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**Canadian Association for Distance Education
Association canadienne de l'éducation à distance**

Submitted by Anne Forster
Distance Learning Consultant and
Member, The Canadian Association
for Distance Education
Contract: PST-6801
31 March 1994



**The Potential of Australia and New
Zealand as Markets for the Canadian
Distance Education / Learning
Technologies Industry**

For: Louise Fortin, Director
The Asia Pacific South Trade Development Division of the
Department of Foreign Affairs and International Trade, Canada

Foreign Affairs and International Trade, Canada

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**The Potential of Australia and
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 Learning Technologies Industry**

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Report Submitted to
 Louise Fortin,
 Director: Asia Pacific South
 Trade Development Division
 March, 1994

**Submitted by the
 Canadian Association for Distance Education
 Association canadienne de l'éducation à distance**
 Report prepared by Anne Forster, Distance Learning Consultant
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The Open Learning Technology Corporation in Adelaide, South Australia, gathered much of the information available on Australia and New Zealand, while the Canadian information and additional information on Australia and New Zealand was collected by the prime consultant on behalf of CADE.

The Canadian Association for Distance Education was pleased to manage this project and the author thanks the Association for its support.

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Executive Summary

Background

The strengths of Canada's distance learning industry have evolved from the dual infrastructures developed for distance education and telecommunications. These have positioned Canada with the capacity to deliver innovative and flexible solutions to meet education and training needs. New models of teaching and learning are emerging to address the need for human resource development through the provision of lifelong learning opportunities. These new models are supported by the convergence of media and technologies for learning which enable effective education and training to be delivered as required to individuals and groups in institutions, community based learning centres, workplaces and homes.

Developments in electronically distributed media have created a new industry, the distance learning industry. The distance learning industry operates in both the public and private sectors, is knowledge based and develops technologies which enable learning through communication, conferencing, networks, curriculum development, curriculum production, administration, learning management, evaluation and resource management. The distance learning industry is described here, in this report, as having seven sectors which overlap and are interdependent:

- Hardware and equipment
- Enabling applications software
- Content and learning programs
- Telecommunications and electronic delivery systems
- Learning settings
- International education and training
- Industry specialists

The Objectives of the Study

The purpose of this report is to examine Australia and New Zealand as potential markets for the Canadian Distance Learning Industry. The first task was to describe the distance learning industry in terms of its products, services and suppliers. Secondly, to gather market information on Australia and on New

Zealand which would assist the Department of Foreign Affairs and International Trade in determining future activities in relation to this market. Thirdly, to identify Canadian companies active in the region, to describe their perspective of the value of this market and to learn from their experiences. Finally to recommend specific activities and follow up actions conducive to increasing trade. The area of potential suppliers in Canada has not been examined since the objective of this report is to assist suppliers in deciding whether Australia and New Zealand are attractive markets.

The study was conducted by examining available market information gathered in Australia and New Zealand and by interviews with individuals both in the region and with industry specialists in Canada. In addition, fourteen companies with current activities were interviewed. Six profiles of these companies are presented here.

Findings

The changing distance learning environment places more and more emphasis on electronically distributed networks for learning. The potential of the electronic highway to change the way in which we live, work, and learn has stimulated many innovative developments in the use of media and technologies for learning. This future learning environment is dependent on fully accessible broadband telecommunications services and on the capacity to design, develop and produce effective learning programs and learning management systems.

The findings of this research indicate that Australia and New Zealand, like Canada, are going through extensive modernisation of their telecommunications infrastructures enabling changes to be implemented in the delivery of flexible and distance learning. Australian education policy and micro economic reform, linked to a training agenda have resulted in the rapid development of national initiatives designed to stimulate the acceptance of distance learning technologies for education and training. New Zealand, while a much smaller market, is experiencing similar national reforms. In both countries these changes provide unmet demand for distance learning technologies, products and services in all sectors.

Both countries offer market opportunities in all seven sectors in the post-secondary education and training areas. Content and learning programs is a highly competitive and protected sector but provides excellent opportunities for joint venturing where trusting relationships can be developed. Australia and New Zealand, like Canada, have strong reasons to protect their cultural identities, especially in the education area, from the onslaught of English language materials and courseware coming from the United States. Companies who build into their programs, processes for local adaptation, will be more likely to succeed in finding buyers in this protective environment.

Canadian companies are succeeding in doing good business in Australia and New Zealand, despite the obvious barriers of distance, time differences and difficulties in obtaining market intelligence. Papadopoulos (1993) identified more Canadian companies operating in Australia, in spite of its relative market size, than in France or Japan. The reasons for this lie in the strong social and cultural ties between the countries which facilitate easy business relationships. The three countries share a Commonwealth heritage. Australia and New Zealand have stable, democratic political climates and well developed diverse cultures.

New multi media technologies, which will be developed in parallel with the implementation of broadband services on the global electronic highways, will demand strategic alliances for the development, acquisition and delivery of services. Countries like Australia, New Zealand and Canada have populations which are too small to absorb the costs associated with production of multi media in specialist areas of education and training. Joint productions for CD ROM and specialist courses like those which already occur in instructional television, would increase investment opportunities and facilitate access to global markets.

Canada already has strong alliances and partnerships in the region and these need to be developed and promoted.

Activities which would assist in raising the profile of Canada's distance learning industry in Australia and New Zealand include:

- the development of a database for market intelligence;
- assistance in identifying prospective distributors in the region;
- the development of joint, pre-competitive R&D projects like those developed between Canada and the European Union;
- a global market observatory;
- the development of the distance learning industry in Canada and
- the promotion of the industry at government levels.

Section 1 Overview

1.1 Introduction

The Canadian Association for Distance Education was engaged by Foreign Affairs and International Trade Canada (FAITC) to undertake market research on the Australian and New Zealand distance education sector. This engagement was conducted under the terms of a Short Form Services Contract #PST 6801.

The Statement of Work for this contract directed CADE to "...prepare a full and detailed market research on the Australian and New Zealand distance education sector focussing on identifying the potential for the state of the industries, the potential for joint research and development projects as well as investment and export sales opportunities for Canadian distance education companies and organizations. The market research shall recommend specific activities and follow-up actions which will be conducive to increase trade in distance education between Canada and Australia and New Zealand."

The workplan accepted by FAITC clarified that by the "distance education sector" FAITC is referring to the distance education and the distance learning technologies industry which serves both the private and public sectors for education and training purposes.

The delivery of education and training generally is now inter-dependent with distance learning technologies which enable teaching and learning. New models of teaching and learning embrace a spectrum which includes classroom based instruction, enhanced by electronic media and telecommunications, as well as the independent distance learner in an isolated community, who might well link with students in that same classroom for elements of a learning program. The distinctions between classroom based, or face to face instruction, and distance education are disappearing as telecommunication developments and new learning technologies open up the choices available for delivering

instruction and increase the opportunities for access by individuals at home, at work or in learning centres.

Distance education remains a distinct element within this spectrum. Its theory and practices serve to enhance the quality of decision making as more instructors seek to include technology based delivery solutions in their education and training provision.

Telecommunications systems, the regulatory framework and the development of standards are now critical components in the delivery of education and training using distance learning technologies. Thus, particular attention was paid to describing the telecommunications infrastructures of Australia and New Zealand.

In its efforts to identify markets for Canadian products, services, expertise and technologies FAITC has identified the Australian and New Zealand distance education sector as "sophisticated and well developed" however, by identifying market niches that match Canadian capabilities FAITC would be better able to assist Canadian companies in the formation of business relationships such as joint ventures or strategic alliances "that could lead to participation in third country markets as well as the creation of new products and technologies". (Covering letter to contract dated December 24, 1993).

1.1.1 Methodology

The gathering of the core market information for the Australian and New Zealand sections of this report was assisted by the Open Learning Technology Corporation Ltd, based in Adelaide, South Australia. The author supplemented this by phone, fax and electronic mail communication with over twenty individuals in government departments, private companies and educational institutions in Australia and New Zealand.

The lines of inquiry for this research also included a review of recent reports and publications on Australia, New Zealand and Canada. Phone and personal interviews were conducted with specialists, and with Canadian companies and distributors involved in this market. Additional print information was

generously provided by individuals and companies. Research activities focused on the following key questions:

1. What are the key features of the training and education sectors which are driving the development of the distance learning industry now and in the near future?

For each country, Australia and New Zealand:

2. What is the telecommunication infrastructure in each country?
3. Who are the biggest customers for distance learning technology products and services?
4. What are the main sources for funding the development of flexible and distance learning technologies in education and training? What are the size of these budgets?
5. What are the opportunities for products and services?
6. What are the top five markets for distance education and training products, distance learning technologies and services?
7. Who are some of the Canadian companies involved?

The frames of reference for this contract did not include a matching profile of the Canadian education and training systems. Although it would be useful to develop a market profile of Canada as a supplier.

1.1.2 Terminology used in the Distance Learning Sector

North America

In Canada, the terms most frequently used to describe segments of the distance learning sector include distance education, open learning, and technology based training. Canadian French terms include la télé-éducation, l'enseignement et/ou la formation à distance. Terminology in Canada reflects the separate developments of the different client sectors although some provinces such as BC, (the earliest Canadian adopter of the concept of open learning), and New Brunswick, (the most recent), which has the province wide TéléÉducation network, are successfully implementing projects with a high degree of collaboration among all sectors.

In the USA, distance learning, distributed training and business television are the most commonly used terms yet refer almost exclusively to synchronous interactive instruction (live, same time instruction). 'Distance education' is a term used mainly by those in formal education and the university sector.

Australia and New Zealand

In Australia, the terms "open learning" and "distance education" are most frequently used to describe this sector. Distance education being applied almost exclusively to activities in the public, formal education sector. Recently, 'Open and Distance Learning' was incorporated in a name change of the professional association, Open and Distance Learning Association of Australia, ODLAA, and is likely to become the key descriptive term used.

In New Zealand, the term, "correspondence education" is reserved for the K-12 sector, "open learning" and "telelearning" for the emerging activities in the post secondary and training sectors, and "distance education" for the higher education sector.

Europe

The term "flexible and distance learning" is used in the European Union program for research and development in Telematic Systems for Flexible and Distance Learning, (DELTA), whose aim is to accelerate the design and implementation of learning technology solutions across Europe. Van den Brande (1993) describes flexible and distance learning as having four key concepts¹ :

1. *Openness* in terms of meeting changing and differentiated learning needs.
2. *Flexibility* in terms of adaptation to individual needs and learning modes and providing full interactive facilities with tutors or other learners.
3. *Decentralisation* both in terms of reaching people in remote areas, and of unimpeded access to study facilities at a distance.
4. *Multimedia* training, a definition based on the prevalent instruments and techniques.

Flexible and distance learning combines these four key concepts. *Flexible learning is enabling learners to learn when they want (frequency, timing,*

¹ Van den Brande L., (1993) Flexible and Distance Learning, John Wiley and Sons, Toronto, 1993

duration), how they want (modes of learning), and what they want (that is, learners can define what constitutes learning to them). These flexible learning principles may be applied at a distance. If so then the term "distance learning" is used. In such cases the learners can choose where they want to learn (at home, at an institution or company, at a training centre, etc.)

Those wanting to promote the distance learning industry require terminology which does not exclude potential customers by targetting too narrowly. At the same time it is important to appreciate the differences of terminology used within sectors when niche marketing is required.

1.2 The Distance Learning Industry

The distance learning industry supplies products and services to meet the needs of learners at home, in the workplace and in institutions. The word 'distance' is used to identify that the learner is separated from the instructor for some or all of the learning program.

Distance learning technologies include those which have been developed to enable valuable interactions between learners, their instructors and their fellow learners. Some distance learning technologies seek to replace face to face interactions and instructor controlled media presentations, with combinations of audio, print, graphic, data and video interactions, which can take place in real time (synchronous) or in delayed time (asynchronous). Fully self-contained, media, such as some computer based training, seek to engage the learner by dialogue with a "built in" tutor. The process of engaging the learner in an active, "internalised conversation" is recognized as a powerful element of effective instructional design for distance learning.

The distance learning industry is undergoing dynamic change and growth influenced by the developments of advanced communication and learning technologies which have precipitated the convergence of a wide range of previously separate segments of the industry. This convergence has led to new models of teaching and learning which tend to reflect the outcome of different educational and training systems worldwide and differences in preferences for, and use of, technologies for learning.

The industry lacks a single identity

The distance learning industry is lacking a single identity in terms of what it produces. Changes in the structures of learning and developments in technologies are occurring at such a rapid pace that producers and customers need to develop shared terminology. Many technologies were initially designed for the Board Room. These are now wanted for use in school classrooms or to meet the needs of individual learners in homes and in workplaces.

Traditionally segmented market of education and training

The industry has previously been differentiated and in many cases, is still differentiated, on the basis of its market base in the two sectors: education and training. The education sector is divided between the schools, K-12, and post secondary (Universities and Colleges). The training sector comprises training in government, industry and commerce. This conventional differentiation of the industry on the basis of its customer base is becoming increasingly restrictive as new technologies alter the rigidity of these boundaries, changing the ways and places in which learning occurs.

The emergence of new technologies challenges the viability of this traditional segmentation and has also resulted in the convergence of previously separate media which are now integrated by computer. Collaborations and strategic alliances will be required to enable the appropriate skills and expertise to be brought together on the development of new applications, products and services.

Perhaps the biggest challenge is that the customer base is broadening to include not just big business, large enterprises and educational institutions but also individuals and groups learning and working at home, in learning centres and at work in small to medium sized businesses. There is a shift occurring from a fragmented, local distribution of training and education to more co-ordinated systems of community, regional, national and international networks. These systems link learners to education and training opportunities using telecommunications and local and wide area networks (LANs and WANs).

The convergence of training and performance

Developments in the distance learning industry are being accelerated by the emergence of the "electronic highway" and the restructuring of the telecommunications and information industries. At the same time, products and technologies which have applications in education and training, are also being used for carrying out work or performance related activities. Learning technologies are being used within the workplace as on-the job aids, or intelligent performance aids. Thus, even the separation between doing work and being trained for work, is diminishing as technologies enable individuals to train themselves while performing their jobs.

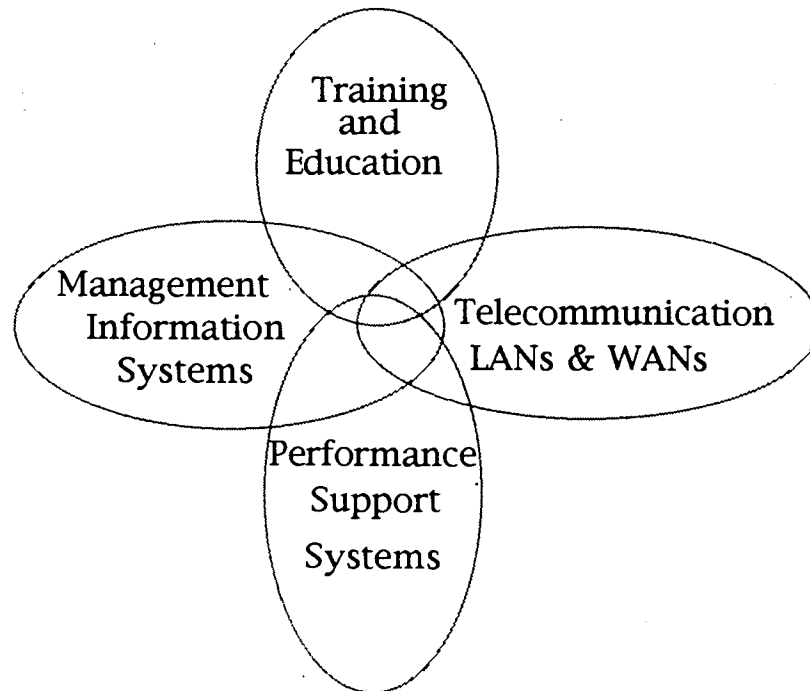
Towards a single identity

This report uses the term, Distance Learning Industry to capture the focus of the suppliers of products and services, from both the public and private sectors, to meet the needs of learners wherever they may be.

1.3 The Seven Sectors of the Distance Learning Industry

The Distance Learning Industry has proved difficult to define because it does not function as a discrete entity. Its technologies have many uses and applications. The diagram below shows the interdependence of technologies in a large enterprise where the interface for all these systems is the desktop computer:

Figure 1: The desktop computer interface with technologies in a large enterprise



In focussing on learning for education and training purposes this report seeks to identify concerns which have a knowledge base. The driving force of the distance learning industry is the production and distribution of knowledge.

This knowledge base can be integrated in technologies as actual course content, or as design features which enable interactions supporting learning. For example, a software package designed to simulate an electronic work bench or an electronic white board which enables graphics to occur simultaneously on similar boards linked electronically at several remote locations.

The identification of the seven sectors of the distance learning industry builds on earlier work by the Office of Technology Assessment (1991)¹ and Roberts & Associates/Associés (1993)².

The seven sectors are:

1. Hardware and equipment sector
2. Enabling applications software sector
3. Content and learning programs sector
4. Telecommunications and electronic delivery systems sector
5. Learning settings sector
6. International education and training sector
7. Industry specialists sector

1.3.1 Hardware and Equipment Sector

This sector supplies equipment for learning such as whiteboards and audio cassette players as well as more complex electronics equipment such as personal computers and liquid crystal display (LCD) screens.

1.3.2 Enabling Applications Software Sector

This sector supplies software tools and applications which enable learning. Applications such as wordprocessing, graphics and spreadsheets; conferencing software and learning management software.

1.3.3 Content and Learning Programs Sector

This sector supplies the learning program content. It covers the entire content of a program and also components of programs in areas as diverse as technical skills training and adult literacy.

¹ Office of Technology Assessment, "Worker Training" US Congress, Washington DC, 1991

² Roberts & Associates/Associés. The Impact of Information and Communications Technologies on Postsecondary Education, CERI/OECD Report, 1993.

1.3.4 Telecommunications and Electronic Delivery Systems Sector

This sector focuses on the systems and technologies which link individuals or groups of learners at home, in workplaces, in learning centres, in small and large enterprises and in learning institutions.

1.3.5 Learning Settings Sector

The settings in which learning takes place need to be designed to enable effective and healthy learning to occur. Ergonomic desks and chairs for individual home users and settings for interactive videoconferencing are some of the products and services of this sector.

1.3.6 International Education and Training Sector

This sector is concerned with bi-lateral and multi-lateral cooperation and collaboration in the design and development of education and training such as; the development of multimedia based courseware; international, full fee paying students enrolling in Canadian courses; or the selling of expertise in the development of distance learning systems elsewhere.

1.3.7 Industry Specialists Sector

This sector includes those concerned with developing the distance learning industry in general. They provide expertise and strategic advice to develop more effective practices and applications.

1.4 Products, Services and Suppliers of the Seven Sectors

This section provides examples of products, services and suppliers in each of the seven sectors to illustrate the diversity and to assist in conceptualising the distance learning industry.

1.4.1 Products

<u>Sector</u>	<u>Products (examples)</u>
1. Hardware and Equipment	PCs, whiteboards, televisions, VCRs, optical storage media.
2. Enabling Applications Software	Authoring, wordprocessing, graphics, conferencing, integration, management.
3. Content and Learning Program	Course manuals, instructional television, computer based training, CD ROM program audio-cassette programs.
4. Telecommunications and Electronic Delivery Systems	Voice and data services, satellite systems, switching systems, cable systems, bulletin board systems, information and communication networks.
5. Learning Settings	Ergonomically designed furniture, room design, screen interfaces, lighting, sound and visual design plans.
6. International Education and Training	Certificates, diplomas, degrees, training programs and materials, instructional systems.
7. Industry Specialists	Strategies, policies, reports, Implementation plans Project management guidelines.

1.4.2 Services

<u>Sector</u>	<u>Services (examples)</u>
1. Hardware and Equipment	Expertise and design in the development and production of, maintenance and training in the use of, hardware and equipment.
2. Enabling Applications Software	Software engineering, systems analysis, training in the use of, design and development of software.
3. Content and Learning Program	Student support, learning management, registration and administration, design and production, instructional design, media design and production.

4. Telecommunications and Electronic Delivery Systems	Planning and design of systems, collaboration to develop applications suitable for users, maintenance and technical assistance, training.
5. Learning Systems	Planning and development of designs, architectural designs, adaptation of space and surroundings.
6. International Education and Training	Student support, learning management, instruction, library resources, course information and registration.
7. Industry Specialists	Consultancy advice, research and evaluation, training, professional development.

1.4.3 Suppliers

<u>Sector</u>	<u>Suppliers (Examples)</u>
1. Hardware and Equipment	Manufacturers, resellers, distributors.
2. Enabling Applications Software	Software engineering firms, universities and colleges.
3. Content and Learning Program	Commercial trainers, colleges and institutions, television production groups, publishers.
4. Telecommunications and Electronic Delivery Systems	Cable and telephone companies, Television and radio broadcasters, network management companies, satellite space resellers.
5. Learning Systems	Architects, educational planners, training companies.
6. International Education and Training	Commercial trainers, colleges, and institutions.
7. Industry Specialists	Consultants, universities, colleges, schools, private companies.

1.5 An Analysis of the Market Potential of Australia and New Zealand

The findings of the research conducted in the development of this report indicate that Australia and New Zealand, like Canada, are going through extensive modernisation of their telecommunications infrastructures enabling changes to be implemented in the delivery of flexible and distance learning. Australian education policy and micro economic reform, linked to a training agenda have resulted in a rapid development of open learning initiatives. New Zealand, while a much smaller market, is experiencing similar national reforms. In both countries these changes provide unmet demand for distance learning technologies in all sectors.

Papadopoulos and Jansen(1993)¹, in a paper prepared for Industry Canada, commented on the surprisingly high number of Canadian companies operating in Australia and New Zealand. Using the application of a set of marketing measures, both countries rated as having only "moderate" appeal as target countries for export. However, in spite of the small size of its population and markets the number of Canadian companies operating in Australia was equal to or greater than the number of companies operating in countries like the United Kingdom, Japan and France which were all "hot" markets. The results of this study indicated that "objective" measures of market classification of countries do not always predict the entry by companies.

The study also showed that distributors play a more important role in relation to distant markets than to more familiar ones. The role of distributors in Australia and New Zealand for the companies interviewed for this report was critical in the comfort level of managers with these distant markets. Those who were dissatisfied tended to place the problem with the distributor. Those who were satisfied praised their distributor(s) and placed a great deal of confidence in their distributor(s)' ability to act independently and effectively on their behalf.

¹ Papadopoulos N., and Jansen D, (1993) Target Countries for Export. Summary of a report to ISTC, Distribution Services Industries Directorate.

The content and learning program sector is both a protected and a highly competitive sector, but provides excellent opportunities for joint venturing where good relationships can be developed. Australia and New Zealand, like Canada, have strong reasons to protect their cultural identities, especially in the education area, from the onslaught of English language materials and courseware coming from the United States. Companies who build into their courseware, processes to assist with local adaptation, will be more likely to succeed in finding buyers in a protective environment.

Canadian companies are succeeding in doing good business in Australia and New Zealand, despite the obvious barriers of distance, time zone differences and difficulties in obtaining market intelligence. The reasons for this lie in the strong social and cultural ties between the countries which facilitate easy business relationships. Australia and New Zealand have stable, democratic political climates and well developed diverse cultures. Both countries are good locations for regional headquarters or support centres for businesses wanting to operate in the region. Language, culture and schooling similarities have strong appeal for Canadian families facing relocation to the region.

New multi media technologies, which will be developed in parallel with the implementation of broadband services on the global electronic highways, will demand strategic alliances for the development, acquisition and delivery of services. Australia, New Zealand and Canada have populations which are too small to absorb the costs associated with production of multi media in specialist areas of education and training. Joint productions, like those which already occur in instructional television, would increase marketing opportunities and facilitate access to global markets.

1.6 Key Conclusions and Recommendations

Canada already has strong alliances and partnerships in the region and these need to be developed and promoted.

Activities which would assist in raising the profile of Canada's learning industry both at home and abroad in countries such as Australia and New Zealand include:

- the development of a database for market intelligence;
- assistance in identifying prospective distributors in the region;
- the development of joint, pre-competitive R&D projects like those developed by Canada and the European Union;
- a global market observatory;
- the development of the industry in Canada; and
- the promotion of the industry at inter-governmental levels.

Section 2. Australia

2.1 In brief.

Australia is the world's sixth largest country, covering an area of nearly 8 million square kilometres and almost as large as the United States of America, excluding Alaska. Measuring 4,000 kilometres from east to west and 3,200 kilometres from north to south, it is home to a population of some 17 million people. Approximately 70% of the population live in state capital cities or major cities on the southern and eastern coasts.

Australia has two dominant population centres: Sydney (3.7 million) and Melbourne (3.1 million), which together account for almost 40% of the total population. The next largest city is Brisbane (1.3 million). Over 20% of the population were born outside the country. About 1% are Aborigines and Torres Strait Islanders, the indigenous people of Australia.

Australia is a federation of six States and two Territories. The population of the states is shown below in descending order:

New South Wales:	6.0 million
Victoria:	4.5 million
Queensland:	3.0 million
Western Australia:	1.7 million
South Australia:	1.5 million
Tasmania:	0.5 million
Australian Capital Territory:	0.3 million
Northern Territory:	0.2 million

Australia has a Parliamentary democracy with a Federal (currently Labor) government (the Commonwealth Government). Australia is a relatively

affluent, industrialised nation (ranked in the top ten by the OECD), but much of its wealth derives from primary industry, particularly agriculture and mining.

The Commonwealth government has some responsibility for tertiary education and the national telecommunications infrastructure. Tertiary education, or post-school education comprises the university sector and the Technical and Further Education sector or TAFE (pronounced like safe). The States and Territories Governments have responsibility for the primary (K-6) and secondary (7-12) sectors.

2.2 DISTANCE LEARNING TELECOMMUNICATIONS INFRASTRUCTURE

Much of modern distance learning is dependent on telecommunications. This section provides an overview of Australia's regulatory and operational telecommunication infrastructure.

2.2.1 Voice/Data Services

By world standards Australia has a highly developed voice and data telecommunications infrastructure, providing near-universal service for voice telephony and a wide range of advanced services. More than 95% of all Australian households have a standard telephone service. The Rural and Remote Areas Program (RRAP) has provided automatic telephone services to around 44,500 customers in the most remote areas of the country.

Recent changes in the Australian telecommunication environment are intended to reduce costs and improve services through competition and to make Australia a strong player on the world scene. The Asia Pacific region is an area of significant growth opportunities, marked by enormous telecommunications activity.

With the Telecommunications Act (1991) Australia opened competition to the government owned domestic carrier, Telecom. Other elements of government policy include:

- The implementation of pro-competitive safeguards, including equal access and interconnection between the carriers;
- The introduction of unrestricted network competition starting in 1997;
- Full resale of domestic and international capacity;
- The issuing of three service operator licences for public, mobile telecommunications;
- Open competition in public access, cordless telecommunications services;
- A mandate for AUSTEL, the independent regulatory body, to promote competition;
- A requirement that *Telstra*, continue to provide a standard telephone service to all residential and business customers, with a price cap applied to its charges to ensure that the benefits of competition are shared equitably.

2.2.2 Technical Profile

- 5000 national and international telephone exchanges (3000 digital)
- Extensive voice-data cable network (more than 1 million km optical fibre, 60 % of population will have fibre within 600 metres of homes by end of 1994; analog)
- Australia-wide microwave radio network (digital and analog)
- Separate ISDN network
- Rapidly expanding cellular mobile network (more than 560,000 customers end June 1993, 27% annual increase)
- Large scale data processing and billing facilities
- Telephones in more than 95% of Australian homes.

A broad range of ISDN and digital facilities has been established. The optical fibre network program links all capital cities and there is a major upgrade of exchanges to digital switches.

Rural and Remote Radio Systems

To service rural and remote areas, Telecom has employed radio systems as well as cable. The Digital Radio Concentrator System (DRCS) is a solar power system designed by Telecom with a reach of 600 km from an automatic exchange and can connect up to 127 customers. High Capacity Digital Radio Concentrator Systems (HCRC) are being installed in high growth areas. These systems have a range of 2000 km from an automatic exchange and can connect up to 300 customers with a wide range of services including ISDN facilities.

2.2.3 Operational Profile

Three domestic carriers now operate under an interconnection agreement.

1. Telstra Corporation Limited, a full service carrier, was formerly the Australian and Overseas Telecommunications Corporation (AOTC), incorporating Telecom Australia (domestic trading name) and Telstra (international trading name). It provides domestic and international communications services (including satellite). It is wholly owned by the Australian Government.

Revenues in 1992/93 were A\$12,656 million.¹ Assets A\$23,160 million; 68,000 staff, Profit A\$2,356 million, adding A\$7.3 billion of value to the Australian economy, (2.1% of the GDP).

2. Optus Communications Pty Ltd, bought Australia's communications satellite system (AUSSAT) in 1992 and is the main competitor to *Telstra*, it provides long distance and mobile services only. It is privately owned (51% Australian, 24.5% Bell South Corp. and 24.5% Cable and Wireless).
3. Vodaphone Australia Ltd. (formerly Arena GSM), provides mobile services only.

¹ All \$ used in Section 2 are in Australian currency

2.2.4 Policy Environment

The independent regulator, is the Australian Telecommunications Authority (AUSTEL). AUSTEL promotes competition, and is responsible for consumer protection, standards setting and technical regulation. Connection of equipment on customer's premises requires a permit issued by AUSTEL. Evaluation of equipment against Australian standards is the responsibility of the equipment supplier.

Policy creation and implementation advice to the Government is the responsibility of the Federal Department of Communication and the Arts. The Department has a policy oversight role in relation to the government-owned telecommunications corporation.

International trade opportunities, including telecommunications services and equipment is the responsibility of AUSTRADE which is within the Commonwealth Department of Industry, Technology and Commerce.

Commercial Network Service Providers

Australian Associated Press (AAP) operates the largest commercial satellite network in Australia, with over 100 earth stations and provides a wide variety of services ranging from voice communications to financial services. AAP has recently combined with USA based M.C.I. Communications and N.Z. based Todd Investments to launch a range of "Virtual Private Networks" for voice and data services using Telstra and AUSSAT capacity.

2.2.5 Electronic Highway - Future Integration of Telecommunications Services

The Government's Broadband Services Expert Group, chaired by Brian Johns (Chair of the Australian Broadcasting Authority), is investigating how Australia should choose technologies for a nationally interactive information highway.

In February, 1994, *Telecom*, the government owned corporation, signed a memorandum of understanding with *Microsoft* to develop a new interactive

communications network to carry text, data, video and sound. Essentially, this pilot project using enhanced, existing voice / data lines, is a prelude to broadband development in order to attract public interest and investment.

In March, 1994, *Telecom* and Broken Hill Proprietary Ltd (BHP), which is Australia's largest conglomerate corporation, launched a A\$45 million, five year project, known as SiteLight. SiteLight will use synchronous digital hierarchy to link business premises with the optical fibre network. It will give users access to client serving computing, imaging, multimedia and advanced ATM networks.

Telecommuting is considered an important potential market enabled by the electronic highway. A recent (March, 1994), Australian Public Service Award, will assess applications for home-based work on a case by case basis. Once approved the Commonwealth will pay to set up a home workplace and supply items such as ergonomic chairs and laptop computers. An "Award" regulates terms and conditions of work.

An award is a legally binding document, recording the outcome of negotiations between a union and employer of the outcome of an arbitration process. Awards cover unionised and also non-unionised workers so they cover over 85% of workers in Australia and are very comprehensive in their impact on working conditions.

Union membership in Australia is high, though declining. Very large enterprises and the public sector have about 70% union membership.

2.2.6 Broadcast Services - Public

To date, most Australian homes have accessed only three commercial television channels and two government run television services (the ABC and SBS). Satellite services and access to cable TV using the optical fibre network will radically alter the services available to homes over the coming decade.

National radio and television broadcasting agencies include:

- National Transmission Agency (NTA)

- Australian Broadcasting Corporation (ABC) (broadcasts open learning programs during regular non-peak viewing times)
- International broadcasting service: Radio Australia
- The Special Broadcasting Service (SBS), a government owned corporation, is responsible for providing services to meet the needs of Australia's minority, multi-cultural populations. It broadcasts radio and television post-school services.
- commercial radio and television services
- public broadcasting services (no permanent services)
- Australian Broadcasting Authority (ABA)
- radio communications stations.

Narrowcast Satellite Transmission

Satellite delivered television services are distributed to specific geographic areas and offer specialised services such as those shown below:

- Sky Channel, New South Wales (clubs and hotels, some adult education)
- NewsVision, New South Wales (news)
- The Open Training and Education Network (OTEN), operated by the NSW Department of Technical and Further Education.
- Golden West, Western Australia (rural)
- Imparja Television, covers the sparsely populated Central Zone, including NT, SA, and Western NSW and Vic. (aboriginal owned and controlled)
- ABC/SBS, government run rural services focused on local communities and are dispersed throughout the country.
- Q-NET/TSN 11, QLD (educational)

Use of Broadcast TV for Distance Learning

Australia has only recently (1991) developed interactive television delivered, distance learning services. Using the national broadcasting services, ABC and SBS, fringe viewing times are now used for education and training purposes. The most significant recent development is Open Learning Australia, a brokerage agency, delivering university undergraduate degree courses from a consortium of universities. This is described more fully in section 2.6.2 Three other projects underway or in developmental stages in Australia are:

- Special Broadcasting Service/BHP and various Government departments. English at Work Series, delivering work place based training supported by printed materials.
- Special Broadcasting Service/Wollongong University
The Open University Project, delivering post-graduate degree courses from a network of universities.
- Australian Broadcasting Corporation/NSW Department of TAFE
Television Literacy Project, delivering adult basic literacy skills training supported by printed materials and toll-free telephone tutoring.

Pay TV

In March, 1994 Telecom announced that NEC¹ Australia will build the pilot phase of a project designed to deliver low-cost pay TV and video on demand down traditional copper wire phone lines using ADSL technology. The NEC bid includes US companies, Digital Equipment Corporation (DEC) and Compression Labs.

The pilot will involve 300 customers in Melbourne. ADSL will be complimentary to the broadband optical fibre/coaxial cable network *Telecom* would begin installing in high density housing areas this year. Broadband will cater for about one million customers in the inner city areas while ADSL will take the service to outlying suburbs. Digital Equipment Corporation has been confirmed as the provider of the video-server for the project.

Apart from the home entertainment value, *Telecom* expects that the service would allow schools and other educational institutions to tune into teaching programs for a fee. This facility could become a valuable distance education tool.

Business Market for Telecommunications

The total expenditure on telecommunications services in 1992/93 was \$10.5 billion. Recreation and community services have the highest per capita telecommunications expenditure of all sectors at \$1,840 million per annum. This is expected to decrease by 4.6% in 1994.

¹ Nippon Electric Company

Expenditure growth forecast for the business market in the early 1990s failed to eventuate, partly because of extreme competition between carriers, services and equipment suppliers and partly because of a critical re-assessment of their cost structures by users of telecommunications.

Communications managers are now looking to provide core business services at the lowest delivered costs available. This new emphasis on 'best value' has led to a prediction that total expenditure on telecommunications services will fall by 3.2% from \$10.8 billion in 1992/93 to \$10.5 billion in 1993/94.

2.3 Education And Training Policy

2.3.1 Background: 'The Clever Country'

A seminal work on Australian economic development in the late sixties was titled *Australia: The Lucky Country*. Author, Donald Horne, captured the essence of the success of Australia's primary industries in developing an affluent society. The changing world economy has forced Australia to broaden its training base. *When the Luck Runs Out* (Hilmer, 1985) described the problems facing Australian workplaces as they shifted to a recognition of the need for better management.

Modern competitive economics require not just better management. The key asset is a skilled workforce which can adapt quickly to major changes in the economic environment. Australians are now being asked to "think clever" and the term, "the clever country" is used widely in the government's policies to reform the Australian economy.

Education and training is an essential part of the Australian Government's micro-economic reform. The value of 'open learning' in particular derives from recognition of the need to establish a culture that values continuous learning and an educational system that provides those opportunities.

Concern for economic viability is matched by one of the social justice objectives of the Government related to the application of information technology:

"We need people capable of understanding, using and improving on these technologies. Equally, however, we need people who can identify the human problems associated with the introduction and application, and ensure that they work to our best advantage in both economic and social terms." (*Satech Consultancy 1 Report 1992, pp 1-7.*)

Recent initiatives demonstrate the Commonwealth Government's determination to change and improve education and training. After extensive research, the Australian Education Council announced in 1991 that the time was right to consider a national education framework that would benefit all sectors.

"The development of a national framework is now essential to support initiatives in curriculum collaboration and efforts at achieving more efficient and cost-effective course delivery, economies of scale and much improved utilisation of resources." (*Satech Consultancy 1 Report 1992, pp 1-7.*)

On 2 March, 1994, the Senate Standing Committee on Employment, Education and Training called for an inquiry into the present and future role of open learning in education and training; in particular for the purposes of enhancing participation in higher education and post-secondary vocational education and training.

2.3.2 National Education and Training Reform Agenda

New developments and key policy issues are encapsulated in the National Education and Training Reform Agenda embarked on by the Commonwealth government in 1991. The aim of the agenda is:

... to make Australian industry more competitive internationally by increasing workers ability to 'think clever'. This will require workers to be better trained to meet the demands of industry. The national drive for economic reform, coupled with substantial changes in the workplace brought about by award, industry and enterprise restructuring, is leading to the restructuring of Australia's training system . . . The aim of the new vocational education and training (VET) system is for existing workers skills to be better developed and improved and for school leavers to be better equipped for employment.

Along with wider microeconomic reforms, major reforms have been undertaken to education and training systems to increase their capacity, improve their responsiveness and upgrade the quality of services provided. The government established a National Training Board (NTB) and has encouraged:

- competency based training;
- unified entry-level training;
- credit for skills already acquired;
- greater convergence of general and vocational education;
- flexible pathways to accommodate the varying needs of industry and workers.

Key reports that have been completed include:

- Deveson report 1990—inquired into the costs of training arising from the restructuring of industry awards;
- Finn Report 1991—reviewed post-compulsory education and training arrangements;
- Carmichael Report 1992—proposed a new competency-based entry-level training system;
- Mayer Report 1992—explored employment-related key competencies;
- Rumsey Report 1992—recommended a model for vocational education and training credentials.

The Finn Report (1991) was particularly influential and led to the establishment of a new national education and training system in 1992, to be implemented in January 1994. This comprises a Ministerial Council, a new Australian National Training Authority (ANTA), and State training agencies to manage the delivery of vocational education and training.

The Finn Report's proposal for an Australian Vocational Certificate Training System (AVCTS) highlighted the need to develop a more appropriate regime of vocational education and training at the post-compulsory level and beyond with an integrated entry-level system.

As a result of the implementation of AVCTS, a new Australian Vocational Certificate (AVC), founded on a 'key competencies' concept, is expected to be introduced in January 1995.

The Mayer report identified the necessary key competencies for employment in the future as:

- collecting, analysing and organising information
- communicating ideas and information
- planning and organising activities
- working with others in teams
- using mathematical ideas and techniques
- solving problems
- using technology.

2.3.3 The Training Guarantee

The Training Guarantee was an obligation on employers to invest a minimum amount each year on training. The Training Guarantee Scheme was introduced in 1990 to increase employer investment in quality training, achieve a more equitable distribution of training across the workforce, and improve employer attitudes to training.

The TG required employers with an annual national payroll of \$200,000 or more to spend at least 1.5% on broadly defined, employment related, structured training. Employers spending less than the minimum had to submit the shortfall to the Australian Taxation Office. This would then be used to fund additional training.

There were few controls on quality of training. The scheme has created a climate where training needs are now more widely recognized. There have been many critics and the scheme has just been suspended (March 1994).

2.3.4 Distance Education and Open Learning

Distance education and open learning are two cornerstones of the National Training Reform Agenda and the Commonwealth Government's drive towards 'the clever country'. These services take education to the students rather than vice versa.

Distance Education

Distance education is provided in all sectors: students study through off-campus based correspondence courses using a variety of media, but predominantly print-based. Students may also use PC based electronic communications from home for mail and also for access to college library catalogues and request systems. Distance students are heavily dependent on external services, such as the postal system and the telephone, as well as local participating tertiary education institutions and local libraries.

Post-secondary distance education is provided by 24 universities, and nine TAFE institutions. Eight of the universities were designated national Distance Education Centres (DECs) in late 1989 and have since built on their strengths in quality instructional design and support services for students. However the DEC system was abandoned in late 1993 in view of the government's considerable interventions in open learning. There are six schools providing distance education for children from K-12.

Open Learning

'Open learning' is a concept that extends beyond the territory of traditional distance education and has recently been stimulated by a number of Commonwealth Government initiatives. Open learning in Australia defines educational provisions able to meet a variety of requests. For example, choice of content, choice of learning method/media, choice of a place for learning ' and choice of time to learn.

According to the National Board of Employment, Education and Training:

'Open learning' is not a precisely defined term in Australia nor abroad. It has been described as "An approach rather than a system or technique; it is based on the needs of individual learners, not the interests of the teacher or

the institution; it gives students as much control as possible over what and when and where and how they learn; it commonly uses the delivery methods of distance education and the facilities of educational technology; it changes the role of teacher from a source of knowledge to a manager of learning and a facilitator". (*Open Learning, National Board of Employment, Education and Training. Commissioned Report No. 4, June 1990,*

2.4 Funding for Education and Training

Higher education (university) is funded by the Commonwealth. The universities operate autonomously under State legislation.

2.4.1 Funding responsibilities

Technical and Further Education (TAFE) is a sector which provides post-school education. It receives State government funding for late secondary school programs delivered to adults and students who have left the school system. State governments also fund most of the vocational and training programs delivered by TAFE colleges such as hairdressing, auto mechanics, and electronics. The Commonwealth supplements State government funding and contributes equivalent university funding for TAFE courses accredited as degree and diploma level. It caters to adults who have left school but may require school courses up to matriculation level, technical and vocational education and some accredited degree and diploma level courses. The Commonwealth also provides 65% of capital works funding for TAFE.

The major responsibility for funding government schools rests with the State governments, which provide 90% of schools' running costs. The remaining 10% comes from the Commonwealth.

The Commonwealth Government also provides financial assistance to secondary and tertiary students in the form of regular allowances paid to students who are eligible (based on adult independent status or parents income). There are two schemes, AUSTUDY and ABSTUDY, the latter specifically for aboriginal students. University and some TAFE students contribute to education funding through the Higher Education Contribution Scheme (HECS) tax, which can be deferred until post-study employment.

2.4.2 Students and Expenditure

Table 2.1 describes the higher education, TAFE and schools market in terms of students and expenditure.

Table 2.1 Students and expenditure

Level/Sector	Students	Sites	Expenditure
University	0.535 million*	36	\$4,864 million (1994)
TAFE	1.600 million	N/A	\$1,570 million (1989)
All schools	3.100 million	10,000	\$9,838 million (1992)
Total Govt outlay			\$17,976 million (1990)
Private expenditure			\$3,748 million (1990)
Total govt and private			\$21,724 million (1990)
Industry funded training	N/A	N/A	\$1,470 million (1990)

* 1500 new places to be funded from 1994

The average funding rate for new undergraduate intakes in 1996 is expected to be \$10,000, which is consistent with funding rates for growth provided since 1989.

2.4.3 Training Expenditure

The Australian Bureau of Statistics is due to release statistics on training expenditure in June, 1994. A 1990 Training Expenditure Survey, conducted by the Commonwealth Government estimated that overall Australian employers spent the equivalent of 2.6% of gross wages and salaries on the formal training of their employees during a three month period in 1990. Average expenditure was \$163 per employee for 5.9 hours of training.

Private sector employers spent 2.2% and public sector employers spent 3.2%. Approximately 70 % of the training was conducted in house.

2.4.4 Personal Computers Expenditure

Figures provided here include 'goods sold to institutions and through institutions to students'; for example, through campus computer shops.

The retail value of PC shipments to Australia in 1993 was \$2,069 million. Table 2.2 details PC hardware and software expenditure in the Australian education sector.

Table 2.2 PC hardware and software expenditure

Item	Universities	TAFE	Schools
Number of students (millions)	0.54	1.6	3.1
Relative IT spending per student *	5	1	1
Share of IT expenditure	36%	22%	42%
Expenditure on sector (A\$ million)	46.5	27.8	53.9
Value of education software market (A\$million)	<u>3.9</u>	<u>2.3</u>	<u>4.5</u>
Total PC hardware & software in education	50.4	30.2	58.5
(A\$ million)			

* Expressed as a ratio; that is, for every \$5 spent on a higher education student, \$1 is spent on a TAFE student and \$1 on a school student.

Table 2.3 provides details of total PC market in Australia for 1993.

Table 2.3 1993 PC Market

Item	Number/value
Shipments in 1993	756,919
Annual growth	20%
Installed base	3.47 million
Annual growth in installed base	15%
Retail value of shipments	\$2,069 million

The number of PCs in Australian homes is estimated at 1,748,000. (Yearbook Australia, 1994, published by the Australian Bureau of Statistics).

Australia has a good reputation for acceptance of new technologies; for example, there is a penetration rate of 75% for VCR uptake in the nation's 6 million households, and 29% of households have a PC. Australia's per capita computer power is second only to that of the United States. The country has half the personal computing power of the United States and twice that of Japan, with 175 PCs per 1,000 people (compared to 265 in the United States and 84 in Japan).

Skillshare Centres

A national initiative, of the Commonwealth Employment Service, skillshare centres are community based training centres. 385 skillshare centres exist throughout the country and are equipped with computer mediated communications and other technologies for learning.

TeleCottages

TeleCottages, appear to have great potential for delivery of education services and to overcome some of the disadvantages suffered by people living in rural and remote areas in Australia. Facilities enable multiple user and cost sharing and are co-ordinated by a facilitator who trains users and supervises usage. The Centres also provide access to the Commonwealth Government information and access service, "Countrylink", which provides information and access to all Commonwealth departments and agencies. Services and programs such a education, health, taxation, social security, employment and training, business and farm management. citizenship, immigration and community development are all accessible via a toll free telephone, electronic communication and local facilitators. In 1992, the Commonwealth Government, Department of Primary Industries and Energy, allocated \$2.8 million for the establishment of telecottages to facilitate distance education over the next four years. Each centre has technologies available for users including computers, printer, modem, telephone, facsimile and various software applications.

2.4.5 Potential Growth

The total Commonwealth education expenditure for 1989–90 was approximately \$20 billion, which is 4.8% of the gross domestic product (GDP). (Canada spends 6.2 % of GDP)

Combined Commonwealth and State expenditure on schools (K-12) for 1991–92 was estimated to be \$9.84 billion. Twenty-three percent of this amount was operating expenditure and the remainder went to staff salaries or building infrastructure.

Private sector expenditure has not exceeded 0.4% of the GDP, but is expected to rise with growth of private sector contributions to higher education, including overseas students' fees, increased TAFE fees; and the stimulation of industry-funded training through initiatives of the National Education and Training Reform Agenda.

The Commonwealth Government funds approximately 11% of total recurrent and capital expenditures on government schools in the States and Territories (1992). TAFE gets Commonwealth Government funding for approximately 9% of recurrent costs and for some 66% of capital costs. Increases of 5% per annum have been suggested as a future requirement. In 1989 the Commonwealth Government spent \$1,570 million (recurrent) on TAFE training. Eighty percent of this (\$1,240 million) involved 'entry level' training. University education has a Commonwealth Government commitment of 3.3% growth per annum.

Industry-funded training expenditure in 1990 was approximately \$1,470 million. Fees for external providers represented \$470 million, with TAFE accounting for approximately 7% of the externally provided market.

Special Budgets for 1993

The report *Higher Education Funding for the 1994–96 Triennium* (DEET 1993)¹ lists key elements of the 1993 budget for higher education as including:

¹ DEET: Department of Employment, Education and Training

- \$56.3 million in 1995 and \$59.9 million from 1996 onwards to continue the Research Infrastructure Program beyond 1994;
- establishment of a deferred payment system for students using open learning;
- funding for the development of a decentralised network of access centres for open learning students;
- funding of \$12.9 million for 1,500 new student places in higher education.

Labour Market Predictions

The report, *Australia's Workforce in the year 2001*, (DEET 1993), predicts that by the year 2001, Australia's labour market will have undergone great change. The workforce will have become 'more clever' and low-skilled occupations will experience low growth. Industries where job growth is expected to be highest by 2001 include community services, health, building and construction, wholesale and retail trade, and public administration. The number of people in employment will rise from the 6.8 million recorded in 1986 to 9.25 million. Occupations with the best prospects are those of professionals, sales workers, and tradespeople.

According to the report, enrollments for higher education and TAFE will continue their growth of the past decade. This trend coincides with the massive loss of unskilled teenage jobs over the same period. DEET predicts TAFE enrolments will rise by 37%, up from 930,000 in 1993 to 1.33 million. Higher education enrolments should rise by 16% from 505,000 to 557,000. The report states that

"The growth in the number of people with degrees and technical qualifications is projected to be far above the growth in the workforce as a whole"

A better educated workforce will further improve the already considerable flexibility of the labour market to adapt to skill shortages.

The National Institute of Labor Studies predicts economic growth of 3.5% in the next few years, rising to 5% by the end of the decade.

A comprehensive and accurate description of the level of funding or expenditure for the training sector as a whole in terms of learning technologies does not exist at this time. Generally, this sector is highly fragmented; however, an indication of the range of training is provided in very general terms by recent reports published by the Australian National Training Authority (ANTA) and the National Training Board (NTB), as listed in the bibliography. ANTA is a funding body and the NTB is a policy advisory body.

2.5 Learning Technologies In Use

This section is intended to provide Canadian companies with some idea of the technologies currently operating in the Australian distance learning market. Information has been drawn from the Tkai (1993) *Technology Survey Report—Educational Technologies*, which provides an overview of the technology options available to those providing educational and training delivery and support. It excludes technologies in development; for example, optical disk, minidisk (MD), digital audio minidisk (DATAMD), digital audio broadcasting (DAB) or video on-call.

Currently available technologies identified in the report include:

- facsimile
- computer mediated communication (CMC):
 - electronic mail (E-mail)
 - bulletin board services (BBS)
 - computer conferencing
- audio:
 - audio-conferencing
 - radio
 - private automatic branch exchange (PABX)
- audiographic (using telephone lines to combine interactive graphics with voice)
- computer based learning (CBL):
 - computer based training (CBT)
 - multimedia/interactive multimedia
 - hypertext/hypermedia
 - performance support systems (PSS)
 - interactive book (IAB)
 - artificial intelligence (AI)

- virtual reality (VR)
- computer managed learning (CML)
- video-conferencing
- television:
 - broadcast TV
 - narrowcast satellite transmitted TV
 - high definition TV (HDTV)
 - pay TV
 - interactive TV.

Delivery media include:

- transmission media:
 - wired terrestrial i.e. cable (electrical signals) and optical fibre (lightwaves)
 - wireless terrestrial i.e. radio waves
 - satellite
- storage media:
 - optical media e.g. CD-ROM and interactive video-disk
 - magnetic media; for example, floppy disk, hard disk, tape and magneto-tape
 - optical disk.

Predominant technologies

Of the currently available technologies, those in predominant use, Tkal (1992) identified included e-mail, bulletin board systems, audio-conferencing, computer-managed learning, video-conferencing and television.

Electronic networks

Major Australian networks used in education and training

- Australian Academic Research Network (AARNet), a private network created by the universities and the Commonwealth Scientific and Industrial Research Organisation (CSIRO);
- Information and Libraries Access Network (ILANET), an electronic messaging service operated by the State Library of New South Wales and offering E-mail to 650 Australian libraries, and gateways to international services; for example, LANET (UK) and Internet;
- Telecom Nexus Information Service, a public facility, which offers local and Internet E-mail, full-text retrieval databases, and computer conferencing accessed by schools;
- Keylink, another Telecom e-mail, fax and telex service used moderately by schools.

- Pegasus Networks, a private network linked into the international Australian Environment Research Information Net (ERIN). Schools can form sub-networks within the system;
- CompuServe Pacific, an international on-line information and communications service available throughout Australia and New Zealand; and
- Fidonet a freenet used by schools and teachers, each node run by volunteer, provides access to AARNET.

Videoconferencing

As of March 1993, 20 of Australia's 35 publicly funded universities had videoconferencing facilities at 41 sites and over 20 sites were operational in the TAFE sector. 13 of the remaining universities had plans to install such facilities and the number of sites could increase to 80-100 over the next few years (Latchem, C. et al, 1993). Three types of codec are in use, Pictoretel (75%), CLI Rembrandt (20%), and GPT H120 (5%).

Videoconferencing in Australia was fueled by a A\$3.3 million grant for the establishment of facilities at 8 universities in 1990-1991. Costs per site for equipment are about A\$95,000.

2.6 Potential Customers

2.6.1 Overview

Australia is an expanding market for the learning industry. It is undergoing rapid modernisation. Recent initiatives in open learning have stimulated an uptake in the use of electronic delivery systems, audio and videoconferencing and new media in all sectors.

Major customers have emerged with the Government's Open Learning Initiative, including Open Learning Australia which is an independent company managing a national post-secondary program, supported by broadcast television

programs, electronic support and print based courses produced by a number of universities.

A key distributor of technologies and expertise to the education sectors will be the Open Learning Technology Corporation, which has been recently established by the State, Territory and Commonwealth Ministers of Education and Training. The OLTC is to facilitate and coordinate collaboration in the use of education technologies and open learning techniques.

Universities and TAFE Colleges have established extensive videoconferencing facilities, mainly used for business and administration purposes but rapidly being integrated into course delivery.

The TAFE sector has been through similar modernisation and the systems of the biggest states, Victoria (TAFE OFF-Campus Network), New South Wales (OTEN) and Queensland (OLN) have advanced electronic networks using audiographics and electronic conferencing to extensive networks of study centres.

Other major customers are the National Department of Defence, which is moving into distributed training and has just purchased a Canadian audiographics system, Departments of Health and Social Services, and State Government Departments of Health and Education.

Micro economic reform policies in Australia have been targeting industry to spend more money on training. There is a heightened awareness since the introduction of the Training Guarantee Levy but figures will not be available until June, 1994 describing expenditures on training by sector and type of delivery. The biggest companies in Australia are mainly conglomerates in the mining and industrial sectors such as BHP, CRA, AMCOR and BTR Nylex. The two biggest banking customers are the National Australia Bank and the Commonwealth Bank.

2.6.2 The Open Learning Initiative, A National Program

The Commonwealth Government budget of 1992/3 announced that up to \$47.3 million would be provided over the period 1993–1995 to support the Open Learning Initiative (OLI). The OLI was designed to increase flexibility and innovation and facilitate access to higher education by allowing completion of university degrees through study with the OLI.

The OLI has three components:

1. Open Learning Australia (OLA).
2. The Open Learning Electronic Support Service (OLESS) and
3. The Open Learning Technology Corporation (OLTC).

OLA is a company established by Monash University, Victoria, in conjunction with a consortium of universities. In 1994, 64 undergraduate university level units of study were offered. In 1993 there were almost 8,000 registered students undertaking studies in which courses can be completed through the following:

- print only subjects;
- print based subjects accompanied by television or radio programs broadcast by the Australian Broadcasting Corporation;
- computer assisted learning packages that support the printed materials.

The second component of OLI is the establishment of an open learning electronic support service (OLESS) to enable open learning students to take advantage of a communications system based on the use of personal computers and associated hardware and software. This service will allow students to communicate with university staff via E-mail and bulletin boards and to access library catalogues. Tenders are currently being considered for the implementation of this service.

The third component of OLI is the Open Learning Technology Corporation, (OLTC), which was established by Australia's Ministers of Education and Training to provide a coordinated national approach to the use of communications technology in open learning. OLTC is not a provider of

education or training; rather its role is to provide services that will assist the education and training community to achieve equitable provision of high-quality, cost-effective open learning.

2.6.3 New South Wales

Open Training and Education Network, New South Wales TAFE

OTEN has been established as a high technology education provider with State-wide (New South Wales) responsibility for the delivery of a core of distance and open learning programs; the development of innovative delivery techniques; the design, production and marketing of education and training materials; and the transfer of distance education expertise and open learning services and products to TAFE Institutes and school regions.

OTEN is the major distance education provider in Australia. It has the largest student enrolment with over 23,000 TAFE and 2,900 school students. OTEN has a total operating budget for the 1993-1994 financial year of \$45 million.

OTEN's Open Learning Program (OLP) delivers more than 120 accredited TAFE programs to students in all States of Australia and overseas. OLP maintains a strong student support system, including counsellors and disabilities consultants, to provide assistance for the wide variety of study needs of distance students.

OTEN's Education and Training Resource Centre (ETRC) develops and produces learning materials and other resources for distance students, the TAFE Commission, TAFE Institutes, and industry clients. ETRC produces both print and audiovisual materials including videotapes, slides and audio tapes. ETRC also produces and delivers programs, broadcast via satellite, to students enrolled at OTEN, in TAFE colleges and in secondary schools.

OTEN is also responsible for producing a daily half hour instructional television service broadcast using the public network, SBS. The Open High School component of OTEN provides for the educational needs of approximately 2,900 government and private secondary school students in New South Wales.

The Learning Materials Production Centre of OTEN is responsible for the design and development of distance education materials from kindergarten to Year 12. These materials are distributed to the Department of School Education's distance education centres throughout New South Wales and are also made available for purchase for face-to-face use in schools. Production of radio programs is also carried out for broadcast on SBS, Imparja, and over 80 community radio stations throughout Australia.

The Educational Technology and Communications (ET&C) section of OTEN evaluates and develops new technologies in education, including computer-assisted learning, multi-media, telecommunications and television broadcast technology. ET&C manages and supports the TAFE NSW on-line library catalogue and collection management, which serves TAFE libraries in New South Wales. It is responsible for the production and distribution of the CD-ROM catalogue, which is installed in over 90 libraries. This section also manages and supports the Open Learning Management System, which provides information about student progress, enrolments and the delivery of work units for OTEN students.

The OTEN Satellite Education Service operates a network of 95 colleges and geographically isolated schools.

University of New England: Master of Business Administration

The University of New England's 12-subject Master of Business Administration course is offered both on-campus and off-campus to full fee paying students. High quality print materials are supplemented by audiotapes and face-to-face weekend tutorials (two per subject) on the University of New England campus or in the Sydney or Brisbane centres. An alternative to these tutorials is the use of audio-conferencing. Enrolment includes students from many countries other than Australia.

Development costs for this program in 1993-94 were \$20,000 and recurrent costs were \$440,000.

UNINET

A fibre optic telecommunications network linking four of Sydney's metropolitan universities. Sydney, Macquarie, University of Technology and the University of NSW (serving approximately 80,000 students). Currently UNINET produces four broadcast quality television channels into and out of each university campus and access to the the broader ADTC network. It is used for such activities as weekly joint research seminars and postgraduate lectures and tutorials between universities which result in shared resources, reduced costs and increased access to special presentations.

University of New South Wales School of Pathology: Integrated High-Precision Microscopic /Macroscopic Digital/Video Teaching System

The University of New South Wales' School of Pathology makes extensive use of case histories and macroscopic and microscopic specimens in teaching. In 1992 technology was added that provided digitised macroscopic specimens, X-ray CAT scans and similar, along with conventional microscopic images through high-resolution video projectors. This has been accomplished by integrating a computer system into the video microscope set-up.

University of New England

The University of New England operates a number of joint venture arrangements with the public sector:

- *New South Wales Department of Corrective Services:* Establishment of the Centre for Professional Development—Corrective Services. Training modules are provided using print and audiotapes.
- *Telecom:* Tertiary education for middle management. Communication is via Telecom's Keylink Bulletin Board service, with most learning materials being print based.
- *New South Department of Health:* Establishment of the Centre for Professional Development in Health Sciences to provide staff development programs for people working in the health care industry. The course modules are completely external and consist of printed materials, audiovisual materials and computer-assisted learning case studies.

2.6.4 Queensland

Queensland Open Learning Network

The Queensland Open Learning Network provides individuals and organisations with access to education and training opportunities. The network consists of 37 Open Learning Centres throughout Queensland. The centre allows students throughout the State to participate in an extensive range of higher education, continuing education and other education and training programs.

Each centre is equipped with the following learning and communications technologies:

- IBM computer, CD-ROM player, printer and modem;
- Apple Macintosh computer, CD-ROM player, printer and modem;
- audio teleconferencing facilities, E-mail, fax and audiographic conferencing facilities.

Open Learning Institute, Queensland TAFE

The Open Learning Institute, which is based in Queensland, comprises the Centre for Strategic Leadership, the Vocational Education and Training Technologies (VEATT) centre, the Library Information Management Service and QDEC.

QDEC is the main distance education provider for approximately 15,000 students in the Queensland TAFE sector. There is a teaching staff of 55 and a support group of 80 engaged in the development, production and delivery of distance education courses. Funding for the development of CD-ROM materials for the 1993-94 financial year was \$258,000. In addition, \$160,000 was allocated for video-conferencing, \$30,000 for audio-conferencing, and approximately \$30,000 for upgrading of video production equipment. It is envisaged that there will be similar funds available for these activities during the coming financial year.

Major projects involving the adoption of new learning technologies in the near future include further staff training, the establishment of a telecommuting

network and the use of desktop video-conferencing. Staff training in the areas of CD-ROM and video-conferencing is an ongoing need for the Centre.

Queensland University of Technology: Computer Based Education

At Queensland University of Technology, computer-based education (CBE) has been implemented as a replacement for tutorial activities in large introductory classes rather than as a substitution for lectures and lecturers. Networked PCs based in learning laboratories in the University library are connected to a file server using Omninet networking hardware running a Novell network.

A typical lesson involves the asking and answering (with immediate feedback) of multiple choice or true/false questions, exploiting facilities such as onscreen graphics to question the learner. Students use the lessons in conjunction with texts in such subjects as physics, mathematics, chemistry, anatomy and physiology. Each year CBE provides approximately 185,000 hours of student time in more than 100 subjects and has involved 447 PCs in 14 laboratories on three campuses. In 1993, 15 800 students were users of CBE.

Hammersley Iron Pty Ltd and Karratha College (TAFE)

Karratha College offers a wide range of courses to Hammersley Iron on a contract basis, using computer-managed learning, video-conferencing and interactive videodisc. These courses are primarily at trade and certificate levels, although some courses at the supervisory level are being offered.

Examples Of Private Enterprise Training Initiatives

Two examples of a mixed mode delivery of distance education for industry training developed in partnership with the DEC of the University of Southern Queensland are:

- Queensland Fire Service—45,000 employees
- Woodside Offshore Petroleum—700 employees

The term 'mixed mode' describes the integration of face-to-face teaching with distance education methodologies based on the use of multimedia, self-instructional materials, printed study guides, audio tapes, videotapes and computer-based learning packages.

In the past ten years the University of Southern Queensland has also worked with the following organisations using this approach:

- Queensland Rail
- South East Queensland Electricity Board
- General Electric Company (UK)
- Sri Lanka Tyre Company
- Grainco.

Surveys have revealed that government departments, industry associations and trade unions are more enthusiastic about education in the workplace than private enterprise. Private companies are divided in their interest in having higher education delivered to the workplace and in their attitudes to playing a collaborative role. However, both public and private sector groups believe that prior learning in the form of work experience should be recognised as part of a higher education qualification.

As the result of the training initiatives undertaken by private enterprise with such institutions as the University of Southern Queensland, recognition of prior experience is now a key issue in vocational education and training (VET).

James Cook University of North Queensland: Remote Area Teacher Education Project

The Remote Area Teacher Education Project is a multi-media program, initiated in 1990 to upgrade the two-year qualification of community teachers in the remote regions of far northern Queensland and to prepare Aboriginal teachers on Cape York Peninsula. The program now accommodates 50 students in six centres. The project combines interactive computer programs that enable students to study in their own communities with Apple computers, a fax machine, teleconference phones and modems.

Development costs for the project for 1993-94 were \$15,000 and recurrent costs were \$130,000.

2.6.5 Victoria

Box Hill College of TAFE

Box Hill College, which is located in the Melbourne metropolitan area, provides vocational education and training to approximately 23,000 students. The funding for learning technologies during 1993 was \$380,000. It is expected that approximately \$400,000 will be spent in this area during 1994. The College plans to introduce PC-based video-conferencing in the near future and to continue to increase the use of computer-managed learning. In addition, provision of information and support to corporate clients in the flexible delivery of instruction is an increasing activity for the College.

Examples Of Collaborative Projects

Deakin University, Box Hill College of TAFE, Ford and Nissan

This collaborative project, which has been underwritten by the Victorian Education Foundation (VEF), provides course materials, delivery methodology, tests and student evaluation tools. There are three stages to the program:

- Foundation Studies Certificate of Applied Science (Technology Management);
- Associate Diploma of Applied Science (Technology Management);
- Bachelor of Applied Science (Technology Management).

Twenty-four hour access is provided to the students through:

- a computer-managed learning package, which delivers self-contained work modules;
- lap-top computers, which allow students anywhere in Australia to communicate with the software via the telecommunications network;
- self-paced flexible learning materials, which are essentially print-based but augmented by audio, video and similar media.
- E-mail, which permits students to contact tutors, deliver materials for assessment and other related activities.

In addition to these forms of access, tutors visit students at the industrial sites.

BHP and Monash University

The BHP–Monash University joint venture has resulted in a project to provide two graduate diploma courses, one in human resources management, the other in business studies. Monash University is providing the theory and overview and BHP the practical application and assignments.

The courses are modular and the order in which modules can be taken by the students is flexible. Delivery is at the workplace, using lectures and tutorials and distance learning materials including video.

2.6.6 Australian Universities and Colleges

The former Distance Education Centres are listed below, the remaining providers are listed in Table 1.1.

- Charles Sturt University;
- Deakin University;
- Monash University;
- University of New England–Armidale;
- University of New South Wales;
- University of South Australia;
- University of Southern Queensland;
- WADEC, a consortium of Western Australian universities—Curtin University of Technology, Edith Cowan and Murdoch.

Table 1.1 Other Distance Education And Open Learning Institutions

SECTOR

University

Australian Catholic University	University of Central Queensland
Flinders University of South Australia	University of Melbourne
Macquarie University	University of Newcastle
Northern Territory University	University of New South Wales
Queensland University of Technology	University of Queensland
Royal Melbourne Institute of Technology	University of Tasmania
Southern Cross University	University of Western Sydney
University of Adelaide	Wollongong University

TAFE

Adelaide College of TAFE	Rockhampton College of TAFE
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CB Alexander Agricultural College	TAFE External Studies College, Perth
Hobart Technical College	Victorian College of Agriculture and Horticulture
Open Training and Education Network (NSW)	Victorian TAFE Off-campus Network
Queensland Distance Education College	
<u>Schools</u>	
Brisbane School of Distance Education (Queensland)	Northern Territory Secondary Correspondence School
Distance Education Centre (Victoria)	Sydney Secondary Distance Education Centre (New South Wales)
Open Access College (South Australia)	Western Australian Correspondence Centre

Advisory Bodies

- Commonwealth Department of Employment Education & Training (DEET);
- National Board of Employment Education & Training (NBEET);
- Women's Employment, Education & Training Advisory Group;
- Aboriginal Employment, Education & Training Committee (responsible for implementing National Aboriginal & Torres Strait Islander Education Policy);
- Vocational Education Employment & Training Advisory Committee (VEETAC);
- National Training Board (NTB);
- Higher Education Council;
- Employment & Skills Formation Council;
- Australian Research Council;
- Register of Australian Tertiary Education;
- Australian Advisory Council on Languages & Multicultural Education;
- Australian Educational Council (AEC);
- TAFE National Centre for Research & Development Ltd;
- Curriculum Corporation.
- Australian Council for Educational Research (ACER);
- Standing Committee on Schools;

Section 3 New Zealand

3.1 In Brief

New Zealand covers an area of approximately one quarter of a million square kilometres and measures some 1,600 kilometres from north to south and 450 kilometres wide. The population at the 1991 census was just under 3.5 million people (Equivalent to the population of Sydney, Australia or Metro Toronto), with 2.5 million of these located in the North Island. The country is becoming increasingly urbanised and there is a migration trend from south to north.

It has a population density of 2.2 people per square kilometre (compared to the United States with 26.5, Canada 2.6, Australia 2.2 and the UK 233.8). The population is expected to grow slowly, and age steadily, to reach 3.8 million by 2001 and 4.5m by 2031. There are some 1.2 million households.

New Zealand is a parliamentary democracy currently with a conservative government (the National Party). The Government's involvement with education is dealt with by the Ministry of Education and the Education Review Office. The Ministry provides funding to all levels of education. NZ is a relatively affluent country with a gross domestic product per capita of \$(US)12,503 (compared to Canada with 16,019 and Australia 16,800), with much of its wealth coming from agriculture.

There are approximately 800,000 students in primary, secondary and tertiary education—95,000 in tertiary alone. Net government expenditure on education in 1990 was just over \$(NZ)4 billion. Technology uptake stood at 697 telephones per thousand people (and 94% of households) and 358 TVs per thousand in 1987. There is a PC in 13.3% of households.

3.2 Telecommunications Infrastructure

Telecommunications have helped New Zealand (NZ) overcome some of its isolation problems, and in recent years the trend towards deregulation in the communications sector has brought about major changes. In 1987 the former Post Office was split into three state-owned organisations—Post Bank, Telecom and New Zealand Post. New Zealand is now one of the least regulated countries in the world for telecommunications.

In 1990 the Telecom Corporation was purchased by a consortium of two United States and two New Zealand companies. CLEAR Communications Ltd was launched in 1990. It provides toll, private line and specialist local network services in competition with Telecom. Telecom operates an extensive telecommunications network, with 75% of its revenue coming from telephone services. The remaining 25% of revenue comes from leased circuits, telex, cellular and mobile radio, telepaging, packet switched services and a digital data network. Cable and satellite services are also available. This is an area of rapid growth and telecommunications has become an essential element for production and the national economy. Digital data has become a significant component of the traffic carried by the telephone networks in New Zealand.

Currently there are approximately 300 individual connections to ISDN in New Zealand which are increasing at the rate of 20 -30 per month. Projects to determine the cost effectiveness of ISDN are being conducted by the Open Polytechnic and the Correspondence School.

In broadcasting, there is a general trend towards FM transmission in the radio market. There are two TV stations; one public (NZBC) and one commercial. In addition pay TV has been one of the more commercially significant developments in NZ TV broadcasting. There is a VCR penetration rate over 70% into New Zealand households.

3.3 Education and Training Environment

3.3.1 Education and Training Policies

Since 1988 New Zealand has embarked on its most major reform of educational administration, (and consequent changes to its educational structures) since the establishment of the national system in 1877. The reforms are identified in a series of government policy documents, including:

- *Tomorrow's Schools* (1988)—dealing with the compulsory system;
- *Before Five* (1988)—dealing with early childhood education; and
- *Learning for Life: One and Two* (1989)—dealing with post-compulsory education and training.

The key common principles in the reform of all sectors include:

- charters—all education institutions to have an approved government charter;
- devolution—individual institutions undertake employer responsibilities and management;
- bulk-funding—based on formula allocation systems;
- review—institutions' performance to be reviewed against charters.

In early 1992, the New Zealand Government commissioned a report to explore how telecommunications technologies might be put to better use for the development of interactive learning systems in a wide variety of educational and training systems. A consortium, comprising a telecommunications consultancy group, a management consultancy company, and three education institutions won the contract and produced its report, the Consultel Report in August, 1992. Amongst other things the consultel Report recommended that the government support national initiatives in teleconferencing, television and computer communications. Prebble (1993) notes that since the release of the Consultel Report, developments in the application of technology to education have been very consistent with the predictions and recommendations of the report. In particular, the following initiatives based on collaboration between network organisations and educational providers, have stimulated an innovative climate in New Zealand for telecommunications based education and training.

- The New Zealand Tele Learning Network: shared conferencing facilities
- Educational Television: TVNZ and Auckland Institute of Technology
- New Zealand On-Line: educational e-mail system
- The World Communications Laboratory - promoting New Zealand as an international test site for new telecommunications options

The Consultel Report identified the need to build a 'learning culture' as critical to the success of the nation. The government has already recognised the need to link education and training with social and economic reform in the 'information age' and the commissioning of the Consultel Report was an attempt to bridge that link.

Another development is a new expectation that educators must create an environment in the education system that recognises and broadens the aspirations and achievements of women, and which addresses Maori issues, in particular Maori language education.

Public education has been restructured considerably over the last decade. At the school level, individual school boards of governors carry responsibility for the direction, resourcing and management of their schools. At the tertiary level, funding and policy distinctions between the various levels have been eliminated. The government is hoping to move away from being the sole purchaser of education services, and is coordinating the development of a network of Industrial Training Organisations (ITOs) which will be able to purchase educational services from wherever they wish.

3.3.2 Examples of Distance Learning - Activities in New Zealand

Current innovations in the use of telecommunications technologies for distance education, open learning and training needs to be placed in the context of recent developments in the structure of the NZ education system which, since 1988, has encouraged entrepreneurial competition among educational institutions in the new deregulated telecommunications market. As a result, some tertiary institutions are offering courses via 'telelearning' methods. Victoria University

in Wellington, Auckland University and Waikato University are currently targeting changing education needs not covered by established distance learning services such as the Correspondence School and the Open Polytechnic.

Another key interest is the provision of offshore education. Recent Polytechnic marketing has won \$1 million worth of exported education to Malaysia.

The New Zealand Tele-Learning Network (NZTLN)

The New Zealand Tele-Learning Network, a Telecom NZ initiative, has been established for use by all educational providers. Institutions can provide a network node or rent time on the network.

The NZTLN has three key components (Swift 1993) as follows:

1. A Network of Tele-Learning Centres

Each centre is equipped with audio, graphic, video and video conferencing equipment. Located in schools, colleges, universities, workplaces and homes. Centres can function as receiving, teaching and courseware development sites if properly equipped.

2. A Telecommunication Network

All Tele-Learning centres will be linked by bridging services for live audio, graphics and video and users can access electronic mail, the internet, library and database services.

3. A Network administrative Centre

A centralised reservation service to obtain access to remote Tele Learning centres. It will also maintain a register of courses, a file management system and manages the network. The Network can provide courseware and open learning packages, on demand from a central location.

New Zealand On-Line

A Telecom project to establish a national e-mail system for educational users.

The World Communications Laboratory

This is a project established by the government to promote New Zealand as an international test site for new telecommunications options. Jim Higgins is the Director of WCL. As the result of a conference held in March, 1993, the WCL and the Ministry of Education have agreed that a number of projects be initiated including:

- establishing national standards for the electronic delivery of educational products;
- putting together consortia to produce courseware using these media and then developing an institutional market for this courseware;
- cooperating in the application of broadband telecommunications to education;
- investigating the use of computer based training systems to supplement traditional classroom teaching methods;
- increasing the access of New Zealanders to education through a more thorough application of the principles of open learning.

The industry training strategy

This strategy was introduced in 1992. The policy components of the strategy include:

- Industry will specify training requirements through national standards bodies;
- Industry will fund training through industry training organisations and will contract out to providers;
- The apprenticeship system will be phased out;
- The National Qualifications Framework integrates different levels of post-secondary education.

3.4 Education And Training System

3.4.1 Statistics

New Zealand has 1,500 primary schools, 370 secondary schools, one correspondence school, and 38 tertiary institutions.

Primary	421,000
Secondary	230,000
Polytechnics	57,000
Colleges	6,000
Universities	86,500

Among these, some 35,000 Maori students are receiving secondary education.

Universities

There are seven universities in New Zealand:

- The University of Auckland
- The University of Waikato
- Massey University
- Victoria University of Wellington
- The University of Canterbury
- Lincoln University
- University of Otago.

The number of students enrolled in 1991 was 86,500, with nearly 10,000 degrees awarded in 1990. The bulk of studies are based in the humanities, with 31.5% of students; commerce with 26.6%; and science and technology with 23.6% of students.

In addition there are 25 polytechnics and six colleges of education. Further information on some of these institutions is given below. In addition, continuing education is a feature of this sector with all seven universities having centres for continuing education.

3.4.2 Agencies

The education sector underwent extensive reforms in 1988-9, when the Department of Education and regional Education Boards were abolished and replaced with eight agencies to administer education. These agencies are:

- Early Childhood Development Unit

- Special Education Service
- Quest Rapuara (a careers advisory service)
- Education Support and Training Agency
- Ministry of Education
- New Zealand Qualifications Agency
- Education Review Office
- Teacher Registration Board.

Other administrative bodies include:

- Boards of Trustees
- Polytechnic Councils
- Colleges of Education Councils
- University Councils
- Education Service Centres.

Other educational bodies are:

- New Zealand Council for Educational Research
- Maori Education Foundation

New Zealand has five main providers of distance education, all of which have well-developed delivery systems. These major providers, which are currently serving approximately 65,000 students, are:

- The New Zealand Correspondence School
- The Open Polytechnic of New Zealand
- Massey University
- The Advanced Studies for Teachers Unit, Palmerston North College of Education
- University Extension, Otago University

These providers of distance education rely primarily on printed materials, but these are being increasingly supplemented by other learning technologies including broadcast radio and television, audio and video cassettes, audio-conferencing, audiographic systems, video-conferencing, voice mail, E-mail and telephone (0800 service).

Some of the other initiatives being developed in the area of distance education are:

- Canterbury University (forestry)
- Waikato University (regional centres)
- Auckland University (satellite campus at Tamaki)
- Victoria University (tri-centre project in Communications Studies)
- Christchurch Polytechnic (radio)
- Auckland Institute of Technology (radio).

3.4.3 Funding Responsibility

Early childhood services are partially funded by the Government. The cost of teachers' salaries, school transport, major capital works and maintenance are paid for directly by the Ministry of Education. All other costs are funded by bulk grants to individual schools. A recent development in tertiary education funding is the new Equivalent Full Time Student system, which funds tertiary institutions in bulk according to the number of students and the courses that they are taking. Polytechnics, colleges of education and universities receive state subsidies for the number of equivalent full-time students in each of the course categories at their institution.

Net expenditure on education in 1990 was \$(NZ)4,044.8 million, or 5.8% of GDP. Net government expenditure amounted to \$(NZ)25,686.2 million, which represents 15.7% of net government expenditure.

3.5 Learning Technologies In Use

A number of technologies are applicable to education in NZ. The following are available at many institutions:

- fax
- E-mail
- BBS
- computer conferencing
- radio

- audiographic conferencing
- computer-based training (CBT)
- computer managed learning (CML)
- hypermedia
- CD-ROM
- CD-interactive
- Video-conferencing
- TV (pay/broadcast/satellite).

Despite this long list, the *Consultel Report* concluded that only two technologies can be used on a wide scale for education delivery to the home — television and telephone. The home computer market was considered too small at present (13.3%), and although over 6,500 computers are known to be installed in schools, it was estimated that less than 1% are capable of running modern graphic-based programs.

The key to deployment of technology for educational purposes is standards to ensure connectivity. The stringent economic conditions of the last few years and a critical shortage of skilled people in New Zealand have resulted in institutions focusing on the potential of information technology to realise future educational opportunities.

Schools Sharing Information Network (SSI Net)

Initiated by the Massey University Education Research and Development Centre (ERDC), this is a telecomputing network for staff development, staff training and school development. More than 65 institutions belong to the network which was operational in June, 1991 with IBM sponsorship. The network is now self-sufficient.

3.6 Potential Customers

3.6.1 Overview

The biggest customers in New Zealand for the learning industry are in the post-secondary formal education sector, particularly the Open Polytechnic of NZ, the k-12 schools sector and the individual users of the NZ TeleLearning Network as it picks up momentum. New Zealand is a small but rapidly modernizing market. After a decade of economic restructuring, the country is beginning to show real signs of recovery and there is a more positive economic climate. The opportunities for entrepreneurial activity have been greatly stimulated by government devolution of responsibility to institutions and to communities.

3.6.2 Major Initiatives in Distance Learning

The Open Polytechnic of New Zealand

The main distance education provider in the higher education sector is the Open Polytechnic of NZ (TOP), which provides 1,250 courses as part of 248 programs for post-secondary non-degree students throughout NZ. Over 36,000 students are enrolled, and over one-third of all polytechnic students study through Open Polytechnic. Most of the programs are at trade, technician and professional level, but proposals are presently under consideration for a Bachelor of Business.

Most of the courses at The Open Polytechnic of New Zealand (TOP) are print-based but during the financial year 1993-94, approximately \$250,000 was allocated for learning technologies. The same amount has been allocated for the current financial year (1994-95).

TOP is gradually changing its approach to distance education—the provision of inter-student contact and staff contact, and the development of interactive technologies is currently being undertaken.

New developments comprise the establishment of remotely located Resource Centres in Auckland and Wellington, which will be linked by telecommunications technologies to the main campus in Lower Hutt. Some of the technologies to be incorporated in the Resource Centre system are ISDN, video-conferencing, and audiographics.

Planned innovations are the use of QuickTime authoring software for the development of interactive multimedia, and CD-ROM development in collaboration with Telecom New Zealand.

Some of the difficulties encountered in the implementation of new and innovative technologies in the organisation are increasing staff awareness of the potential of new technologies and providing appropriate training.

The New Zealand Correspondence School

Distance education is provided for the school sector by the Correspondence School, which consists of a staff of approximately 550 providing instruction for over 300 courses to approximately 20,000 students. These include early childhood students, full and part time primary and secondary students, and adult part time students. Personal contact between students and schools is strengthened by teachers visits to isolated families. The school has a strong rural base.

The school is government-funded, with a budget of over \$30 million. It is the biggest provider of special and Maori education and the largest adult open learning service.

The principal medium for the delivery of instruction at the New Zealand Correspondence School has been print, but there are gradual moves to implement a video-conferencing system, audiographic systems and the development of a series of CD-ROM programs. Approximately \$50,000 has been spent during the financial year 1993-4 in upgrading computers used in the development of course materials, and it is expected that an additional \$20,000 will be spent on computers during the coming financial year.

There is a need to spend approximately \$250,000 to upgrade the telephone system used by the School, and negotiations are currently under way with the Ministry of Education for the development of a televideo system. Approximately \$400,000 has been allocated for this project.

Some of the main issues currently affecting the adoption and implementation of new learning technologies are:

- insufficient funds available
- the need for staff training.

Auckland Institute of Technology

Auckland Institute of Technology (AIT) is a large urban educational provider with 1200 staff spread among two main campuses and 7 satellite locations. About 23,000 full and part-time students are enrolled in 95 full-time and/or 220 part-time programs, including 1,500 degree students.

The implementation of learning technologies is being carried out as a result of the following projects:

- a 'point of information' system, which is an interactive database with graphics, is being installed at several booths on campus to provide information about AIT and its programs;
- the use of a computer aided design and drawing program for use in the Fashion Technology program.

Massey University

Currently Massey University is offering

- 17 degrees, 28 diplomas and six undergraduate certificates;
- 550 external units of study to over 16,000 students spread throughout New Zealand;

Massey University operates in a dual role in that teaching staff at the University offer their courses both internally to full-time students and externally mainly to part-time students.

Besides print, more than 30,000 audiocassettes are issued to students each year and there has been a gradual increase in the number of students engaged in

computer-based components of courses. A commitment has been made to establish a national E-mail system in the near future. Teleconferencing is used to a limited degree through the use of rented facilities from the University of Otago (UNITEL system) or Telecom.

Television is also used as a major distance education instructional medium with approximately 30 hours broadcast each year to external students.

The Advanced Studies for Teachers Unit (ASTU)

This Unit is a division of the Palmerston North College of Education. There are approximately 2,000 students enrolled in 60 distance education courses to retrain or upgrade teaching qualifications. Print is the main instructional medium, with limited use of other media.

University Extension, Otago University

Since 1981 Otago University has been involved in offering distance education courses using audio-conferencing or teleconferencing as the major communications medium. The two teleconferencing networks that have been established are UNITEL South, which links thirteen sites throughout Otago and Southland, and UNITEL New Zealand, which links twenty-six centres throughout the remainder of New Zealand. In addition, five sites have been established in Australia and one in Hong Kong.

UNITEL South is used in the provision of degree courses, primarily in the areas of humanities and social sciences, while UNITEL New Zealand is used in the provision of post-graduate courses in medicine, dentistry, pharmacy and other vocational courses in health related fields. Other selected courses are offered using teleconferencing in cities in Australia and Hong Kong.

UNITEL South operates through a system developed by the University in consultation with the New Zealand Post Office.

3.6.3 Examples Of Joint Initiatives

The following projects are combined Telecom and educational institutions initiatives:

- Beacon School—introduction of PCs, modems, fax and handsfree phones;
- Rural Schools Project—development of schools as telecommunity centres;
- AT&T Learning Network—E-mail networking with other schools;
- National Research and Educational Computing Network—linking 13 sites including research institutes, universities, the National Library and Government departments.
- Teacher Librarian Training—using voicemail;
- Schools Online Project—developed by the National Library.

3.6.4 Examples Of Private Enterprise Initiatives

The *Consultel Report* found that many in-house training initiatives were believed to be underway, but lack of co-ordination has resulted in little available documentation. Businesses known to be trialling new interactive multi-media technologies include aviation, security, energy and IT consulting. Telecom NZ is developing its ISDN network service to support these training applications. IBM is also introducing its Interactive Satellite Education Network (ISEN), for in house training.

The impact of the Industry Training Strategy is yet to be assessed. It focuses on initial qualifications rather than upskilling/ multiskilling those already on the job.

Section 4 Canada

4.0 Overview

Canada is regarded internationally as an advanced technological environment for learning. It is well regarded for its solutions in meeting the challenges of distance and in serving dispersed populations. Canada has an excellent reputation internationally but could lose this advantage to countries experiencing a stronger drive to modernize such as Japan and, the European Community.

There are several recent and comprehensive studies which have produced detailed information on Canada as a supplier for flexible and distance learning applications. These studies have focussed on particular sectors of the industry. Many of those interviewed for this report expressed concern that there was no comprehensive description of the industry and that one was needed if the industry was to thrive and obtain appropriate support. The description of the Distance Learning Industry, given in Section 1, was developed after discussions with those interviewed for this report and by building on a framework used by Roberts (1993). Those involved in the industry recognize its complexity and size and also predict strong growth. The characteristics of the Distance Learning Industry in Canada are that:

- It is a knowledge based industry;
- It operates in both the public and private sectors;
- Its technologies are converging and becoming interactive over networks;
- There are changes occurring in the models of teaching and learning now possible, creating virtual learning environments linking individuals and groups at home, at work, in institutions and in the community;
- New education and training practices rely on technologies which are common to all sectors of learners. These technologies enable communication, conferencing, networking, curriculum development and production, administration and learning management, evaluation and resource management. In addition,

- the Distance Learning Industry is involved in international education, such as the attraction of full fee paying students to Canadian education and training institutions. It has also developed
- industry specialists who operate as consultants, brokers and integrators, providing expertise, knowledge and strategic advice to assist those within the industry in developing better practices and in acting as informal and formal channels of distribution for the segments of the industry, or for the industry as a whole.

Thus, in Section 1, the Distance Learning Industry was described as having products, services and suppliers in seven sectors. The following list of those sectors provides examples of the kinds of Canadian companies active in the various sectors, many of which operate in more than one sector but are shown here only in one:

Examples of Canadian companies in the Learning Industry.

1. Hardware and Equipment Sector

- Smart Technologies Inc.
- Telesat
- Newbridge
- Adcom Electronics/PictureTel

2. Enabling Applications Software Sector

- Chancery Software Ltd
- WorldLinx
- TCC Communications Corporation
- Axia, Alberta

3. Content and Learning Programs Sector

- Alberta Distance Learning Centre
- Open Learning Agency, BC
- Compris Inc. ON
- FirstClass Systems

4. Telecommunications and Electronic Delivery Systems Sector

- Electronic Village
- Stentor
- Northern Telecom
- Softwords Research International Ltd

5. Learning Settings Sector

- Pathfinder Learning Systems Corporation

6. International Education and Training Sector

- Canadian Universities and Colleges
- Private Training Institutes
- Provincial Ministries of Education, Training and Development
- Canadian International Development Agency

7. Industry Specialists Sector

- Téléuniversité
- Info JED Inc. Q
- Delta Centre for Learning Technologies
- Anna Stahmer

4.1 Areas of Strength

Canada has a diverse and sophisticated Distance Learning Industry with strengths in every sector. These strengths have been developed through its strong provincial and community networks for learning and include:

- quality of instructional design developed over many years in universities dedicated to distance education such as the TéléUniversité, Athabasca and the Open Learning Agency;
- the use of instructional television provided by provincial networks;
- the most phone and cable connections in the world;
- a high penetration of digital fibre networks and ready access to satellite and cellular services;
- innovative solutions to the challenge of distance such as the Telemedicine Project in Newfoundland, Television Northern Canada, Wahsa Distance Learning and provincial education networks like SCAN, the OLA and Access Alberta.
- Canadians are used to working in two languages, they know the problems of culture and language adaptation.

Industry Canada, within Phase II of a Commercial Education and Training Services Sector campaign, documented the capabilities of suppliers of these services and sponsored five independent reports, including one focussed on technology based training. *Suppliers of Technology-Based Workplace Training: Challenges and Opportunities* by Anna Stahmer assesses the state of the sector based on extensive interviews with over 40 companies, with government representatives and with international experts. Stahmer found that while only

about 3% of corporate training budgets are now allocated to TBT in Canada, this proportion is expected to grow quickly. The federal government expects training expenditures to double over the next three years and that the potential share of this market for technology based training suppliers will be about \$150 million annually. Export sales are estimated to be ten times domestic sales.

Canadian companies report that there are difficulties in developing the distance learning industry in Canada because of the lack of coherence in Canada's education and training systems. Most companies operate comfortably in their own region and in other world markets. Perhaps the size of the markets in other provinces relative to the size of off-shore markets is not attractive enough to adapt products and services.

This national fragmentation is widely recognized and is being addressed by the development of national and provincial bodies seeking to bring together the main players. For example, the following associations and networks, both federal and provincial have been formed within the last few years:

- The National TeleLearning Research Network
- The Educational Network Coalition
- SchoolNet
- Conseil de l'industrie du logiciel éducatif et de formation du Québec (CILEF)
- Telecommunications Research Institute of Ontario (TRIO)
- Canadian Network for the Advancement of Research Industry and Education (CANARIE)

There is a vacuum in the development of a national policy and a lack of management in the setting of standards for technologies and performance in the learning industry. Researchers (Stahmer et al, 1992, Roberts, 1993, Conference Board of Canada, 1993) have reported on the under utilization of new technologies in Canada due partly to the need to upgrade the skills of trainers and teachers and also to the need for changes in the structural arrangements in place in workplaces and in institutions for the delivery of training and education.

If Canada's strength in the international market is its reputation and the perception that Canada has an advanced technology infrastructure which is well

used, then steps need to be taken to protect that image by building the Distance Learning Industry as a whole.

4.2 Current Involvement in Australia and New Zealand

During the development of this report twenty - seven interviews were conducted with industry specialists and company representatives in Canada. In addition four distributors in Australia contributed their perspectives. The findings of those interviews are presented here.

Twelve companies were identified with current activities in Australia and/or New Zealand:

- Chancery Software Ltd.
- Educational Technology and Consulting
- FirstClass Systems
- Interactive Image Technologies Ltd.
- Open Learning Agency
- Pathfinder Learning Systems
- Northern Telecom
- SMART Technologies Inc.
- Softwords Research International Ltd.
- TVOntario
- Waterloo Maple Software
- WorldLinx

An additional two companies were interviewed because of their interest in Australia and New Zealand:

- Autoskill
- New Brunswick Training Inc.

4.2.1 The Appeal of Australia and New Zealand

Interviewees were asked why they were attracted to Australia and New Zealand. Responses were consistent around the following characteristics of the markets:

There is a natural attraction, since Canada shares strong historical, social and cultural heritage links with Australia and New Zealand. All are young countries, English speaking, have similar political and educational systems, and there are similarities in the development of distance education and use of technologies. Australia and Canada in particular are both large countries with concentrations of urban dwellers in a few cities and dispersed small rural and remote communities.

Other comments included:

Australians and Kiwis like us. It is easy to work there.

It is a big market, going through expansion and modernization. Australia wants to be a force in the Asia Pacific region. It aims to have a very high quality intelligent network in place, driven by similar activities in Singapore and Hong Kong.

There is a demand for training and a need for English language programs.

The pace of change is quickening there as they are becoming more globally competitive than Canada.

4.2.2 Difficulties in operating "down under"

The most common barriers: distance, time difference, expensive air fares, market information hard to get.

The time difference creates a short working week. Australians begin their Monday morning on Canada's Sunday evening. The work week is over at 2am (EST) on Friday morning. So there are very few overlapping business hours. To work with Australia and New Zealand requires working nights in Canada, including Sunday. Asynchronous communication using email and faxes is the best solution.

The travel time is demanding - eighteen hours flying time from the West coast of Canada. The International Date Line means you lose a day on the way and can arrive back almost before you left Australia. The need for additional time to recover from jet lag at either end of the journey makes the possible travel time even longer.

Very little current affairs information filters through from Australia and New Zealand. It is difficult to keep abreast of political developments and economic analysis.

Several interviewees commented that Australians, perhaps more than New Zealanders, want to develop their own solutions, they prefer Australian produced curriculum materials. Some areas, such as the NSW and Victorian education departments, are very bureaucratic, and hard to do business with. New Zealand was considered a more open market by these interviewees.

There are language and cultural differences despite the seeming similarities. For example, Australia and New Zealanders both follow British spelling. Climatic and seasonal differences are significant. Summer vacations are held in December and January. Flora and fauna examples need to be locally relevant, particularly for K-12 educational media. Sports, clothing, leisure pursuits and brand names all reflect significant differences to those followed in North America.

Materials still need to be adapted to be acceptable. It is expensive to get market research information.

4.2.3 Channels of distribution

Most Canadian companies use a distributor, although most companies would prefer to form alliances and partnerships. In this industry there is often a long selling cycle. Distributors need to be very dedicated and know the product and its applications well in order to remain motivated and aggressive.

Good distributors need to be self motivated and independent. They are so far away, you need to have a good, trusting relationship.

4.3 Selected Profiles of Companies Active in Australia and New Zealand

4.3.1 Pathfinder Learning Systems Corporation

Contact: Harry Seymour, President

1001 Columbia Street

New Westminster, BC

604.521 1664

Profile: Began in 1989 as a non-profit Federal government organization. Bought by employees in 1992. Originally Pathfinder targetted out-of-work / out-of-school clients, now focusing on schools and independent learning centres.

Products: The Pathfinder Learning System and its francophone equivalent. Learning management software designed to reference other media and curriculum materials in a library. The system can be supplied with a library of over 1,500 materials including print, workbooks, audio and video cassettes, educational software, kits, CD-ROMS and activity binders. The teacher receives complete lesson plans, test generation and scoring plans. The teacher selects and develops test banks and individual learning paths directing students to library resources. The system accommodates 5-6 learners per terminal. The system is run off a file server/LAN.

International activity: The company is active in the USA and has clients in New Zealand and, more recently, in Australia. Their client in New Zealand is the Open Polytechnic and in Australia, the Torrens Valley Institute of Vocational Education. In both cases Pathfinder were invited on the basis of recommendation. They do not use a distributor.

Issues: The system is supported by training sessions which the customer pays for. The most important issue is the local adaptation of the library to meet local curriculum needs and cultural relevance.

In order to expand they want a more thorough understanding of the educational infrastructure and of the sources of funding. They also think they need to become more familiar with local Australian/New Zealand resources and include them in their products. They found that the New South Wales education Department would not accept any but locally developed curriculum.

4.3.2 SMART Technologies Inc.

Contact: Nancy Knowlton, Vice President/Co-founder
or David Martin, President/co-founder
#699, 240 11th Ave.,
SW Calgary, AB. T2R 0C3
403 233 9333 Fax: 262 3524

Profile: Founded in 1987, SMART Technologies provides integration of computer and telecommunications to enhance meeting and training effectiveness. The company has 40 employees and sales offices in Canada and the US. It has projected sales of \$8m in 1994. Recently it formed a partnership with INTEL Corp to jointly develop data conferencing products. A major Canadian customer is the New Brunswick TeleEducation Network.

Products: SMART 2000 Conferencing System: Windows based conferencing software and touch sensitive electronic whiteboard (SMART WhiteBoards).
Software tools.

International activity: Smart Technologies Inc. conducts 95% of business outside Canada. USA (45-50%), Japan (25-30%), Australia (5-7%), England (5-7%), Canada (5%).

The company began working in Australia through strong personal ties with a distributor (ElectroBoard, Sydney and Brisbane). They have always found it easy to work there and have benefitted from the major thrust in distance learning occurring there. They have just sold their system to the Australian Department of Defence.

Issues: Despite having a good distributor, publicity and PR are still up to the company itself and the distance makes running a campaign difficult. Nancy Knowlton will be going to Australia for promotional purposes in mid 1994.

The company would appreciate FAITC help in actively promoting Canadian products in general and in helping to distribute press releases for Canadian companies in foreign countries. They also need direct contacts, names of organisations and full contact details. For example FAITC should buy a database of MIS directors in Australian and New Zealand companies.

4.3.3 FirstClass Systems Corporation

Contact: Ken Tongue, President and Ken Harrap, VP, Marketing
200-1456 Johnston Road, White Rock, BC, V4B 3Z5
604 538 7246 Fax: 2896

Profile: Founded in 1987, first in Alberta, then BC and has recently opened an office in Fredericton NB. FirstClass has 45 employees. It has a network of agents and distributors in North America and Australia including SRA Technology Training, Amdahl Corporation, Skill Dynamics (IBM) Software AG and Applied Learning of Australia. The company has opened a new software development centre at the University of New Brunswick.

Product: A developer of computer based training courses, FirstClass has developed over 40 CBT courses, 19 are translated into French. Course titles include data processing, data communications using the PC and a line including key management subjects. New product is EdStart, a CD-ROM based system of high quality CBT products. The client makes a prepayment for hours of training and the system tracks usage at about \$20 to \$30 per hour. The potential annual market is estimated at approximately \$50 million.

International Activity: FirstClass has over 700 clients in 18 countries and has a strong distributor network. To circumvent shipping problems to Australia the company installed a production engine with a distributor in Sydney.

FirstClass uses two distributors in Australia, both subsidiaries of US partners and is investigating a third distributor, a wholly owned Australian company. FirstClass distributes an Australian product in Canada titled TypeQuick.

4.3.4 WorldLinx

Contact: Gordon Ades, Marketing
275 Matheson Blvd. East, Mississauga, ON
416 890 7519

Profile: WorldLinx is a Bell Canada Company, formerly IIS and recently, as a member of the Stentor Alliance, has announced the development of a new multimedia company (MMI) to supply content to the Information Highway. It currently supplies desktop audiographics and videoconferencing for education and training, also electronic systems and services.

Products: A diverse range of enhanced telecommunicatious services, desktop conferencing, distance learning and networks.

International Activity: WorldLinx has customers in USA, Finland, UK, France, Australia and New Zealand. WorldLinx began a close association with Telecom Australia, a natural partner, and introduced the concept of desktop conferencing to Australia. WorldLinx has a strong presence in Australia and built solid local knowledge through continuity with their initial contact at Telecom, Brian Adams, who moved to ElectroBoard in Brisbane, which is now their main distributor. In 1994 there were 42 systems sold in Australia. WorldLinx appreciates Australia's advanced technological and telecommunications infrastructure.

Issues: Exchange rate (the A\$ is falling). WorldLinx values the local distributor network. With the long distance, it is critical to have distributors who can virtually "go it alone". They need to put in a lot of time on their own so need to be highly motivated. Standards issue relating to interoperability between systems is holding back the development of the market.

WorldLinx would appreciate access to regular news clippings service. Introductions to prospective resellers is always useful. WorldLinx believes that trade missions are not needed in the early stages. They thought the best contribution is to develop a high profile for Canadian technologies, such as the Canada Booth at CeBIT '94, a trade fair held in Hannover in March. It had good impact, and attracted customers first, in working with Canada and then, with finding out more about specific companies there. Canada's image was very good.

4.3.5 Open Learning Agency

Contact: Mike Reddington, Director of Marketing
Glen Farrell, President, Tony Bates Director: Research and Strategic Development.
4355 Mathissi Place, Burnaby, BC, V5G 4S8
604 431 3000

Profile: OLA was formed in 1988 by joining the Open Learning Institute and Knowledge Network. It offers joint services with the Open University, Open College and Knowledge Network. It is the largest electronic publisher in Western Canada and is well regarded in Canada and internationally for the quality of instructional design of its learning materials. The OLA has a strong presence in international consulting for strategic and implementation issues of open learning. The main focus of the OLA is to meet the diverse education needs of BC through developing the capacity of other institutions in the province. It runs the Community Campus Network with over 70 locations in BC and is involved in many projects with private sector partners interested in developing new media and telecommunications based delivery systems.

Products: Educational and Training Programs, and components of programs for all sectors, industry specialists, instructional design, management and research services, teleconferencing services. The OLA also sells turnkey programs to foreign countries including training instructors, e.g. B. Admin. to Hong Kong where all course materials, method and media used in Canada were adapted for local use, local instructors were trained by the OLA.

International Activity: Extensive. The OLA has eight years experience in Australia selling course materials and consultancies. The OLA has had several significant consultancies in the last few years, assisting in the shaping of the Open Learning Initiative. It has a distribution agreement with Educational Media Australia.

It has had consultancies for the Commonwealth Department of Employment, Education and Training (DEET), the Open Polytechnic of New Zealand, and the Australian Vice-Chancellor's Committee. The OLA also has a MoU with Open Learning Australia for instructional television based programs at the undergraduate level.

Issues: The OLA believes that their high quality instructional design allows them to compete favourably with educational products from Australia and New Zealand. However, selling in Australia and New Zealand is not easy because of the "Not invented" here syndrome which affects sales. The OLA believes that the key is to develop an understanding that individual course components can be bought and adapted to fit local requirements. Adaptation processes and issues need to be addressed before purchase.

To sell educational products, the OLA believes it is vital to be up-to-date and aware of movements and pressures for change. The educational products area requires solid expertise and understanding. It can be an 18-20 month process to sell education programs. FAITC could assist by identifying projects of real economic value e.g. a computer conferencing project between Open Learning Australia and Open Learning Agency, BC. The Open Learning Agency raised issues relating to Federal Government support to public sector, provincial based education institutions, working in international markets. Participation by Canada in international education trade fairs needs to be coordinated so that Canada presents a united identity.

4.3.6 TeleEducation New Brunswick

Contact: Rory McGreal, Director
500 beaverbrook Court
Fredericton, NB, E3B 5X4

506 444 4234 Fax: 4232

Len Weeks Senior Policy Advisor
Economic Development and Tourism, NB

506 453 3018 fax: 3783

The province of New Brunswick provides an indication of the extent of the major changes which are occurring in Canada at the provincial level. Partnerships between public and private sector institutions are leading to joint development of products for export.

New Brunswick has recently established a province-wide network of over 40 distance education sites located in colleges, universities, hospitals, schools, libraries, community centres, private companies and private homes. The sites provide a virtual learning community linked by computers and teleconferencing technology. Different video, audio and computer conferencing systems and other media are integrated technologically, instructionally and organizationally.

Called TeleEducation NB¹, the programme was allocated a grant of \$10.5 million (including \$4.4 million for programme development), under the Cooperation agreement on Entrepreneurship and Human Resource Development. Cooperation among public and private sector institutions and government departments is an integral feature of New Brunswick's economic strategy. A special public-private sector task force was created by the Premier which recently published a special report, *Driving the Information Highway*. The new Minister of State for the Electronic Highway has been charged with implementing the recommendations.

New Brunswick is a small compact province with an advanced 100% digital infrastructure. The Advanced Training Technologies sector has been identified by the Department of Economic Development as a key development area for economic growth. TeleEducation NB is being used as a driver to support the development of local courseware and training industries. Programme development funding is being directed towards courseware and training projects that are not only important for the province, but also have export potential. The

¹ McGreal R, and Weeks L., (1994) TeleEducation Driving the Electronic Highway: The New Brunswick Model. GLOSAS News, GN/GE/Vol. IV., No. 1, April 1994

province-wide TeleEducation infrastructure is available for product testing and preparation.

The TeleEducation network takes advantage of the advanced infrastructure that has been developed by NBTel, the province-wide telephone company. The network has three branches for audioconferencing, digital teleconferencing (audiographics and software sharing), and computer mediated communication through NBNet (the province-wide net that also provides a gateway to the internet). Courseware developed in the province can be tested and refined on the network.

TeleEducation NB is working with federal departments, private sector companies, and with the provincial department of Economic Development exploring export opportunities and attracting advanced technology companies to the province.

The network has already established links with networks in other provinces, France, New Zealand and Australia exchanging information on teleconferencing. A Nursing programme from the University of New Brunswick is being delivered to Bermuda. A partnership with out of province organizations and NBTel has been struck to establish ISDN links with Europe.

The principal strength of the initiative in New Brunswick is the high degree of cooperation and collaboration in implementing projects among all sectors. The TeleEducation initiative is being used as a driver to promote the development of new economy industries. The new industries profit from the innovative environment and the advanced province-wide infrastructure for telecommunications and distance education. The province benefits from the increased accessibility to education and training now possible through the network. Students in all regions can now access the training they will need to survive in the information economy. In addition, by focusing on courses and courseware development for export, a viable new economy industry can be created.

Section 5 Activities Conducive to Increasing Trade

5.1 Challenges

Strategic marketing approach required in an expanding market.

The Learning Industry is undergoing such rapid change that most respondents were very keen to see a comprehensive description of the industry itself. While certain sectors, such as software developers, are well supported by industry associations such as the Canadian Association of Courseware Producers, the Canadian Advanced Technology Association, the Information Technology Association of Canada and the Software Human Resources Council Inc., most sectors operate separately to each other. Strategic alliances between companies in different sectors is an essential catalyst to promote industry wide awareness and development. The industry as a whole would benefit from a strategic marketing approach promoting Canadian Distance Learning products and services to the world.

This is still an expanding market. Predictions of growth in education and training are universal. And, although the role technologies will play in that growth are still uncertain, all interviewees were confident of a strong future for this industry. Early suppliers to this market will be in a good position to benefit.

Newcomers lack pedagogical awareness

Generally, those with a pedagogical perspective believe that there is a gap in understanding about the nature of learning (the pedagogical concerns), between newcomers to this industry and those who have been involved for a long time. It is still important to sell the concepts of technology based training. The best people to do that are the experienced educators and instructors who have been working with distance learners for decades.

The difference between distance education and classroom based instruction is becoming seamless. Teaching can be arduous and demanding. Technologies

which minimise preparation time and marking, freeing the classroom based teacher/instructor for more individual attention, are welcomed. Specialist training for dispersed populations also requires innovative approaches to optimise available resources. Linking classrooms across a region or across the country with a single instructor is technically possible. The critical issues include coordination and management of individual learners in addition to designing and developing supporting learning resources.

There is room for both low and high end solutions.

Public institutions and private organizations have different budgets for education and training. There is room for low end, low cost, robust technologies as well as for higher end technologies with multiple features. In schools and colleges in Australia, for example, researchers have found that excellent sound quality is a must, and that full motion video is a luxury. Audio graphics systems, which use black and white graphics only have proven to be effective. (Gray and O'Grady, 1993).

Standards for inter-operability required

Networking oriented education and training requires standard interfaces for interoperability of data and video equipment and platforms. In Australia, for example, where there has been a rapid uptake of videoconferencing in universities and TAFE systems, there are several operating standards which do not inter-connect. Systems are now isolated from each other. In Canada, the Consortium for Audiographics Teleconferencing Standards (CATS), was co-founded in 1992 by representatives of companies active in the industry such as WorldLinx and Confertech International, to address issues of standards and interoperability.

Investment strategies required

The new technologies: multimedia, CDI and CD ROM, require high upfront development investment funds. They also need global markets to recoup those costs. Canada is too small a market for many products. Strategic alliances and pre-sales can attract the investment needed to develop a high quality product for a niche market.

International education can benefit the industry

Bi-lateral and multi-lateral cooperation and collaboration in the design and development of education and training such as; the development of multimedia based courseware; international, full fee paying students enrolling in Canadian courses; or the selling of expertise in the development of distance learning systems ; are all ways in which international education is becoming a strong player in this industry.

International education creates strong partnerships through collaborations on course and program development. The Open Learning Agency for example, through its collaboration with the Open Polytechnic of New Zealand in the development of an Adventure Tourism course, benefits by expanding its course components and capturing a channel of distribution. The New Zealanders benefit by being able to offer a more comprehensive course than they could put together alone and by the international exposure provided through the global marketing strategies of the OLA. The relationship builds trust and awareness of common operating procedures and opens possibilities for transfer of technologies and skills in other areas.

Attracting top quality students from other countries to study in Canada as full fee paying students is a highly competitive market internationally. Foreign students are the next generation decision makers. Familiarity with Canadian culture and technologies in education and training can become an important future distribution channel.

Existing FAITC programs

Many respondents commented on the positive help and support they had received from Canadian Government representatives in the region. Many had also been assisted through the PEMD program and through projects with CIDA. However just as many had not sought any assistance and had developed highly successful market entry strategies on their own. Although this survey was too small to be representative, it did indicate that some companies were highly successful in the marketing of their products and services while others were struggling to make the transition. The industry is characterised by small to medium sized enterprises, often single owner controlled, with a history in

technical development and design, and now moving into wider distribution sometimes without appropriate expertise and personnel.

Promoting Canada Promotes the Industry

While companies saw some value in trade missions both in Canada and in the regions, they wanted more focus and purpose to these. Several companies commented on the need to raise the country's profile as a whole in this industry. The Canada Stand at the CeBIT '94 Trade Fair, in Hanover, was commented on as a truly valuable exercise in promoting Canada and in giving companies developing learning technologies a single point of reference which helped to differentiate them from the competition. Global competition is fierce in this industry and the reputation of Canada as a sophisticated developer and user of advanced learning technologies is perhaps the strongest marketing identity for Canadian companies.

5.2 A Forward Program

Respondents were generally agreed that market intelligence is essential and hard to get. Companies interested in the region want to know who is spending and who makes the decisions. They also wanted an indication of the size of budgets available.

A Database of Market Intelligence

A database of current affairs information, regularly updated, (for example, a media news clipping service on the region), would help companies stay abreast of political and infrastructure changes that effect business. It was suggested that FAITC use the communication technologies of the industry to develop an electronic communication network with interest groups in different sectors. Subscribers could add information to the knowledge base that is of general relevance.

Access to tender documents is also necessary. They provide information about developments as well as providing opportunities to compete.

Finding Prospective Distributors

Information about prospective distributors is a must in this region where reliance on local distributors is essential. It is very important to know that the distributor you choose is going to be the best one for your market. Bringing distributors to Canada would help establish local knowledge and provide opportunities for introductions.

Companies in the learning industry report on trade outside Canada being 85% to 95 % of their revenues. While much of this is in the United States, increasing trade is occurring with the European Community and with countries in the Pacific Rim. While Australia and New Zealand are relatively small markets, several companies reported they were equal to their Canadian activities, and are considered significant as they are an easy foothold in the Asia Pacific South Region.

Canada/European Community: a Model for Collaboration

Significant, and strategic alliances have been developed between Canadian companies in the Distance Learning Industry and the European Community through the successful intervention of Industry Canada (New Media Branch) and the DELTA Program in Europe. The work of this partnership has resulted in a higher profile for Canada in Europe through involvement in research and development opportunities that will also help strengthen the industry in Canada. Trade missions, conferences and joint publications continue to provide opportunities for the exchange of information and identification of issues of concern.

One of the projects identified by this partnership is the establishment of a market observatory of Canadian developments in this industry. The objectives of this observatory are to monitor trends in each of the provinces, to assess the impact of Canadian public policies, to compare Canadian and European developments and to identify areas for cooperation.

A Global Market Observatory

This project serves as a useful model for the development of a global market observatory. The industry would benefit from a differentiated focus on world regions. Collaboration between Government departments on the development of this project could result in real benefits to the Distance Learning industry.

Other collaborative projects on new media learning technologies proposed by the Canada /European Union also serve as useful models for the kinds of collaborations possible between Canada and other countries such as Australia and New Zealand. Australia has only recently developed national institutions through the Open Learning Initiative which could serve as a vehicle for collaborative ventures. For example the Open Learning Technology Corporation Ltd, has recently been established by Australia's Ministers of Education and Training to assist in the brokering of products and services to Australian education and training providers. It will develop a clearinghouse related to all aspects of open learning. It also intends to develop collaborative approaches to the purchase of equipment, courses and telecommunications services.

Canada already has a strong presence in the region. For example, the exchange of expertise between the Open Learning Agency of BC and the Department of Employment, Education and Training(DEET) in the establishment of Open Learning Australia; TVOntario has a strong involvement with the Australian broadcasting services through co-productions and Northern Telecom and Telesat have played significant roles in the design, development and supply of products and services in the modernization of Australia's telecommunication infrastructure. Companies such as WorldLinx and SMART Technologies are major suppliers of data and videoconferencing services to customers such as the Queensland Open Learning Network, the Australian Department of Defence, and the Open Polytechnic of New Zealand.

Need for a Forum to Promote National Coordination

The Distance Learning Industry would benefit from initiatives which would assist in developing a profile of the industry, both for members and for beneficiaries. The fragmented national infrastructure for education and training tends to isolate companies in their regions. It appears difficult for companies to get to know their counterparts and to learn from the experiences similar businesses have. A national forum or conference for the industry, initiated by industry associations in collaboration with interested government departments would assist in providing a focus on issues, policies, joint ventures,

precompetitive research and development and marketing strategies both nationally and internationally.

Need for Government to Government Contacts

Education and training tend to be conducted under strong government control. Information about current and emerging policies can be maintained through strong intergovernmental links. Commercial companies are often held in suspicion by government bureaucrats and so do not gain easy access to decision makers in order to develop awareness of new and emerging technologies. High level and frequent intergovernmental liaison with feedback to the industry would be very valuable. Opportunities to meet Government representatives when they visit Canada was suggested as a useful means of establishing positive relationships which could be followed up more easily in country.

Appendices

Australia Contacts

Many of the reports by and for Commonwealth Government departments are available from:

The Australian Government Publishing Service

- Mail Order Sales-
GPO Box 84
Canberra, ACT. 2061

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Australian Distributors working with Canadian Companies

Data-Tech Systems Pty Ltd
Suite 20A 273 Alfred St, North Sydney, NSW, 2060
Brad Shoffer
PH 61-2-955-3611
FAX 61-2-975-2966

Dataflow Computer Services Pty Ltd
15 Merton St, Zetland, NSW, 2017
Dr Jeff Tobias
PH 61-2-310-2020
FAX 319-2676

EdSoft Sydney
Jan Henderson
PH 61 2 956 3808
FAX 61 2 906 5594

Education Media Australia
Ken Widdowson, Madeleine Moore
PH 61 3 699 7144

Electroboard Pty Ltd
Brian Adams
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FAX 61 7 852 2838

SIR Pty Ltd
10 - 18 Cliff Street, Milsons Point, New South Wales 2061
Rohan Lewis
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Professional Associations.

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Commercial Education and Training Services Campaign, Results Of Phase II, By George Tillman Consulting

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