

Developing a Community Technology Strategy

**The Role of Information and
Community Technology in a Learning
Community**

GLS Learning Guide No. 6

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Preface

The growing significance of information and communication technology (ICT) in economic activity, education, and in society generally means that much is to be gained by a community in adopting a strategic approach to the development of this tool so as to serve a comprehensive range of community objectives and purposes. This Guide is concerned with such a Community Technology Strategy.

The context of the Information and Knowledge Society means that there is a compelling case for all members of a community having the opportunity to acquire a platform of basic ICT skills. Digital literacy for all should now be seen as an essential addition to our traditional view of literacy. Addressing the digital divide in a community is a challenge that any community aspiring to be a learning community should take up if it truly aspires to be a successful and inclusive learning community.

A Community Technology Strategy can be an instrument for progressing this range of objectives through strategic planning and collaborative partnership action. All parties will gain through a successful collaborative action, so a Community Technology Strategy should have the active support of all sections of a community.

Information and communication technology can be, if well applied, an instrument for the empowerment of individuals, families, and communities. Identifying the conditions and requirements for good use of ICT is therefore a matter that requires close attention by all sections of a community. Much can be gained by collaboration and partnership in exploring the requirements for good use and devising strategies to achieve this.

In the context of the global village, ICT should be at the cutting edge of the on-going process of learning that drives a community towards being world class. There is much scope for creative thinking and innovation in devising strategies to ensure that all sections of the community benefit from the power and potential of information and communication technology. Making good use of technology so that all members of the community benefit, is truly a core feature of a successful learning community.

Peter Kearns

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1. TECHNOLOGY AND LEARNING IN AN INFORMATION SOCIETY

There has been a growing international interest in the role of information and communication technology (ICT) as a key instrument in building a learning community in the context of the globalised Information Society.

So pervasive has been the impact of ICT on economic activity, and on society generally, that the emerging socio-economic conditions are often termed an Information Society.

In an Information Society the use of information and knowledge is increasingly the key for economic growth and development. The ability to produce and use information and knowledge effectively is therefore a key requirement for economic success in this context.

The growing significance of the Internet in economic and social activity is a tangible indication of the changes that are occurring in the emerging Information Society.

The Technology Revolution

- email is an increasingly significant form of communication to anywhere in the world which is encouraging new communication patterns;
- e-commerce is being used in a growing number of firms;
- e-learning is enabling new forms of workplace learning to occur, as well as learning in many social contexts;
- the world wide web is enabling unprecedented access to information and knowledge;
- there is a growing number of knowledge workers in many industries whose core capability is their capacity to generate and use knowledge;
- the rise of a creative class is accompanying these changes.

These changes are revolutionary in their cumulative implications for communities so that smart communities are taking steps to harness the power and potential of ICT to further their aspirations and objectives.

A central feature of the impact of ICT on work and society is that it accelerates the pace of change in work practices, and in many aspects of society. The impact of the personal computer over the last decade illustrates this feature, as does the impact of ICT on industries such as banking and tourism.

While technology opens up opportunities to extend the range and quality of learning in creative and innovative ways, it also presents a series of challenges which need to be addressed if the potential benefits for community are to be realised. These challenges include the following.

The Challenge of ICT

- ensuring that all members of the community gain basic ICT skills and achieve digital literacy;
- ensuring that e-learning is well used in many community contexts including small business;
- raising awareness of the potential of e-commerce in the business community and facilitating its use;
- ensuring that effective learning strategies are integrated with the use of ICT so that there is general understanding of how we learn with technology;
- ensuring that steps are taken so that technology adds to the quality of life and the richness of learning experiences.

Community Technology Strategy

A Community Technology Strategy is concerned to address these issues and involves collaboration and partnership among stakeholders in the development of the strategy and in its implementation. It is therefore directed at a range of economic, educational, social, access and equity, and cultural objectives. ICT should be seen as a tool for progressing the vision of the community as a successful and inclusive learning community.

National, State/Territory and International Action

The Commonwealth and State and Territory Governments have been promoting good practice in the use of ICT in a number of ways. Some examples are:

- **National Office of the Information Economy (NOIE)**
NOIE is the national agency established to promote the Information Economy in Australia with a particular role in furthering the Commonwealth's *Strategic Framework for the Information Economy* which was released in January 1999. Information on the Strategic Framework, and other NOIE initiatives may be obtained from the NOIE web site. (<http://www.noie.gov.au>)
- **Education**
The Commonwealth and States in 2000 endorsed *Learning for the Knowledge Society: an Education and Training Action Plan for the Information Economy*. This Action Plan comprises separate Action Plans

for schools vocational education and training and higher education. and State and Territory Governments are taking action within the structure of the Plan. The Action Plan may be found on the web site of the Department of Education, Science, and Training and on the Commonwealth/State portal EdNA Online.

(<http://www.dest.gov.au/edactplan.htm>)

- **The GLS ICT Policy Study**

The Department of Education, Science and Training in 2001 commissioned Global Learning Services to undertake a national and international study of policy for ICT in education. This study led to Australian and International reports and a data base of policy summaries. The data base may be searched through EdNA Online (<http://ICTpolicy.edna.edu.au>) and the two reports are available from the DEST web site (<http://www.dest.gov.au>) and the EdNA Online data base.

- **e-Commerce**

e-Commerce has been promoted by both Commonwealth and State agencies including NOIE. Information on e-commerce may be obtained from the NOIE web site. This includes a 2001 report on business-to-business (B2B) e-commerce (<http://www.noie.gov.au>). The Commonwealth also funds the Information Technology Online Program (ITOL) which fosters business to business e-commerce solutions, in particular by small and medium enterprises. Information on ITOL projects can be obtained from the NOIE web site (<http://www.noie.gov.au/projects/ecommerce/ITOL>) while further information on ICT initiatives taken by communities can be obtained from the web site of these communities. For example, Dubbo City Online provides information on an ICT innovation taken by Dubbo involving 1800 local businesses (<http://www.dubbo.com.au>).

- **International Developments**

International agencies such as OECD and the European Commission are actively promoting good practice in the use of ICT and most leading OECD countries have national ICT strategies, analogous to the Australian strategy cited above. In the case of education, there is an overview of national strategies in eight leading countries in the GLS International Report on ICT Policy in Education. Appendix 1 of this report gives a list of key web sites in these countries where further information can be obtained.

The European Union demonstrates good practice in integrating its policies for E-Europe (<http://www.europa.eu.int/information society/eeurope/actionplan>), lifelong learning (<http://www.europa.eu.int/comm/education/life/>), and e-learning (<http://www.europa.eu.int/comm/elearning>).

Concepts for the Information Society

In developing a Community Technology Strategy, it will be necessary for a community to become familiar with key concepts that underpin the ICT role in the Information Society. A glossary of some key terms is given in Appendix 1 with a

focus on terms most relevant to a learning community. Terms such as e-learning, digital literacy, learning portal, and e-commerce are included in the glossary.

Sections that Follow

The sections of this Guide that follow discuss the e-learning revolution, ICT in business, developing a Community Technology Strategy, and addressing the digital divide in the community. In developing a Community Technology Strategy, a necessary starting point is to assess the current status of the community in becoming “digitally literate” and effective, so that needs and priorities are identified. In this process, guidelines such as the following should be addressed.

For discussion

1. How well are the implications of the Information Society understood in the community?
2. Who are the main stakeholders in the development of a Community Technology Strategy in your community?
3. To what extent is e-commerce used in business, and how well?
4. Have small firms been able to harness e-learning in the workplace?
5. Have schools and VET developed innovative strategies to link learning and technology so as to deepen and extend learning by students? If not, what are the barriers?
6. What sections of the community do not possess basic ICT skills including the capacity to access the Internet. How numerous are these people?
7. What resources exist in the community to provide basic ICT skills for all those who wish to acquire these? Are there barriers to their use?
8. Has a strategy been developed to link the role of the community library to a community ICT strategy?
9. What do you see as the main needs and priorities?

2. THE E-LEARNING REVOLUTION IN SCHOOLS AND VET

The impact of ICT on learning in many contexts is so significant that it is valid to believe that we are in the early stages of an e-learning revolution that will change the way people learn.

However, the impact at present varies between sectors, and various barriers are constraining the potential impact of ICT in supporting lifelong learning in many contexts throughout life. The influence of ICT is raising a broad spectrum of issues about how people learn, and how technology can best stimulate, support, and extend learning. More research and innovation is required in clarifying these issues.

The term e-learning is becoming a general term in international usage. It covers a wide range of technology-based applications and processes, such as web-based learning, computer based learning, virtual classrooms, and digital collaboration. It includes the delivery of content via the internet, intranet/extranet (LAN/WAN), audio and videotape, satellite broadcast, interactive TV, and CD-Rom.

While e-learning is emerging in many situations, the notes that follow focus on schools and VET while other aspects are taken up in the chapters that follow. A community could also consider the potential impact on clubs and societies, unions, and other contexts that are significant in the community.

Schools

School systems around the world have developed strategies to promote the effective use of ICT in the work of schools. A number of these strategies are discussed in the recent International Report that Global Learning Services prepared for the Department of Education, Science and Training.¹

National action in Australia has been stimulated by the strategy for schools *Learning in an Online World*, one of the three sectoral strategies in the national strategy *Learning for the Knowledge Society*.

State education departments are promoting the use of ICT in schools within the agreed framework which covers five action areas: People, Infrastructure, Online Content, Applications and Services, Policy and Organisational Framework, Regulatory Framework. It is recognised that achieving effective use of ICT in schools will require action across each of these areas.

The GLS International Report concluded that policy for ICT in schools had progressed through two stages of development in all the countries studies while a

¹ Towards the Connected Learning Society: An International Overview of Trends in Policy for Information and Communication Technology in Education, DEST, Canberra, 2002 (<http://www.dest.gov.au>).

few countries were on the threshold of a third stage of development which would change the way people learn.²

These stages were:

Stage One : rolling out computers into school and colleges with some professional development of teachers and development of online content;

Stage Two : mainstreaming and integrating the role of ICT into education in a more strategic way with more concern for objectives, and with linkages forged to overall education strategies.

Most education systems have progressed to stage two, and all Australian education systems are implementing stage two strategies.

However, a few countries are currently developing ideas for a revolutionary third phase of development which would realise the full potential of ICT in education and change the way learning occurs in schools. These countries include Sweden, Denmark, the Netherlands and Canada which are linked in an ICT League to exchange ideas on how to progress to this revolutionary third phase of development.³

There are two key thrusts in policy to promote the effective use of ICT in schools. These are:

- ensuring that all students acquire basic ICT skills as a platform for lifelong learning; and
- encouraging innovation and creativity in the ways ICT is used in schools so that the potential of ICT as a tool for producing motivated lifelong learners is realised.

Comment follows on these objectives.

Achieving Digital Literacy for all Students

There is a compelling case, widely recognised by governments, that all students should achieve basic ICT skills as an essential platform for lifelong learning. This is often seen as an ability to use computers and the Internet although the concept of digital literacy, discussed below, is usually defined in broader terms.

Australian governments have accepted the goal of basic ICT skills for all school students and national testing of these skills will commence no later than 2003 in

² Ibid, pp.28-29.

³ Ibid, pp.28-29.

Years 5/6 and 9/10.⁴ Some states have already commenced their own assessment programs.

While all students achieving basic ICT skills is essential, both OECD and the European Union have defined the concept of digital literacy in broader terms. OECD in 2001 defined digital literacy in the following terms.

*Just as “conventional” literacy is more than a basic ability to read a sequence of words, digital literacy is more than the ability to use a computer in simple ways, and both are fundamentally important. It implies a sophisticated set of competences pervading workplace, community and social life, including information-handling skills, and the capacity to make judgments about relevance and reliability when searching on the Internet. Digital literacy is a vital part of the foundations for lifelong learning and must have a high priority within the curriculum.*⁵

The European Union also adopted a similar approach to OECD that went beyond technical computer and Internet skills, and which links digital literacy to the essential generic competencies required for lifelong learning.

Governments such as Singapore have adopted this approach, so that basic ICT skills are seen as a tool for achieving the essential “skills of the future”.

*The skills required for the future will centre on thinking skills, learning skills, and community skills. IT-based teaching and learning will be one of our key strategies for equipping our young with these skills.*⁶

The question of what are the essential generic skills required by the information age has attracted considerable attention in recent years. The Managing Director of Global Learning Services, Peter Kearns, prepared a research review on this subject in 2001 for the National Centre for Vocational Education Research (NCVER). This report is available through the NCVER web site. (www.ncver.edu.au).

This report concluded that four clusters of interlocking skills were required linked to a core of personal mastery and self direction which drive the on-going development of these skills. The four clusters are:

- learning, thinking and adaptability skills;
- interpersonal skills;

⁴ This was decided by the Ministerial Council on Employment, Education, Training and Youth Affairs (MCEETYA) in July 2001.

⁵ OECD 2001, Learning to Change: ICT in Schools, OECD, Paris, p.15.

⁶ Ministry of Education Singapore 1997, Masterplan for IT in Education, Singapore, p.1.

- work readiness and work habits;
- enterprise, innovation and creativity skills.⁷

There is a strong case that digital literacy should be linked to the on-going development of these essential generic skills as a platform for lifelong learning.

Encourage Innovation

The GLS review of international development showed that traditional practices in the way schools operate often inhibit achieving the full potential of ICT as a tool for lifelong learning. Rigidities in the organisation and regulation of schools with fixed timetables and curriculum are often seen as barriers to achieving the full potential of ICT as a tool for learning. It is sometimes argued that schools reflect the requirements of an industrial society in these ways rather than the imperatives of an information age school preparing students to be lifelong learners.

For this reason school systems around the world are increasingly adopting strategies to encourage innovation in the way ICT is used in schools. This need has been emphasised in a number of international reports.

A considerable gap separates the educational technology now in use from the incredible potential offered by these technologies. To close the gap, education systems must continue to innovate.

Federation of American Scientists, 2002.

The overarching issue is the need to accelerate the speed of pedagogical and institutional change – many aspects of our education systems need to be re-evaluated.

Summit Declaration, European e-Learning Summit, May 2001

A range of innovation strategies have been promoted.

Some innovation strategies

- Building networks to encourage the flow of new ideas.
- Innovation in teacher professional development
- Developing and promoting models of good practice
- Making materials to foster innovation available through web sites
- Implementing whole-of-community strategies with extensive partnership development
- Innovation in new forms of partnership.

⁷ Kearns P 2001, Generic Skills for the New Economy, NCVET, Adelaide.

In developing a Community Technology Strategy a community could consider whether any of these strategies might be built into your approach.

ICT stimulates the building of networks to encourage the flow of new ideas. While this may happen through networks of schools collaborating and sharing ideas through the use of email and other technologies, in some cases major government programs have been put in place to foster network building and the flow of new ideas.

These networks include:

- **European SchoolNet** which operates as a European network of national networks with 19 countries linked to the network which has a secretariat and website in Brussels.
(<http://www.eun.org>)

SchoolNet aims to encourage co-operation between schools in Europe and the exchange of experience. It includes a range of programs such as the European Principals Online initiative, a Multimedia project, and a virtual magazine for teachers.

- **Canadian SchoolNet** which is similar in a number of respects to the European SchoolNet and which has a similar focus on grassroots collaboration and partnership between schools. This program includes a fund to support Grassroots initiatives by schools which build up networks of collaborating schools. It is worth exploring the Canadian SchoolNet web site to see the range of initiatives encouraged by this program.
(<http://www.schoolnet.ca>)

ICT can be used for teacher professional development to support networks of teachers across schools that share ideas and collaborate in finding innovative solutions. Such networks of teachers can be seen as learning communities (communities of practice). This approach has been adopted in VET professional development of teachers under the national Re-framing the Future program. Geelong is one of the Australian learning communities which has adopted this strategy.

Networks built up in these ways can be used to share and promote models of good practice. In some cases access to these models is facilitated through a community web site portal with links to individual schools.

A wide range of information and materials to encourage innovation in the way ICT is used in schools is now available on web sites around the world. These web sites include materials for teachers and students. In addition to the European Union and Canadian SchoolNet web sites, these include the following:

- the **British National Grid for Learning** which has links to a range of associated web sites such as the Virtual Teacher Centre.
(<http://www.ngfl.gov.uk>)
- **edu.Quest** a joint development by the Singapore Government and the Apple Computer company which encourages teachers and students to design their own learning and to research subjects of their own choice.
(<http://www.moe.edu.sg/eduquest>)
- **GEM (Gateway to Educational Materials)** which is the American equivalent of the British National Grid for Learning and the Australian EdNA Online. GEM provides access to lessons, curriculum units, and other resources. It can be browsed by subject and key word.
(<http://www.thegateway.org>)
- **EdNA Online** is the portal for Australian educational resources online which provides access to a wide range of educational resources. Web sites in State and Territory education departments can be accessed through this portal.
(<http://www.edna.edu.au>)
- **The Grid Club** is a British web site restricted to children aged 7 to 11. It provides games, puzzles, and a range of fun activities for children in this age range to encourage an interest in learning through technology.
(<http://www.grid.club.com>)

These resources can be used by a community in gaining ideas on how innovation and fresh ideas can be encouraged in the use of ICT in schools so that technology becomes a tool for lifelong learning in contributing to schools producing students who are motivated lifelong learners with the skills and motivation to keep learning throughout life. Some questions that communities might consider in addressing these issues are set out below.

E-learning in Vocational Education and Training

Like the school sector, vocational education and training (VET) has taken action to encourage online learning. A national strategy *Flexible Learning for the Information Economy* has been incorporated in the *Learning for the Knowledge Society* Action Plan to provide a framework for national collaboration and a five year development strategy titled Australian Flexible Learning Framework for the National VET System (FLAG) is being implemented.

The national VET strategy is built around the concept of flexible learning which is seen as a change process with the VET sector progressively adopting the tools of

the new economy – “innovative ideas and technology embedded in its products and services”.⁸

This national VET strategy is progressed through annual strategic plans so that there is a rolling development program over the period 2000 – 2004. Information on the annual strategies and projects may be downloaded from the Flexible Learning web site (<http://flexiblelearning.net.au>).

Similar issues have arisen with the implementation of the VET national strategy as with schools. There is a similar need to foster innovation and on-going change, and to address the barriers to cultural change in the VET sector.

In developing a Community Technology Strategy, regard should be had to these national objectives and developments so that there is a focus on how to progress flexible learning in the work of the VET sector in your community. This is likely to require similar innovation strategies to those in schools while having regard to the experience of the VET sector in implementing its five year flexible learning strategy.

A particular challenge for the VET sector resides in its role in stimulating and supporting workplace learning and ensuring that its programs are well integrated with strategies adopted by employers to strengthen workplace learning. This is likely to be a key thrust in developing a Community Technology Strategy. The role of VET providers as intermediaries in promoting good practice in workplace learning, including effective use of workplace e-learning is likely to become increasingly significant. This role should be considered in developing the Community Technology Strategy.

Review of key ideas

- The need exists to integrate ICT with effective learning strategies in the context of the globalised information society.
- This will require creativity and innovation in the work of schools and VET.
- Online resources should be well used in changing the way students learn.
- Achieving digital literacy for all should be a key aim of schools and VET.
- This should be linked to fostering the cultivation of essential generic skills.
- Collaboration, partnership, and the building of networks to foster the flow of new ideas should be actively fostered.

⁸ Flexible Learning for the Information Economy, op.cit., p.63.

For discussion

1. What are the best ways to foster innovation and creativity in the use of ICT in schools and VET in your community?
2. In what ways can partnerships and networks be built to support such developments, including the flow of new ideas and good practice?
3. What contribution can employers make to these objectives?
4. In what ways can teacher professional development be strengthened in contributing to effective use of ICT in schools and VET?
5. What objectives might your community have in achieving digital literacy for all?
6. In what ways could the VET sector perform a useful intermediary role in promoting the effective use of e-learning in the workplace?

3. E-LEARNING IN THE WORKPLACE

A key area of the e-learning revolution exists in the impact that this approach is having on workplace learning. It is widely recognised that the conditions and imperatives of the information and knowledge economy require a strengthened capacity to generate, manage, and use new knowledge in the workplace, along with a complementary requirement to strengthen workplace learning.

It is not surprising, in this context, that leading corporations around the world are taking action to strengthen workplace learning, often through the introduction of sophisticated e-learning systems. However, small businesses are less well placed to bear the development and implementation costs associated with e-learning systems so that the danger exists of a new form of digital divide emerging in the business world between large and small firms.

This is a key challenge for a community in developing a Country Technology Strategy: to take action to enable small firms to strengthen their capability for on-going learning and innovation through access to e-learning strategies. In addressing this challenge, collaboration and partnership action will be required.

It will also be necessary for a community in considering the issues in this area, to bear in mind that increasing numbers are becoming knowledge workers whose core capability will be a capacity to handle the generation, management and use of knowledge. Learning processes underpin each of the phases of the knowledge cycle so that raising the learning capability of the workforce is a prime consideration of the knowledge economy.

E-learning in the Corporate Sector

Large corporations have been active in implementing e-learning systems. Often these are sophisticated blended learning systems which combine e-learning with other learning strategies such as face-to-face instruction and action learning.

E-learning systems developed by firms such as IBM, Intel, and Ernst and Young illustrate the potential of this approach. IBM estimates that it saved \$24 million from its new approach to its e-learning management training process, involving a need to train 30,000 managers worldwide, in place of its former training approach which required managers to travel away from the job for management courses.⁹

The new IBM e-learning approach involves a four-tier system which blends different learning strategies. These are:

Tier 1 : Information and just-in-line online performance support;

Tier 2 : Interactive online learning;

Tier 3 : Online collaboration;

⁹ Mantyla K 2001, Blending e-learning, ASTD, Washington, p.31.

Tier 4 : Classroom learning labs.¹⁰

The blending of this range of learning strategies in this four-tier structure enables IBM to gain the benefits of each of these approaches to learning. Comparable blended learning strategies have been developed by large corporations such as Intel, Marriott, and Ernst and Young.

A feature of these systems is that they usually combine e-learning with knowledge management systems. Such systems are often developed so that they build learning networks of people which function as communities of practice. The systems are flexible and can be adapted to changing circumstances. With their focus on on-going learning in the workplace, they also serve to build up a learning culture in the firm.

The impact of the e-learning revolution in the workplace is increasingly seen as the beginning of a paradigm shift from a training paradigm to a learning paradigm. Professional bodies such as the American Society for Training and Development (ASTD) have been in the forefront of the learning revolution in workplace learning.

ASTD in June 2001 convened a Future Search Conference on Workplace Learning to explore future directions for workplace learning. This conference, with 64 invited participants from around the world (including the author of this Guide), identified twelve common themes which would shape the future of workplace learning. (<http://www.astd.org/futsrch.phtml>)

These included:

- intellectual capital as the lifeblood of the organisation;
- developing a sense of social responsibility;
- effective management of knowledge and learning;
- developing partnerships and collaboration;
- fostering lifelong learning.

The ASTD approach to the future of workplace learning is also set out in a Manifesto of January 2002 titled *Leading the Learning Revolution: A Manifesto for the Whole Community of Learning and Performance Professionals*.

The examples given above illustrate how revolutionary changes are occurring in the approach to workplace learning in large corporations which harness the power of ICT. However, in Australian learning communities most businesses are small firms so that a key issue for community technology strategies is whether the benefits of e-learning in the workplace can also be made available for small and medium enterprises.

¹⁰ Ibid, pp.36-38.

Small Business

It has long been known that less workplace training occurs in small firms than in large firms, and that a number of barriers serve to limit the amount of formal training and staff development in these firms. A recent report on the provision of training and learning services for small business by the author of this Guide confirmed this traditional view.¹¹

However, the Kearns report also showed that although less formal training occurred in small firms, considerable informal learning took place. A pertinent question is whether the emergence of e-learning can be linked to the informal learning preferences of small businesses in ways that are convenient, low cost, and flexible, and responsive to the preferences of people in small businesses.

Our review of small business learning and training also showed that a good deal is now known about strategies that work in the small business environment and which suit the preferences of small business people.

These questions were examined in the Small Business Professional Development Program (SBPD) which was funded by the Commonwealth and which operated between 1995/6 and 1999.

The SBPD approach was based around eight collaborative self-help models. These were:

- mentoring;
- building networks and clusters;
- action learning;
- workplace coaching;
- diagnostic services;
- direct training;
- attracting participants;
- benchmarking and low risk taking

Pilot projects funded under SBPD showed that these strategies could be effective when well implemented. Each of these strategies could be combined with e-learning in blended learning systems along the lines of the blended learning approaches adopted in the corporate sector.

However, while e-learning can support workplace learning at times convenient for firms and their staff, a question remains as to how the costs of e-learning development might be borne by small firms.

In this connection, the strategy of building networks and clusters of firms so that costs are shared would seem attractive. These networks might be built up on an

¹¹ Kearns P 2001, Are Two Worlds Colliding? The Provision of Training and Learning Services for Small Business, NCVET, Adelaide. This report is currently under publication and should be available from the NCVET web site shortly. (<http://www.ncvet.edu.au>).

industry basis (eg tourism and hospitality, retail, community services) with an industry organisation providing the leadership in organising the network.

The intermediary or brokerage role in building networks of firms is crucial, and could be performed by a training provider, such as TAFE, as well as by an industry organisation or group training company.

An increasing range of materials for online learning is now becoming available including the multi-media toolboxes funded by ANTA to support Training Packages. A training provider could play a useful role in adapting toolboxes to meet the priority needs of local firms.

However, it is important to recognise that the principal demand of small firms for learning and skill is for modules which are short, sharp, and specific, and directly relevant to the main interests of small firms, rather than for longer courses leading to VET credentials. In some cases individuals in small firms may wish to acquire such credentials so that questions of recognition of prior learning are likely to arise.

Review of key ideas

- There are growing pressures to up-grade workplace learning in the context of the globalised knowledge economy.
- An increasing number of workers should be recognised as knowledge workers requiring competence in knowledge and learning skills.
- There has been a rapid expansion of e-learning in the corporate sector, often in sophisticated blended learning systems which combine e-learning with other learning strategies in synergistic ways.
- In this context, a key issue is how to meet the needs of small firms for workplace learning in ways that are responsive to the preferences of small business people.
- The value of collaborative self-help strategies such as mentoring and building learning networks of firms has been demonstrated in pilot projects. There is a challenge for communities in finding cost-effective ways to combine these strategies with e-learning in blended learning strategies for small firms.

For discussion

1. To what extent have small businesses in your community made use of e-learning strategies in the workplace?
2. Are there particular barriers impeding such development?
3. In what ways could learning networks of small firms be built up in your community?
4. Who might undertake the intermediary role in building networks?
5. What are the priorities for workplace learning?
6. What would you like to achieve in the next three years?

4. PROMOTING E-COMMERCE IN BUSINESS

While there has been a significant development of e-commerce in business around the world, the impact has been patchy and many firms have not yet realised the benefits of e-commerce. This is particularly the case in the small business sector where the incidence of e-commerce is often patchy with factors such as industry sector and location influencing the uptake.

E-commerce in a learning community should be seen as the natural companion of e-learning, with maximum benefits obtained when business strategies link e-commerce and e-learning so that a learning culture of continuous improvement is built up through harnessing ICT for learning and knowledge generation, and a range of business purposes.

Useful information on e-commerce can be obtained from the web site of the National Office of the Information Economy (NOIE): <http://www.noie.gov.au>. NOIE has defined e-commerce in the following terms:

E-commerce is every type of business transaction or interaction in which the participants propose or conduct business electronically.¹²

This broad definition of e-commerce covers all forms of electronic processes with the Internet or online technologies currently the most significant aspects.

Within this broad definition two main types of e-commerce have emerged. These are:

- business to business (B2B) e-commerce which is typically concerned with transforming the back office functions of firms to make them more efficient so that there may be impacts along the entire value chain of an industry;
- business to consumer e-commerce harnesses ICT in developing relations and sales with consumers and includes the role of web sites of firms, and electronic marketing and sales strategies.

Up to now, B2B e-commerce has had a larger impact across the economy than business-to-consumer e-commerce. This has involved using e-commerce methods for incremental improvements to existing business practices including down-to-earth practical issues such as demand forecasting, stock replenishment, and value network management.

In these ways B2B e-commerce is about making existing processes more efficient, and so leading to a process of reducing costs on an on-going basis. B2B e-commerce can be an instrument for on-going learning and continuous

¹² NOIE 1999, Australia's E-commerce Report Card, Canberra.

improvement in the workplace. This impact will be maximised if e-commerce is linked to an e-learning and performance strategy in a firm.

Examples of e-commerce strategies in small businesses may be found in a summary of 34 case studies prepared by Ernst and Young for NOIE.¹³ This study found that:

- 62% of cases used B2B forms of e-commerce with only 38% having a primary focus on higher sales in new and existing markets;
- the majority of firms (65%) invested less than \$15,000 in e-commerce with only 35% investing more than \$15,000;
- for all businesses, the biggest component of establishing e-commerce was the cost of developing a website (59%);
- on average 55% of the gross benefits of e-commerce came from efficiency savings and the remaining 45% from additional revenue;
- the biggest cost for small firms was the value of time spent responding to email correspondence generated by the website.
- the average investment of all firms in the case studies in e-commerce was about \$24,000 with investment related to the size of the firm.
 - small firms : less than \$5,000
 - medium firms : \$5,000 to \$15,000
 - large firms : greater than \$15,000

Barriers to e-commerce

The Ernst and Young case studies showed that the greatest barrier to e-commerce was the lack of understanding of many people in small businesses of the nature of e-commerce and its potential benefits. A common perception was that e-commerce involved selling products or services over the Internet.

This means that a learning community in promoting the use of e-commerce in business faces the challenge of fostering awareness and understanding of the nature of e-commerce, and its potential benefits for small firms.

Building learning networks of small business people as communities of practice can be an effective approach based on the collaborative self-help principle. Materials such as the NOIE case studies can be valuable resources in this context.

¹³ Ernst and Young, Advancing with E-commerce, NOIE, Canberra.

Promotion of e-commerce

A number of Commonwealth and State programs have evolved to promote e-commerce in business. These include the Commonwealth's *Information Technology Online program* (ITOL) administered by NOIE and a number of State programs which usually provide services through local Business Enterprise Centres (BECs) in most States. Where BECs, or similar business centres, exist in communities they should be involved as an active partner in a learning community development.

Information Technology Online

ITOL is administered by NOIE as a program designed to accelerate the national adoption of B2B e-commerce solutions, especially by small and medium enterprises. In doing this, ITOL aims to:

- encourage collaborative industry based projects which aim to accelerate the adoption of business-to-business e-commerce solutions, especially by clusters of SMEs; and
- foster the awareness and strategic tape-up of innovative e-commerce solutions within and across industry sectors which deliver sustainable economy wide returns and contribute to increased competitiveness.

The focus of ITOL on supporting clusters of small firms links to the e-learning strategy of building learning networks of small firms as communities of practice which is discussed in Chapter 3. This suggests that opportunities exist to link strategies for promoting e-commerce in small firms with the promotion of e-learning in these firms through building clusters of firms for both purposes.

Useful information on ITOL strategies may be obtained from the NOIE web site including the NOIE Guide to B2B e-commerce.

<http://www.noie.gov.au/projects/ecommerce/ITOL>)

The ITOL site includes links to web sites where information on innovative projects may be found which can serve as models for communities wishing to develop their own strategies to promote e-commerce among small firms.

Some models of interest include the following:

- **Dubbo City Online** which provided 1800 local businesses with e-commerce opportunities. Over 2000 businesses are listed in Dubbo City Online along with news and current developments and online shopping. (<http://www.dubbo.com.au>)

- **Master Builders I-Build Project** which supported a whole-of-industry portal and promoting awareness in the industry of IT opportunities, including IT online training courses.
(<http://www.mbau.com.au>)
- **E-Global: Aged Care Online Portal** which provides a portal to link a range of services, including training, online.
(<http://www.agedcareonline.org>)
- **E-Culture Continuum** is a project based in Albany in WA designed to pilot an automated intelligent e-business tool intended to increase and strengthen e-business transactions. Albany Chamber of Commerce, Edith Cowan University and Albany GateWay comprises this consortium.
Contact Jo Hummerston joh@albanyddi.org.au
- **Mid North Coast E-commerce and Portals** is a project which aims to create a virtual business community among the 19,000 businesses in the Mid North Coast of NSW. The project will increase B2B awareness and uptake. The consortium members include Bendigo Bank, Coffs Harbour Business Enterprise Centre, and Southern Cross University.
Contact Geoff Beggs: gbeggs@coastcall.com.au

These examples illustrate that a range of strategies are available for a community which wishes to promote e-commerce in its business sector. These include:

- a comprehensive program across various industry sectors as in the Dubbo Online approach;
- an industry based strategy with an industry association taking the lead role as in the Master Builders I-Build project;
- a broad sectoral strategy where a number of organisations combine to support a strategy as in the E-Global: Age Care Online Portal.

There would be much to be gained by fostering discussion in your community of which approach is likely to be most relevant to the needs of your community.

Review of key ideas

- B2B e-commerce has been the main form of e-commerce implemented in Australia to date with less focus on business to consumer e-commerce.
- B2B e-commerce is focussed on making existing business processes more efficient and so leading to a process of reducing costs on an on-going basis.
- Most will be gained by linking the promotion of e-commerce to the promotion of e-learning in the workplace so that a culture of learning and continuous improvement is build up along with B2B e-commerce thrusts.
- A strategy relevant to promotion of e-commerce in small business is to foster e-commerce through clusters of firms, either on an industry basis or cross industry sectors.
- E-commerce and e-learning objectives should be built into a learning community strategy.

For discussion

1. To what extent have e-commerce methods been adopted by businesses in your community?
2. What forms of e-commerce are most common?
3. Are there particular barriers to the wider adoption of e-commerce? If there are, how might these be addressed?
4. In what ways might strategies to promote e-commerce and e-learning be integrated? Who would be the main stakeholders in such action?
5. How could clusters of firms be built up to extend e-commerce in your community?

5. DEVELOPING THE COMMUNITY TECHNOLOGY STRATEGY AND ADDRESSING THE DIGITAL DIVIDE

A Community Technology Strategy may be seen as an instrument for the co-ordinated development of an ICT capability in a community covering all domains of community life: social, economic, educational, civic, and cultural. As such it is based on a shared vision of the role of ICT in the community, and partnership action to progress that vision.

Development of a Community Technology Strategy has much in common with the overall development of the community as a learning community, and similar stages of development are involved. A Community Technology Strategy could be devised as a project undertaken under the overall Learning Community Strategy. If this approach is taken a task force might be established to carry forward the initiative, reporting to the Steering Committee co-ordinating the overall Learning Community initiative so that links to the broader development are made.

A Community Technology Strategy (CTS) should be comprehensive in its scope so that synergies are created between action taken in various component parts of the strategy, for example between:

- promotion of ICT to families and outcomes at school;
- raising ICT skills in schools and VET and furthering the use of e-commerce and e-learning in business;
- addressing the digital divide and raising the quality of life in the community.

For this reason the strategy should cover educational, social, business, cultural, and civic objectives including:

- ensuring that all students in schools and VET achieve basic ICT skills and a platform of digital literacy;¹⁴
- enabling citizens lacking basic ICT skills to achieve these skills;
- promoting the use of e-commerce and e-learning in business;
- ensuring that ICT is used in innovative and creative ways so as to enrich and broaden the experience of citizens and generally enhance the quality of life in the community;
- using ICT to build the knowledge base of the community;

¹⁴ See Chapter 3.

- promoting the use of ICT so as to foster a culture of learning, innovation and enterprise in the community.

Furthering objectives such as those will require active involvement in the strategy of a range of stakeholders in the community. These include all education sectors, employers and employer organisations, library, community organisations, and ICT specialists.

While a task force comprising these interests may be used to develop the strategy, the strategy may also be linked to the development of a Community Technology Centre as the centrepiece of the strategy, with a range of functions to support the role of ICT in the community. A number of concepts of a Community Technology Centre may be considered for this role. These are discussed in Chapter 6 which follows.

The Development Process

Development of a Community Technology Strategy may be undertaken in the following way.

1. Establish a task force (or similar body) to undertake development of the strategy with all key stakeholders represented.
2. The task force undertakes an audit of the current situation to identify resources, needs and priorities.
3. A draft strategy is drawn up by the task force for community consultations on needs and priorities.
4. Following consultations the agreed strategy is implemented with targets established and progress closely monitored.

Comment follows on these steps.

Establishment of Task Force

As noted above, it is important that all stakeholders are included on the task force including all educational sectors, employers and employer organisations, library, council, community organisations (including welfare, youth, and senior citizens), and ICT specialists.

While the task force might report to the Steering Group directing the Learning Community initiative, options exist for the task force to be convened and serviced by the council or regional development agency (if this exists).

Undertake an Audit of Current Situation and Needs

The audit of the current situation should identify ICT resources in the community, the quality and extent of use, and needs and priorities. Such an audit should be

comprehensive in ranging over all sectors where ICT is used. Questions such as the following should be addressed:

1. In what ways is ICT used in schools and VET?
2. Are there particular barriers to alternative uses?
3. What has been the impact of ICT on the work of schools and VET?
4. In what ways might this impact be deepened or enriched?
5. What groups in the community lack basic ICT skills?
6. Can an estimate be given of the numbers of people without these skills?
7. What resources does the community have to provide basic ICT training for those wanting to acquire these skills?
8. How can the importance of digital literacy best be promoted in the community?
9. How extensively and effectively is e-commerce and e-learning used in the small business sector?
10. Are there particular barriers to greater use of these strategies? How might these be addressed?

The task force might divide into smaller working groups to address the identified questions. It is desirable that a short report on the ICT audit be prepared to provide feedback to the stakeholders involved in the audit.

Consultations on Draft Strategy

Following completion of the ICT audit, the task force will prepare a draft Community Technology Strategy for consultations with stakeholders. It is desirable that the draft strategy cover all the areas and stakeholders discussed above. It should include a vision of ICT in the community, a set of objectives, and strategies to be implemented, along with targets to be achieved. The Community Technology Strategy should be seen as a key component in the broader Learning Community Strategy.

Implementation of the Agreed Strategy

After consultations, the draft strategy will be revised and implemented in accordance with the agreed implementation strategy. This should aim to achieve maximum leverage from synergies between components of the strategy. Aspects such as promotion can be linked to overall promotion of learning in the learning community.

The Role of Community Technology Centre

The option exists to develop a Community Technology Centre as a centrepiece and focal point in the strategy undertaking multiple roles. This option is discussed in Chapter 6 which follows.

The Role of a Community Portal

In addition to a Community Technology Centre, a further key component in the strategy might be development of a community portal, or alignment of an existing portal with the objectives of the strategy.

It is now common for communities to have web sites which provide a range of information for the public. A portal is a web site that acts as a “doorway” to the Internet or portion of the Internet, often targeted towards a particular subject or client group.

A council could decide to develop its web site as a community portal with links to a range of related web sites so that the public can access these web sites through the community portal.

A learning portal for a learning community could be accessed in this way. For example, New Hunter Learning might serve as the learning portal for the New Hunter community with links to all education sectors (including adult and community education), the Community Technology Centre, the Learning Shop (if this exists), and workplace learning resources.

Such a portal would not only provide ready access to information for the community, but would also serve to promote ICT skills and habits as a culture of digital literacy was fostered.

There are many examples of community learning portals around the world which can be visited to see examples of good practice, and to gain ideas relevant to your community. In many cases these are broader community portals in that learning is one of the areas covered by the portal.

Some examples are:

Birmingham Grid for Learning

This is a portal in a British Learning City with a substantial focus on learning and with a range of links.

<http://www.bgfl.org>

Bendigo Learning City

This is an example from an Australian Learning City where the portal is in an early stage of development.

<http://www.learningcitybendigo.com/index.shtml>

Redbricks, Manchester

Redbricks claims to be Manchester's best connected community and has a lively portal with a good deal of local community information presented in an interesting manner.

<http://www.redbricks.org.uk/main.php>

Blacksburg Electronic Village

This is an American community with a lively community portal which provides comprehensive information.

<http://www.bev.net>

Smart Geelong

A further Australian example from Victorian Learning Towns.

<http://www.geelonglearningcity.vic.edu.au/pagel.htm>

La Grange Georgia

La Grange in Georgia (USA) describes itself as the first American city to bridge the digital divide.

<http://www.lagrange-ga.org/homepage.cfm>

East Manchester

East Manchester uses the brand name Eastserve for its portal which provides comprehensive community information in a lively manner. This is one of the best of the community portals.

<http://www.eastserve.com/index.jsp>

Smart Labrador

Smart Labrador is one of the Canadian Smart Communities projects serving isolated communities across Labrador.

http://www.smartcommunities.ic.gc.ca/de/demo_newfoundland_e.as

Virtual Charlottetown, Prince Edward Island

Another Canadian Smart Community project based on the concept of a virtual town square in historic Charlottetown.

<http://www.virtualcharlottetown.com>

Smart Capital, Ottawa

A Smart Community project in the Canadian national capital which has an orientation to accelerating the development of online services for all sectors of Ottawa.

<http://www.smartcapital.ca>

Addressing the Digital Divide

A key objective in a Community Technology Strategy is to address the digital divide in the community and to provide opportunities for all citizens to achieve basic digital literacy.

This involves:

- all members of the community acquiring basic computer and Internet skills;
- a capacity and motivation to apply these skills in a range of learning contexts.

The steps outlined above provide a framework for developing a community strategy for this purpose. This action is summarised in Exhibit 1.

Exhibit 1: Steps in a Community Strategy to Address the Digital Divide in the Community

1. Conduct an audit of the current situation and identify the groups in the adult community lacking digital literacy.
2. Estimate the numbers in these groups.
3. Identify the barriers to their participation
 - Some interviews may be necessary to supplement existing information.
4. Assess the resources in the community which could be used to address the problem
 - This will include both technology and human resources (teachers, mentors, clubs etc.)
5. Determine a strategy to provide opportunities for all citizens to acquire basic digital literacy
 - a. Include a marketing strategy
 - b. Identify roles for all stakeholders and partners eg TAFE, community library, community technology centre, employers, clubs.
 - c. Include targets to be achieved in the period covered by the Community Technology Strategy.
6. Monitor and celebrate progress.
7. Use the community learning portal to promote the program.

Building a strategy to address the digital divide should be a key component in developing a Community Technology Strategy. Key features are likely to be:

- it will involve partnership between all stakeholders
 - education providers, libraries, clubs and societies, employers etc.
- it will have a co-ordinating mechanism and will be strategic in approach.

- it will draw on the total resources of the community (human, facilities, technology) in a co-ordinated way.
- it will have a strategic approach to promotion and marketing.

Promotion

Effective promotion and marketing is one of the keys to a successful strategy. This could include promotion through peer groups (clubs, societies, etc), inclusion in events such as Learning Festivals, promotion through a Learning Shop if this exists in the community, and through the community library.

- The marketing strategy should address the barriers to participation which have been identified in developing the community strategy. These may include failure at school and lack of confidence.
- Some excellent films exist in video and other formats which can be used in providing “soft gateways”. These include BBC films *Computers Don't Bite* and *Netwise*.

Family strategies can be effective in promotion, and can be linked to the role of a Family Learning Centre. Such centres can operate in a community library or school, say on a Saturday morning, and can be used to develop motivation and confidence in a friendly environment. The Community Technology Centre (discussed in Chapter 6 which follows) can serve a similar function through strategies such as Open Days, in some cases linked to Learning Festivals. There is growing evidence that libraries can be effective gateways.

Using all Community Resources

A second prime condition for success is to draw upon the total resources of the community: human, facilities, and technology.

It is usual nowadays for collections of computers to be available in community libraries, TAFE Institutes, schools and other locations. In some communities, these include telecentres and community technology centres. All these resources could be drawn into a Community Technology Strategy to address the digital divide.

While human resources include teachers in adult and community education, TAFE and VET, and schools, there are usually significant other human resources in a community which can be drawn. These include business people, administrators in clubs and societies, people in various professions, and retired people with a range of backgrounds.

The opportunity therefore exists for mentoring schemes in which people from a diverse range of backgrounds would volunteer their services in serving as tutors and mentors for people acquiring basic computer skills.

Organising such schemes would be a key aspect of a Community Technology Strategy.

In some cases it may be feasible for clubs, societies, and organisations to take a lead in organising basic computer courses for their members, perhaps in partnership with a provider such as ACE or TAFE.

A key requirement is to keep such basic courses as low cost or no cost so that financial barriers do not deter participation.

In some cases it may be feasible to secure sponsorship of basic programs for their members or workforce from clubs, societies, and employers as an investment in quality of life and workforce investment.

Monitoring and Celebrating Progress

It is important to monitor and celebrate progress. Monitoring will usually involve statistics on the numbers undertaking programs and follow up on subsequent learning activities. All participating partners (TAFE, library, clubs, ACT) could maintain these statistics for their own programs and pass them to an agreed central point under the Community Technology Strategy. In some cases this may be a Community Technology Centre.

It is desirable for a community to set targets to be achieved in addressing the digital divide in the community. For example, a community might set the target of eliminating the digital divide in the community in a period of five years. La Grange in Georgia (USA) describes itself as the first American city to bridge the digital divide. Other communities in Britain and America have made substantial progress.

Achieving digital literacy for all in a community is often connected with the expansion of computer and Internet connections in the community so that all citizens can access the riches of the Internet, while economic benefits are also achieved. Some communities have set targets in this respect. For example, the Canadian capital Ottawa aims to build the world's most connected community under its Smart Capital initiative. Community technology indexes of various types are becoming increasingly common in countries such as the United States, and often have an influence on locational decisions taken by companies. These could be direct economic benefits for a community, apart from social benefits, in addressing the digital divide and promoting connectivity in the community so that the community acquires the image and reputation as a progressive, 21st century community.

A Community Technology Centre can play a key role in a Community Technology Strategy, and in addressing the digital divide in the community. This role, and organisational options, is discussed in Chapter 6 which follows.

6. THE ROLE OF THE COMMUNITY TECHNOLOGY CENTRE

A Community Technology Centre (CTC) can play a key role in achieving the ICT objectives of a community. Such a Centre can be an instrument for fostering collaboration and partnership between stakeholders in furthering the objectives, as well as undertaking promotional, information, and training roles.

There is a number of ways in which this concept can be implemented, and existing bodies may undertake this role as well as a purpose built facility. Existing organisations such as telecentres, Open Learning Centres, or libraries may undertake this role.

A further option is for the CTC role to be performed by a network of existing bodies, functioning as a consortium, rather than a single institution. Such a consortium might include TAFE and school ICT facilities, library facilities, and a telecentre if this exists.

In this case, the work of the consortium will be co-ordinated by the terms of the agreed Community Technology Strategy. It would also be desirable for an advisory committee to ensure that co-ordinated action occurs between the consortium partners.

An option of interest which is emerging in some innovative projects across Australia is to combine a community technology centre with a new library development. In some cases, new community complexes are combining library, learning centre, and community centre roles in ways that enable synergies to be achieved between these roles.

Some examples are:

- **Lithgow** where a new library complex will combine library, learning centre, and technology centre roles.
- **Portland** where a televillage function is being added to the library.
- **Hume Shire** where a Global Learning Centre will replace its existing library with a mix of library, technology centre, drop-in-centre and other roles.

In some other projects, such as the new Palmerston library in the Northern Territory, the mix of functions has not yet been determined although it is likely that a community technology centre function will figure in planning for these projects.

There are advantages in such comprehensive community facilities where the mix of roles opens learning pathways for the community, and where technology centre roles and functions can be promoted through the community library and strategies such as Family Learning Strategies.

Objectives

A CTC can serve as the centrepiece of a Community Technology Strategy in addressing a broad spectrum of objectives. These may include:

1. Promotion of ICT in the community so as to ensure community understanding of the role of ICT in education, business, and in society.
2. Contributing to progressing the objective of basic ICT skills and digital literacy for all members of the community.
3. Fostering partnership between stakeholders in furthering the ICT objectives of the community.
4. Supporting schools and VET in innovative and creative approaches to the role of ICT in teaching and learning, and generally encouraging pedagogical innovation in the use of ICT.
5. Promotion of e-commerce and e-learning in business, in particular in the small business sector.
6. Provision of advice to small business on e-commerce.

Other objectives can be added to these core functions depending on the priorities of the community. Customisation to meet local needs is a central feature of CTCs so that there is considerable diversity in the objectives and arrangements developed for centres.

Some models

There is no single best model for a CTC, and a range of models exist in Australia and overseas. These often involve different terminology, and terms such as telecentre and open learning centre as well as the generic community technology centre. A community library may serve as a community technology centre, and a number of library projects are currently being planned across Australia as outlined above.

While terminology differs, two broad approaches to developing a CTC exist. These involve:

- (a) a single institution; and
- (b) a network of co-operating institutions.

The single institution model may be termed a telecentre, CTC, or some other name and may either be purpose built or developed from an existing facility. A centre could be hosted by another institution, such as a library or TAFE college.

While the single institution model is the usual approach in small communities where it performs the range of CTC functions, in larger communities CTC functions may be performed by a network of collaborating institutions within the

framework of a Community Technology Strategy. Such a network might comprise one or more libraries, TAFE and school facilities, and other resources.

In this case, the network will collaborate through agreed partnership arrangements in progressing the objectives of the Community Technology Strategy. This might include, for example, addressing the digital divide with co-operation between the partners in the network in providing basic computer and Internet training for the community. In this case promotion would also be co-ordinated so that the community is aware of the range of opportunities available.

These models are evolving in the context of emerging learning community initiatives in Australia and are likely to become increasingly sophisticated in the future in mature learning communities. Current innovations, for example, in the roles of libraries in learning communities will enhance opportunities available for communities. A few current initiatives combine new libraries with community technology centres in creative mixes of roles.

Current Australian and International Developments

There are considerable current initiatives in Australia and overseas in developing CTC roles. In Australia a boost to this role was provided by Commonwealth funding made available under the Networking the Nation Program which enabled more telecentres to be established across Australia. Some State initiatives are discussed below.

New South Wales Community Technology Centres

New South Wales has an active Community Technology Centre (CTC) program and aims to establish more than 60 new CTCs in the period 2001-2004. These Centres are seen as local technology sites for local businesses, students, community organisations, individuals and groups. They therefore serve a range of purposes in supporting these stakeholders.

The NSW approach is guided by five community-based principles. These are: partnership, strategic relationships, equity, commitment, and leadership. Support and co-ordination services are provided through twelve regions that the State is divided into. There is a business orientation and Business Development Officer advising Centres in achieving business opportunities.

Support materials for Centres include a range of Toolkits covering planning, managing, and operating a CTC. Strategies are in place to foster cross-fertilisation of experience between Centres.

Comprehensive information on NSW Centres can be obtained from the program web site. <http://www.ctc.nsw.gov.au>

Western Australian Telecentres Network

Western Australia has a well established network of Telecentres across the State. These are community-owned, managed and incorporated with 93 Telecentres planned to increase to 100 by mid 2002.

Typical Telecentres provide computers, Internet access, two-way 128Kb videoconferencing, fax, printers, and copiers, scanners, and other equipment. It is planned to install two-way videoconferencing in all Telecentres by the end of 2003. All Telecentres have satellite receiver dishes which enable them to participate in conferences on a state, national, or international basis through the State's Westlink satellite service.

Information on Western Australian Telecentres may be found on the program web site. <http://www.telecentres.wa.gov.au>

Queensland Open Learning Network (now Learning Network Queensland)

The Queensland Open Learning Network has comparable functions to the New South Wales and Western Australian models. The network of over 50 centres across Queensland has operated since 1989 and built up substantial experience and expertise over that period.

The Network provides a comprehensive range of services including:

- provision of support services for students undertaking distance education programs;
- delivery of education and training programs including
 - program design and development
 - delivery and support;
- provision of careers advice and information;
- advocacy roles on behalf of many organisations;
- undertaking special projects such as the Tablelands Online project designed to help rural communities develop knowledge and skills in ICT.

The functions of the Network have diversified as the Network has evolved since 1989. Functions are undertaken in partnership with a number of organisations and institutions with strategic alliances. Local communities are seen as partners of the Network and are required to provide accommodation for centres.

<http://www.lnq.net.au>

Other States

Other states have comparable systems of local community technology centres. An example is Tasmanian Communities Online.

<http://www.tco.asn.au>

United States Community Technology Centres

The United States has active Community Technology Centre development which has been stimulated by:

- the existence of a Community Technology Centers' Network (CTCNet) comprising 700 independent community technology centres across America; and
- a Community Technology Center Program funded by the US Department of Education which tests innovative approaches through pilot projects.

CTC Net

CTC Net provides comprehensive information and materials for its member centres. These include publications and manuals (such as a CTC Center Start-up Manual, a CTC Toolkit and CTC Net Strategic Planning Guide), and news on current developments. These materials can be downloaded from the CTC Net web site.

THE CTC Net web site is a useful web site for information on current trends and innovations. A strength of the American approach is the financial support that is often provided by foundations to bolster particular services and innovations. As with many American innovations, diversity is a central feature of American CTSS.

<http://www.ctcnet.org>

US Government CTC Program

The CTC Program administered by the US Department of Education is designed to promote the development of model programs that demonstrate the educational effectiveness of technology in urban and rural areas and economically distressed communities. The equity objective of access for all is central in this program.

An **America Connects Consortium** has been established to provide technical assistance and other services for CTCs. A range of organisations are members of the Consortium and support its objectives. These include the National Alliance of Business and the Information Technology Association of America. Information on the Consortium is available from its web site.

<http://www.americconnects.net>

The web site for the United States CTC program provides profiles of funded CTC projects and access to a e-newsletter titled *C-Tech Talk* which provides news on current developments.

<http://www.ed.gov/offices/ovae/ctc>

British Developments

There has been an active development of local CTCs in Britain linked to Government equity objectives, and the aspiration to modernise Britain as a progressive and inclusive learning society. A number of programs are involved including:

- UK Online Centres
- Learndirect Centres
- Wired Cities

UK Online Centres

These are being developed as a national network of local access centres with 6,000 centres to be in operation by 2005. All government services are planned to be online by 2005 so that the local centres will provide access to a comprehensive range of government services and information.

Centres are being established in a diverse range of locations with many existing facilities achieving recognition as a UK Online Centre. Preliminary research studies have shown that the centres have been successful in assisting target groups to acquire basic ICT skills and to develop motivation for learning.

<http://www.dfes.gov.uk/ukonlinecentres>

Learndirect Centres

A national network of Learndirect Centres has also been established to provide local access to the programs of the University for Industry (Ufi). Ufi was established by the British Government to foster new approaches to learning in the Information Age. Ufi has two central aims:

- to stimulate demand for lifelong learning among business and individuals; and
- to promote the availability of, and improve access to, high quality and innovative learning in particular through the use of information and communication technologies.

The network of some 1,000 Learndirect centres play a key role in widening access to learning through the courses provided online by Learndirect. Ufi and Learndirect is a significant innovation in widening access to learning through innovative strategies, and the outcomes could hold lessons for Australia.

<http://www.ufild.co.uk>

Review of key ideas

- A local CTC can serve as the hub and main driver of a Community Technology Strategy.
- A CTC can serve a range of social, educational, cultural, and economic objectives.
- Widening opportunities for all members of the community to achieve basic ICT skills and digital literacy is a core objective.
- Business support objectives can also be built in.
- The CTC should be supported by partnership arrangements involving all key stakeholders.
- A centre may function as either a single institution or a network of collaborating institutions within the framework of the Community Technology Strategy.
- Community libraries can perform this role.
- Emerging innovations include models which link library, technology centre, and learning centre functions.
- Much is to be gained from international experience from the web sites listed above.

For discussion

1. What kind of CTC would best suit your community?
2. What existing resources might be incorporated?
3. Who are the stakeholders that should be partners in a CTC development?
4. What technologies should be available in your CTC?
5. In what ways can your CTC be a hub to promote and support ICT development in all sections of your community?

7. TRANSFORMING LEARNING WITH TECHNOLOGY

Information and communication technology has the potential to be a major instrument to transform the way we learn in the context of the emerging information and knowledge society, and to serve as a tool of lifelong learning throughout society.

As yet, the enormous potential of ICT as an instrument for providing lifelong learning opportunities for all has not been realised, and there is considerable concern across OECD countries to identifying the barriers, and to address them in a strategic way.¹⁵ A learning community initiative provides an ideal framework to bring stakeholders together to plan local strategies that address the barriers, and to initiate partnership action to address the barriers.

While substantial barriers remain, there are significant innovations across Australia, and overseas, which point the way to the future and to achieving the full potential of ICT as an instrument for lifelong learning for all in a learning society. These innovations include projects to redefine the library role as a community learning centre, in some cases in facilities which combine library, learning centre, and community technology centre roles. Some examples are given below.

The impact of ICT in a community throws up a broad spectrum of issues which need to be addressed as a community progresses and matures as a successful and inclusive learning community. For this reason, it is highly desirable to build action learning and action research strategies into the learning community strategy so that new knowledge is generated through the implementation process on ways to transform the ways we learn in an Information Society. GLS Learning Guide No 3 may be consulted on action learning.

Issues to be addressed by a community in this on-going process of action learning and research include the following:

1. In what ways can ICT be used to motivate students and citizens alike to develop as self-directed lifelong learners?
2. What roles can schools, VET, libraries, and employers have in this process?
3. How best can digital literacy for all be ensured?
4. In what ways can workplace learning be connected to learning in other contexts so as to strengthen its impact?
5. What role might a family learning strategy play in this process?

¹⁵ See Kearns P 2002, Towards the Connected Learning Society: An International Overview of Policy for Information and Communication Technology in Education, Department of Education, Science and Training, Canberra.

6. In what ways might creativity, innovation, and enterprise be fostered in the community through strategies which link learning and ICT?

Learning in an ICT rich environment takes on new possibilities in developing learning strategies that build motivation for lifelong learning through experiences that learners gain in the joy of exploration, discovery and learning.

On-going advances in technology are opening up new ways of combining educational content delivered through a range of media. There is no doubt that the school of the future will have access to a rich bank of educational resources delivered through ICT.

In this environment it is important that:

- pedagogical innovation should accompany applications of ICT in innovative learning strategies;
- new ideas are spread through learning networks as communities of practice;
- ICT should be used in ways that promote the development of key generic skills required for lifelong learning in a rapidly changing environment;
- these strategies should foster creativity and a capacity for innovation throughout the community.

These objectives should be built into a community technology strategies so that there is collaboration and partnership between all stakeholders in the community in working towards this achievement. Good practice examples of education/industry partnership in the educational role of ICT have been given throughout this Guide, such as the Apple/Singapore Government partnership in the EduQuest program.

Emerging Roles of the Library

The shifts in roles that are occurring in the context of the Information Society may be illustrated by emerging innovations in the role of community libraries in supporting lifelong learning. In some cases, planning of new libraries to support lifelong learning is combining library/learning centre/and community technology centre roles in new complexes.

Some examples are:

- **Lithgow:** Lithgow City Council is planning for a new library complex which will combine library, learning centre, and community technology centre roles.

- **Palmerston:** This Northern Territory initiative of Palmerston City Council involves planning for a new library which will serve as a hub of lifelong learning in the community.
- **Portland:** The library will be combined with a televillage development.
- **City of Melbourne:** A joint venture will combine a new library with an adult education centre.
- **Hume Shire:** The library will be replaced by a *Global Learning Centre* which combines ICT, library, drop in centre, and learning centre roles.

Because ICT is a dynamic force with a rapid pace of change, communities need to be alert to emerging opportunities for innovation in advancing the strategic objectives of the community. This “observatory” role can be performed by a Community Technology Centre.

Effective partnership is critical in building a Community Technology Strategy, and in achieving the many benefits that technology can bring if wisely harnessed. E-learning has been aptly termed by OECD as “the partnership challenge”, and the nub of the technology challenge for communities resides in building effective partnerships for joint action in furthering the objectives of the community.

Building an effective Community Technology Strategy in a community should also be seen as a learning process so that there is effective interaction between action and learning. For this reason, the process should be reflective with opportunities for feedback and reflection built into the strategy.

In this way, when seen as action learning, new knowledge will be generated by the development and implementation process which will add value to the strategy.

Above all it will be necessary to put a human face on technology, so that information and communication technology is seen as a tool for furthering key social, educational, economic, cultural, and civic objectives of the community. For this reason, a Community Technology Strategy is likely to be most effective when it is closely integrated with lifelong learning objectives, and with the strategic development of the community as a learning community.

Seen in this way, ICT will transform the way we learn, and will be a key instrument for building communities which are inclusive, creative, and successful in the challenging context of the Information Society.

Select Glossary of Key Terms

Action learning	Deliberate, conscious effort to review and reflect upon action of the individual, a team, or the organisation. This is often undertaken in teams or sets.
Asynchronous education & training	Education and training using technology where interaction between teachers and students takes place intermittently, not simultaneous, through technologies such as email, news, or discussion groups.
Bandwidth	Information carrying capacity of a communication channel.
B2B e-commerce	This is e-commerce which is typically concerned with transforming the back office functions of firms to make them more efficient so that there may be impacts along the entire value chain of an industry.
Blended e-learning	An approach that combines e-learning with other learning strategies such as face-to-face teaching and action learning in blended configurations.
Chat	Communication between members of an online network using text. The messages are sent between members in real time by typing in short statements.
Community of practice	A learning network whose members share ideas and experience and learn together. This may be facilitated by technologies such as email.
Digital	An electronic signal that varies in discrete steps in voltage, frequency, amplitude, locations, and so forth. Digital signals can be transmitted faster and more accurately than analogue signals.
Digital divide	This is a term used to describe the social implications of unequal access by some sectors of the community to information and communication technology and to the acquisition of the necessary skills.
Digital learning	The educational approach that integrates technology, connectivity, content, and human resources to create productive and engaging learning environments.

Digital literacy	The acquisition of basic ICT skills, including the ability to use computers and the Internet, as well as a broader capacity to use ICT for educational, social, and economic purposes which involve reasoning, problem solving, and other key skills.
e-commerce	Every type of business transaction or interaction in which the participants prepare or conduct business electronically.
e-learning	This term covers a wide range of technology-based applications and processes such as web-based learning, computer-based learning, virtual classrooms, and digital collaboration. It includes the delivery of content via the internet, intranet/extranet (LAN/WAN), audio and videotape, satellite broadcast, interactive TV, and CD-ROM.
ICT	Information and communication technology.
Informal learning	Incidental and tacit learning that occurs in many social, organisational, and community contexts.
Knowledge management	Capturing, organising, and storing knowledge and experience of individual workers and groups within an organisation and making it available to others in the organisation.
LAN	Local Area Network. A group of computers and other devices, such as printers, or servers, that are located in a relatively limited area, such as an office or school, and can communicate and share information with each other.
Learning community	Any group of people, whether linked by geography or by some shared interest, which addresses the learning needs of its members through proactive partnerships and shared ideas and experience.
Learning portal	Any website that offers learners or organisations access to learning and training resources from multiple sources. EdNA Online, Ferl, and the National Grid for Learning provide examples.

Lifelong learning	All learning activity undertaken throughout life, with the aim of improving knowledge, skills, and competencies, and enhancing quality of life and personal fulfilment, within a personal, civic, social and/or employment-related perspective.
Managed learning environment	A managed learning environment (MLE) describes the electronic management of learning processes to support teaching and learning. The MLE concept is often seen as similar to a virtual learning environment.
Multimedia	Encompasses interactive text, images, sound, and colour. Multimedia can be anything from a simple Powerpoint presentation to a complex interactive simulation.
Portal	A website that acts as a “doorway” to the Internet or portion of the Internet, often targeted towards one particular subject or client group.
Situated learning	Knowledge and skills are learned in contexts that reflect how knowledge is obtained and applied in everyday situations; situated learning theory conceives of learning as a socio-cultural phenomenon rather than the action of an individual acquiring general information from a decontextualised body of knowledge.
Synchronous learning	A real-time, teacher or tutor-led on-line learning event in which all participants are logged on at the same time and communicate directly with each other.
Visual literacy	This describes effective interpretation and production of visual imagery including the ability to translate thinking and creativity into effective presentations, manipulate a variety of media including video, and appreciate aesthetic values.
WAN	Wide Area Network. A computer network that spans a relatively large area. This is usually made up of two or more local area networks.

List of Useful Web Sites

Useful web sites are given throughout the chapters of this Guide. For convenience in reference, a select list of useful web sites is set out below.

Information Society

NOIE (National Office of the Information Economy)	http://www.noie.gov.au
e Europe Action Plan (European Union)	http://www.europa.eu.int/information_society/index_en.htm
Australian Strategic Framework for the Information Economy	http://www.noie.gov.au

Education Policy & Programs for ICT

Learning for the Knowledge Society (ICT Action Plan)	http://www.dest.gov.au
Policy for ICT in Education Data Base	http://www.ictpolicy.edna.edu.au
EnNA Online portal ¹⁶	http://www.edna.edu.au
Flexible Learning Advisory Group (FLAG) ¹⁷	http://www.flexiblelearning.net.au
European Union e-learning Action Plan	http://www.europa.eu.int/comm/elearning.en.htm
European SchoolNet	http://www.eun.org
Canadian SchoolNet	http://www.schoolnet.ca
Canadian SchoolNet Grassroots Program	http://www.schoolnet.ca/grassroots
Grid Club ¹⁸	http://www.gridclub.com

¹⁶ EnNA provides links to all State Education Systems.

¹⁷ VET sector national flexible learning strategy (Australian Flexible Learning Framework).

¹⁸ Grid Club claims to be Europe's largest source of online educational resources for students, parents and teachers.

Wired Communities

Canadian Smart Communities <http://www.smartcommunities.ic.gc.ca>
British Wired Cities <http://www.dfes.gov.uk/wired/links.shtml>

Learning Communities

ANTA National Learning Community Project (Learning Audits Reports) <http://www.anta.gov.au>
Victorian Learning Towns <http://www.acfe.vic.gov.au/LearningTowns>
Bendigo Learning City <http://www.learningcitybendigo.com/index.shtm>
Ballarat Learning City <http://www.ballaratlearningcity.com.au>
British Learning City Network <http://www.lifelonglearning.co.uk/learningcities>
Glasgow Learning City <http://www.glasgow.learning.net>
European Area of Lifelong Learning <http://www.europa.eu.int/comm/education/life/>

Digital Divide

NOIE <http://www.noie.gov.ua>
Benton Foundation <http://www.benton.org>
Digital Divide Network <http://www.digitaldividenetwork.org/content/>
UK Online Centres <http://www.dfes.gov.uk/ukonlinecentres>
Canadian Community Access Program <http://www.connect.gc.ca/en/zcp.ehtm>

Community Technology Centres

US Community Technology Centres <http://www.ed.gov/offices/OVAE/CTC>
NSW Community Technology Centres <http://www.ctc.nsw.gov.au>
WA Telecentres <http://www.telecentres.wa.gov.au>
CTCNet (USA) <http://www.ctcnet.org>
Learning Network Queensland <http://www.lnq.net.au>