E-Learning's Role in Bridging the Digital Divide in the APEC Region

Dr Andrew Higgins

HEDC, University of Otago

PO Box 56, Dunedin NZ

ABSTRACT

The paper offers a model showing the relationships existing between the lifelong learning agenda, the knowledge economy and marginalised communities. Experiences reported from the Asia Pacific region will be addressed. The paper identifies different kinds of marginalisation and demonstrates how e-education can be used to enhance access to learning. The model also indicates that social, political, financial and pedagogical issues need to be considered when developing incentives to engage in e-education for lifelong learning.

Introduction

The social justice agenda in the western world operates within the context of equity, access and participation in the life of a society. (Ministry of Education, New Zealand (2002). Equity is often taken to mean equal treatment for all, access means giving everyone an opportunity to engage in the life of a community and participation expresses itself as inclusion in the community. These may well be key elements of lifelong learning. Inglis, Ling and Joosten (2002 p. 28) raise the issue of cost-effectiveness of the different modes of educational delivery for social purposes, the quality of education and training and, access and equity. Similarly, Bates (Lockwood 1995) identifies access and equity as key social issues. These essential principles are supported by three others, namely, authority, accountability and responsibility. The implications of the social justice agenda are significant, not only in the provision of education, but also for its efficient and effective administration. In particular, the delivery of education in the post-compulsory sector, including lifelong learning, is tending towards distance and electronic delivery strategies (Perraton, 2000). The social justice agenda implies that all of a nation's citizens have the right to an education that the education should be accessible to the people and that none should be excluded from it. This includes those citizens on both sides of the digital economic divide. What can e-education contribute and how can any necessary changes be brought about? Clearly, if democratic government is to play a role, it arises from having the responsibility for the welfare of its citizens, having authority to make decisions and being held accountable for its stewardship of the welfare of the community. In this paper, the term e-education is taken to include strategies for teaching, learning and delivery. It involves e-teaching and e-learning along with various strategic and administrative resources needed to support teaching in an internet environment. (Ministry of Education, NZ, 2002 p. 7). E-learning is more strictly focussed on the

students' learning activity and outcomes (Mason 1998, p.38). E-learning takes place in the context of using the internet and associated web-based applications as the delivery medium for the learning experience. (Ministry of Education, NZ, 2002 p. 7) Some nations have been successful in acquiring the technology infrastructure required to bridge the digital divide while others are now enacting policies and practices to foster the necessary changes. The development of national e-learning strategies in Canada and New Zealand are cases in point.Theoretical IssuesLatchem and Hanna (2001, p.15) argue that 'It is predicted that, if traditional institutions fail to heed the imperatives for change, they may leave the field open to new borderless providers…whenever there is rapid change and uncertainty in the external environment and existing institutions are unprepared to respond quickly and effectively, new organisations will emerge and seize advantage.' The rate at which some educational providers are taking up e-learning indicates their recognition of this issue. Changes of the last 50 years in economic and industrial practices resulted in a low demand for unskilled labour and subsequent pockets of urban unemployment. Strong agricultural competition and globalisation accelerated rural depopulation. It is part of the "access" agenda that groups affected by the global economic changes should be included and retained in the life of the nation. These people are at the core of lifelong learning. Providing accessible education for retraining and upskilling of marginalised populations is one way of meeting social justice goals. However, today it neither feasible nor acceptable to construct high cost buildings in which to conduct retraining. Inglis (2002, p. 56-8) and Rumble (1997) analysed these costs in depth to demonstrate that movement away from classroom delivery enhances cost-recovery arising from economies of scale. Consequently, some governments look to e-education as a strategy for educational provision, especially in the area of lifelong learning provision. Industry, business and government may no longer be able to justify the use of costly "off-the job" training programmes with the frequency they are needed. Some large companies provide their employees with "on-the-job" retraining and upskilling through electronic means in the belief that training costs are lower and knowledge uptake is faster. Mason (1998 p.27) reports that Mercedes Benz trains 20 times more employees than it did before by using electronic media. Similar cases are found in Latchem & Hanna (2001), Farrell (1999), (Mason 1998). Allied to the concerns about the economically marginalised peoples' needs and industry's requirements for upskilling the workforce is the demand for lifelong learning. It manifests itself both in the professions and among the retired, for example, in the University of the Third Age. Professionals need to ensure they are abreast of developments in their work if for no other reason than that of risk management. Retired people, retiring earlier and living longer than ever before, use learning as a means of ongoing personal development. Some people are often unwilling or unable to leave either place of work or homes and so they create a demand for electronic delivery of education directly to themselves. The characteristics of these groups are sufficiently different that each needs educational provision suited to itself; hence it is appropriate to focus more closely on those who might benefit from e-education. For example, the new paradigm for higher education suggests that 'educational institutions need to be more responsive and flexible in their dealings within the environment and their clients. (Inglis, 2002, pps 22-23).

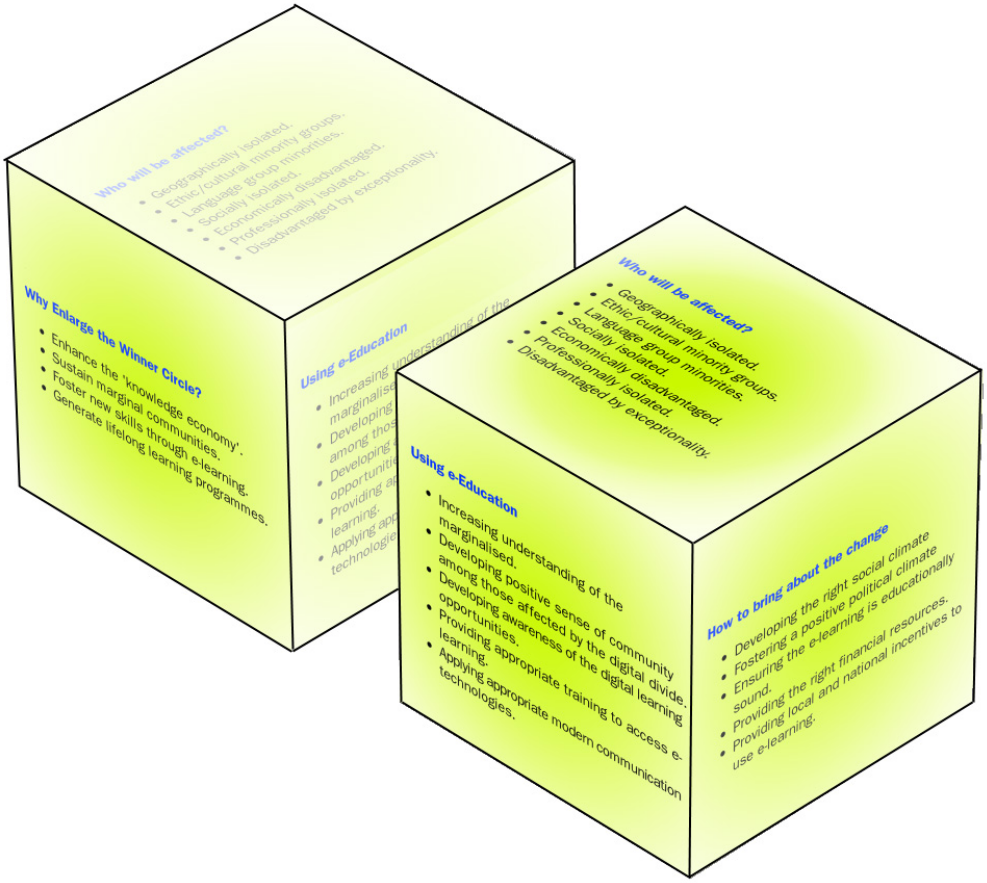

Fig 1. Diagram showing the inter-relationships of factors that affect e-education

Who will be most affected?

Darnell and Higgins (1983) proposed a three-dimensional model for addressing the inter-relatedness of factors that impinge on education in isolated places. Although designed for an analysis of educational provision in rural settings, it is useful in the context of e-education, lifelong learning and the digital divide because some of the same elements apply and because this model shows how the elements interact with each other. The inter-relationship is seen when elements of any one face are associated with those on the other faces, for example, recognising those disadvantaged by exceptionality might require developing and understanding of their circumstances which may result in developing and delivering pedagogically sound education for delivery to those so identified. Other elements can be similarly construed. The section on 'Enlarging the winner's circle' is concerned with APEC's view of possible international strategies designed to enhance member peoples' economic and educational opportunities. The following section expands on some of these strategies.

Distance educators originally concerned themselves with geographically isolated students, those who lived too far away from an educational institution to be able to attend

it. Governments in Australia and New Zealand created Correspondence Schools that used the mail system to educate pre-school, primary and secondary-aged students. Tertiary institutions created Departments of External Studies or Extramural Units to cater for those who could not attend the institution, for example Massey University in New Zealand. Today, distance education is delivered by a variety of means including print, radio, television, CD ROM, the internet and e-learning at all levels of the education system. These means converge in the e-education environment. Mason (1998) discusses media for delivering global education and points out the various advantages and disadvantages of appropriate media. In the lifelong learning context this means that the media have to be selected to suit the end-users rather than the educational providers, and goes beyond the correspondence model. Students are not isolated by virtue of distance alone but sometimes because they belong to a culture outside the mainstream. E-education can be developed to take account of cultural difference. Many nations have groups within their boundaries whose language is not the dominant one. Sometimes the language is not a written one and is not amenable to transfer in printed form, for example, some Aboriginal languages. E-education strategies may need to account for these kinds of issues in order to accord with the principle of participation through lifelong learning. Socially isolated people exist within any community. Among these might be women at home with small children in the western suburban environment without an extended family for support. Immigrants may also be counted in this category. For those who are unable to leave their homes, perhaps because of some disability, e-education has the potential to alleviate the social isolation by its capacity to bring a wide learning environment into the home. The economically disadvantaged, including those with unstable or inadequate incomes, or who rely on fixed incomes that diminish over time, may be served by e-education regardless of location. However, e-education in the personalised western form requires ownership of expensive computing hardware and access to telecommunications systems. Perhaps the only source of access is through either public provision through community arrangements or by corporate sponsorship? Bates in Lockwood (1995) discusses this concept in detail. Perraton (2000) explores the development of distance learning in developing countries. Professionals working in remote or rural communities may also experience isolation from other colleagues to whom they might turn for professional support or advice. E-education provides this group of people with a means to create and sustain support systems or to upgrade their knowledge and skills by communicating with their colleagues elsewhere in the world. One group of clients capable of being served by e-education are those whose needs arise from exceptionality, including gifted students and those with physical handicaps or learning difficulties. Each group can benefit educationally through the development and delivery of specialised learning packages. Location need not be a factor when providing service to these students. As the discussion above demonstrates, the concept of isolation is more than the geographic; it includes several other factors where client groups would be well served by e-education strategies.

Using E-Education

The provision of education to parties across the digital divide is not only a matter of ensuring that technological equipment is made available to groups and individuals in identified communities. Having the technological wherewithal is a necessity but it is not sufficient to ensure it will be adopted and used effectively. In order to ensure that

technological innovations, of which e-learning is an example, are diffused and adopted, it is necessary for those involved in projects to have an understanding of the client group who will be using the technologies so that implementation issues are socially and educationally acceptable. As Latchem and Hanna (2001, p.16) claim, 'There is a need for educational institutions to radically overhaul the way they relate to their customers'. The purpose of the overhaul is to move the teaching and learning nexus towards the student-centred end of the spectrum, as opposed to the teacher-centred end Timely and effective communications with intended users enhances their awareness of the benefits e-education systems can bring. Once potential lifelong learners are aware of what can be achieved by e-education, then accessible and affordable training has to be provided. Training involves the development and delivery of self-help packages and well as face-to-face contact, with its attendant seminars and itinerancy visits (Inglis 2002:105). Underpinning the e-education strategies is the assumption that the infrastructural backbone of communications technologies such as cabling, satellite links and bandwidth is available to users. Inglis (2002, p. 87) examines a number of alternative methods of technological restructuring to implement e-learning, where substantial investment in ICT infrastructure is required. Many low-socioeconomic urban places may be well served with fibre optic cables while wealthier rural towns may still rely on copper wires for telecommunications. E-education strategic planners need to take into account these structural issues when designing flexibly delivered teaching and learning packages. Perraton (2000), on the other hand, indicates a low success rate for distance learning in developing countries with inadequate infrastructure.

Methodology

In recognising that the 'Digital Divide' is an important social and technological construct, APEC (Asia-Pacific Economic Co-operation) decided that it would host a forum from 24-27 July 2001 in which three elements involving technology across the region would be discussed. They were: e-Business, (the conduct of commerce using the internet) e-Government (the conduct of government using the internet) and e-Learning (as defined above). Each is dependent on the application of Internet protocols to function. Each has been adopted by member countries to the extent that national economies and infrastructure allow. The adoption of technology appears, prima facie, to be the common element. APEC organisers decided to invite Non-Government Organisations (NGOs) representatives to report on each of the three areas and to present national economy reports concerning these strategies. Some NGO participants included;GrowZone Development Network (Australia), TEDI, (Japan), National Farmers Federation of New Zealand) The NGOs provided examples of the use of the e-strategies in their particular areas of interest and made themselves available for discussion with delegates. The following information is derived from the reports given by NGO representatives to APEC. References are made to the actual documents as coded by APEC. An emerging theme from the reports indicated that, although technology was an essential element, attitudes towards its use influenced the extent to which business, government and education acquired, stored and accessed information.

Experiences of selected APEC partners in Bridging the Digital Divide.

Singapore

In April 1997 the Singapore Ministry of Education launched a "Masterplan" for information technology in education to equip every school with hardware and expertise for e-learning over six years (Chua, 2001). The Singapore government recognised that school children were the future e-citizens and put its efforts in the school sector. It also recognised that adults would stand on 'the other side' of the digital divide unless they could be ferried across to the side where the info-society lives. It is intended to have one computer for every two children in school with one-third of curriculum time involved in IT and e-learning. On the adult side, it is the Singapore Government's intention to have 70% of adults making use of information communications technology by 2002. (Chua, 2001). Industry is involved in this process not only on the supply side but also generating a PC re-use scheme for the private sector and members of the public, bundled with free Internet access and e-learning courses.

Thailand

The national Education Act of 1999, Thailand's first, forms the core of an education reform movement. An accompanying national Information Technology policy (IT 2000) set a target of one PC for every 40 secondary school students and one per 80 primary students. The policy anticipates Internet connections to every school, college and University (Durongkaveroj, 2001). Durongkaveroj identifies the main issues affecting the development of e-education in bridging the digital divide. First, an inadequate telecommunications infrastructure where accessibility and affordability are issues, especially in the rural areas. There are also insufficient radio frequencies for use in distance education. Network systems are piecemeal and some are redundant. Second, there is limited curriculum content involving the use of information technologies for on and off line learning. Third, there is a lack of qualified graduates in teaching and technology and fourth, investment levels are low. Thailand's strategies to manage these issues involve adopting a value added policy, an equity policy and a 'quantum jump' policy aiming to double the number of computers and connections between 2000 to 2006. In terms of Lifelong Learning, it is an objective to retrain the existing workforce by using e-learning strategies. Thailand estimates its number of high school graduates will rise from about 800,000 to 1.7 million by 2006, but participation rates are not even over the country. There is a teledensity 43 telephone lines per 100 inhabitants in Bangkok but only 6 per 100 in rural areas. Put simply, in 2001 it remains difficult to ensure that each rural village has a telephone line and until that number is increased, it will be almost impossible to deliver lifelong learning by IT means to rural and remote areas.

Malaysia

In seeking to enhance learning through technological means, the Malaysian Ministry of Education adopted a smart schools project (Razali, 2001). Its aim is to enhance IT literacy, introduce self-paced learning and assessment as well as to foster students using global resources. Through this project parents have direct access to schools, increase their involvement in schooling and have direct access to school records and learning materials. The Smart Schools Project involves reinventing curriculum delivery processes as well as teaching strategies. Acquiring hardware and software requires creating partnerships between schools and businesses. The pilot project involves 90 schools (69 secondary, 21 primary). These schools are largely in urbanised areas. This pilot

development will, if successful, enhance lifelong learning potential among school students and it will engage parents actively in the learning community.

Taiwan (Chinese Taipei)

Chinese Taipei responded to the issue of the new economy by acting on the following strategies (Tang, 2001). They include: investing in education and training especially in scientific and technology research; creating an open and flexible regulatory framework; establishing cyber learning spaces and the promotion of distance education to internationalise and modernise the provision of education. By March 2000, 82% of Taipei's households owned a computer (Ying-Jeou, 2001). The district of Taipei, including Taipei City, invested large amounts of capital in e-learning for its whole community to bring together e-government, e-business and e-learning. An example from a rural primary school in a declining rural mining town (Rui-Gan) outside the city of Taipei provides an example of the success of this strategy. The city provided each classroom in the school with a modern computer, software and wired the school to the Internet. A separate room containing modern computers is available for parents to use after school. The school library is also on-line. Parts of the school curriculum is thematically based and students at all levels are expected to participate as they would in a normal class and also search worldwide for information related to the various themes, for example, on frogs. The digital divide is easily bridged both between the rural areas and the city and the rural places themselves. Parents are heavily involved in the work of the school through the curriculum integration projects and by accessing the web at school for business and other uses. This access fosters their lifelong learning since they can use the web to conduct business, contact others and engage in a lifelong learning experience.

The United States of America

The USA promotes affordable access through a pro-competitive telecommunications information market place and it assists in providing connectivity for segments of society falling behind or at risk (Menes, 2001). A variety of Presidential directives have been issued including a telecommunication services "e-rate" discount for classrooms, libraries and rural health providers, a project for bringing telecommunications to native Americans, a Technology Opportunities Programme, a Rural utilities Service Telecommunications Programme, Neighborhood Network Initiatives, a community Technology Centre programme and a Toolkit for Bridging the Digital Divide (http://www.ed.gov/Technology/tool_kit.html). Also, there are Economic Development administration grants and Minority Business Development Agency grants. At the Federal level, an E-government initiative aims to bring government information and service access online. More details than be incorporated into this paper are accessible at the above site.

New Zealand

In 2001 New Zealand established the ministerial E-Learning Advisory Group that aims to: identify existing e-learning infrastructure and capability; advise on how existing e-learning infrastructure and capability can be used to develop the e-learning capability of the tertiary education sector as a whole; recommend steps that can be taken to secure co-operation, collaboration and the sharing of resources; identify barriers to developing further e-learning capability and means to address these barriers; explore mechanisms for

ensuring, the ongoing co-ordination of e-learning capability and enabling the sector to respond effectively to future learning needs; evaluate good practice in flexible teaching and learning; recommend incentives for capability and staff development; advise-on how best to link with existing commercial expertise; advise on processes that allow for the identification, monitoring and management of risks that may emerge with developing e-learning, capability; advise on how e-learning, can contribute to the export education industry; and develop frameworks for quality assurance and intellectual property rights management in line with international developments. Concurrent with this proposal, the New Zealand Government established and implemented an Information and Communications Technology Strategy for all schools.

Summary

The Digital Divide clearly exists in the APEC region. The rich nations are divided from the poor, wealthy people are divided from those less well off. Rural and urban people are divided across the APEC region. Information is now a currency of the wealthy. The principles of access to learning, equitable treatment of a nation's people and participation in the life of the economy are all at risk for those who sit on the disadvantaged side of the digital divide. Their lifelong learning in the future is dependent, in part, on educators' abilities to devise multiple modes of teaching and service delivery, some of which requires investment in infrastructure development and commitment to human resource enhancement. Technology is becoming a tool for social, economic and educational ends, all of which are inter-linked in the sense that e-Government and e-Business depended on having an e-literate population which will be the product of national e-learning strategies.

References

Chua, J (2001). Utilising e-learning to Bridge the Digital Divide: Public/Private Partnerships in Education. Taiwan. APEC. Edu 01-06.

Darnell, F. and Higgins, A.H., (1983). Factors and Issues in Australian Rural Education: A Case for New Perspectives, in Browne, R.K. and Foster, L.E. *Sociology of Education* (3rd ed), Melbourne. MacMillan.

Durongkaweroj, P. (2001). E-education Strategies in Thailand. Taiwan. APEC. Edu 05-1-06.

Farrell, G. (ed) (1999). *The Development of Virtual Education: A Global Perspective.* The Commonwealth of Learning. (http://www.col.org/virtualed, current to 3 April 2002)

Higgins, A.H. (2001) Bridging the Digital Divide: A New Zealand Perspective. Taiwan. APEC. Edu 06 01-09.

Inglis, A. Ling, P and Joosten, V. (2002). *Delivering Digitally: Managing the Transition to the Knowledge Media.* London. Kogan Page

Latchem, C. and Hanna, D.E (2001). *Leadership for 21st Century Learning*. London. Kogan Page.

Lin, W. and Chen, P.J. (2001). A Close Dance Between Mr Computer and Miss Butterfly. Taiwan. APEC. Edu 10 01-05.

Lockwood, F. (1995). *Open and Distance Learning Today*. London. Routledge.

Mason. R. (1998). *Globalising Education*. London. Routledge.

Menes, J. (2001). Economy Report: Response of the USA to APEC Request for Information on Policies To Reduce the Digital Divide. Taiwan. APEC. Economy Report.

Ministry of Education (New Zealand) (2002). Highways and Pathways: Exploring New Zealand's E-Learning Opportunities. Report of the E-Learning Advisory Group. Wellington.

Perraton, H. (2000). *Open and Distance Learning In The Developing World.* London. Routledge.

Razali, N. (2001). The Smart School Pilot Project: An E-education Initiative Towards Capital Building on Human Resources. Taiwan. APEC. Edu 07 01-06.

Rumble, G. (1997). *The Costs and Economies of Open and Distance Learning*. London. Kogan Page.

Tang, M. (2001). Responding to the Development of the New Economy: Opportunity and Action. Taiwan. APEC, Economy Report.

Ying-Jeou, M.(2001) New Lifestyles in Cybercities. Taiwan. APEC. MA 1 - MA 11.