and interoperability of the constituent components of the e-University project, including Peoplesoft, GOOD, USQ*Assist*, USQ's existing Intranet systems (USQ*Connect* and USQ*Focus*) and the University's commercial initiative with NextEd Pty Ltd, USQ*Online*. This integration is to be achieved through the development of an e-Interface, entailing a complete re-conceptualization of the USQ web site. It is hoped that the benefits will be better service to students and more efficient workflows within the University. The public face of the University experienced through this campus portal will be a sophisticated e-Interface that will provide a gateway to all USQ's information and services that will respond in a personalised way to user profiles and individual needs.

The BETTER team was created by seconding the University Librarian to lead the project, with the support of her Executive Assistant, an e-Policy Development Officer (new part-time appointee, who works three days per week) and the e-Systems Designer, the key local expert, who formerly managed the USQ Distance Education Centre's Network Services. Although relatively few in number, this core team has extensive expertise and has considerable access to the various teams managing the constituent projects. Apart from the staffing budget for the BETTER team, the e-University Project has access to A$2.5 million over the 2001-2002 period from the University's capital development funds, which can be expended not only on bricks and mortar, but also on technology-clicks and mortar!

While the major focus of the BETTER team is the redesign of the USQ web site to enable a single gateway to the seamless integration of the underlying e-infrastructure and component projects, it is also the key focus for associated e-policy development, interoperability considerations, metadata and related standards' issues, as well as for the development and implementation of a communications strategy to keep all staff members up to date with developments. The pathway of the BETTER Project to the formal institutional decision making structure of the University, including the President's Consultative Committee and the Academic Board, is through the Information Infrastructure and Services Committee. The e-University Project is clearly central to USQ's strategic planning, with the associated commitment of human and financial resources to sustain the necessary proactive approach to change management aimed at facilitating institutional transformation on a corporate scale.

## Conclusion

In many universities the development of web-based initiatives is not systemic, but is often the result of random acts of innovation initiated by risk-taking individual academics. In contrast, the implementation of the e-University Project at USQ is strategically planned, systematically integrated and institutionally comprehensive. At USQ, the move to the online environment was a natural step for an institution with a history of almost 25 years of commitment to innovation in distance education. The increasingly central role of web-enabled information and communications technologies in USQ operations is supported by an organizational culture capable of sustaining innovation on a corporate, rather than individual, basis. USQ's institution-wide approach reflects one element of the corporate mission statement: *"To be a leader in flexible learning and the use of information and communications technologies".* Or, as the USQ President, Professor Peter Swannell, prefers to express it in public statements to the wider community, "The University's guiding philosophy is to give people: what they want, where they want it, when they want it. WWW is purely incidental!"

As a case study, the USQ experience exemplifies the institution–wide corporate approach necessary for an organization to become "fast, flexible and fluid" as it strives to develop the capacity to implement fifth generation distance education. The fifth generation (Intelligent Flexible Learning) model of distance education, incorporating the use of automated response systems and intelligent object databases in the context of Internet-based delivery, has the potential to provide students with a valuable, personalized pedagogical experience at noticeably lower cost than traditional approaches to distance education and conventional face-to-face education. Previous generations of distance education are essentially a function of resource allocation parameters based on the traditional cottage industry model, whereas the fifth generation based on automated response systems has the potential not only to improve economies of scale but also to improve the pedagogical quality and responsiveness of service to students.

If this can be achieved on a sufficiently large scale, then tuition costs can be significantly lowered, thereby engendering much greater access to higher education opportunities to many students throughout the world, who presently cannot afford to pay current prices. In effect, fifth generation distance education is not only less expensive, it also provides students with better quality tuition and more effective pedagogical and administrative support services. The fifth generation is likely to be irresistible to students, politicians and the business community alike – it is also inexorable.

**References**

Daniel, J (1999). "Distance learning in the era of networks: What are the key technologies?" Paper presented at the *Pan Commonwealth Forum on Open Learning*, Brunei, 1-5 March.

Dolence, MG & Norris, DM (1995). "Transforming Higher Education: A Vision for Learning in the 21st Century". Society for College and University Planning (SCUP), Ann Arbor, MI.

Garrison, R (1997). "Computer conferencing: The post-industrial age of distance education". *Open Learning*, 12, 2, 3-11.

Katz, RN & Oblinger, DG (Eds) (2000). *The "E" is for everything: e-Commerce, e-Business and e-Learning in the future of higher education*. San Francisco: Jossey-Bass.

Milliron, MD & Miles, CL (2000). "Education in a digital democracy: Leading the change for learning about, with, and beyond technology." *Educause Review*, November/December.

Norris, DM (2000). "E-Business and Higher Education Marketplaces". Strategic Initiatives, Inc.

Schlender, B (2000). "Their reign is over". *Fortune*, 142, 9, 89-90.

Taylor, JC (1995). 'Distance education technologies: The fourth generation'. *Australian Journal of Educational Technology*, 11, 2, 1-7.

Taylor, JC, Kemp, JE & Burgess, JV (1993*). Mixed-mode approaches to industry training: Staff attitudes and cost effectiveness.* Report produced for the Department of Employment, Education and Training's Evaluations and Investigations Program, Canberra.