

Overcoming the Digital Divide – A Proposal on How Institutions of Higher Education Can Play a Role

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Abstract

The concept of creating a *global village* was first visualised in the 1960s and with the advent of the Internet technology, it seemed that the realisation of such a concept was inevitable. Unfortunately, this did not happen. The article starts with a brief description of the global problem of the digital divide and then moves on to explain why the digital divide is a problem that requires immediate corrective action. The focus of the paper is then turned to a strategy that can be adopted in Malaysia to overcome the obstacles of the digital divide. In this strategy, the proposed approach involves institutions of higher learning, the industry, the rural society and the government. Finally, the paper concludes that active participation in the global village is imperative for future prosperity and survival.

INTRODUCTION

The advent of information and communication technology (ICT) has inspired us to think beyond national borders. The rapid development of the Internet technology has enabled us to collaborate, communicate and conduct our business online. It is the technology which has converted us all to what is described as *netizens*. As netizens, we all live in an environment, which is intelligently portrayed as a *global village*. As described by Wolfe (in Cruz, 1998), a global village is a digital civilisation in which all humanity will be wired up online, so that geographic locations and national boundaries will become irrelevant. The term *global village*, which was first coined by McLuhan (1998), has become synonymous with an information superhighway. In other words, quick access to information anywhere in the world and the Internet is a great step towards this vision.

The Internet is indeed a powerful technology. It has changed the way we do business, the approach to education, the manner in which we work, the mode through which we socialise, the means we communicate and the style in which we govern ourselves. In short, the Internet has revolutionised all aspects of our lives. It has fundamentally changed the nature

of work and recreation – and even love. Prior to the digital era, we were familiar with the term *economic divide*. To a layman, the term simply means the material gap between the rich and poor. An economic divide is synonymous with the difference between those who have material wealth and those who do not have it. In the global village, the digital divide exists because there are people who do not have access to digital information and those who have access to the information. The term *digital divide* usually refers to the great disparities between and within societies in the use of digital technology (Holmes, 2003).

The problem of the digital divide exists everywhere in the world, not only in developing countries but also in the industrialised countries. In the United States of America, for example, there is a digital divide between the whites, blacks and the Hispanics. According to the latest UN Human Development Report (Annan, 1998), industrialised countries, with only 15 percent of the world's population, are home to 88 percent of all Internet users. Less than one percent of people in South Asia are even online, even though it is home to one-fifth of the world's population. The situation is even worse in Africa. With 379 million people, there are only 14 million phone lines. Eighty percent of these lines are in only six countries. There are only one million Internet users in the entire continent compared with 10.5 million in the United Kingdom (Black, 2003).

The digital divide in Malaysia is still growing and this calls for a serious and concerted effort to overcome it. Until June 2003, the number of Internet subscribers in Malaysia was 2.73 million. The statistics show that 93 percent of the Internet subscribers were concentrated in urban areas (Ramasamy, 2004). Malaysia is very fortunate in that its government is a firm believer of information technology (IT) as an enabling tool that can be utilised to achieve the country's ambition to be a developed nation by the year 2020. This is evident by the country's huge investment in setting up the multimedia super corridor and technology parks to facilitate IT utilisation. However, there exists a digital divide between its large rural population and its congregated urban population. Realising that the disparity needs urgent and serious attention, many well-meaning parties have put in efforts to address the problem. State governments have been given financial allocations to conduct activities that can help minimise the problem. Unfortunately, there appears to be no standard approach and no coordination between groups of digital divide campaigners. As a result of these uncoordinated efforts, overlaps and repetitions occur. State governments are utilising their own efforts to address the problem. On the other hand, big national companies like Telekom Malaysia Berhad (TMB), Jaring, Petronas and multi-national companies like IBM, Motorola and Fujitsu, have donated generously towards the eradication of the digital divide problem. What about institutions of higher learning? How can universities and colleges contribute towards solving this problem?

This article proposes a project that can be adopted by all institutions of higher learning in Malaysia to help minimise the existence of the digital divide between the communities in the urban and rural areas. In the following section, we explain why the digital divide needs to be eradicated. We then present to the reader some examples of the efforts that have been carried out to minimise the digital divide in Malaysia and this is followed by a proposed strategy that can be adopted by institutions of higher learning.

THE DIGITAL DIVIDE

To some countries, the problem of the digital divide is insignificant when compared to other more pressing issues. Many people continue to lack fundamental things for living such as jobs, shelter, food, health care and drinkable water. How is having access to the Internet going to change their lives? In countries where people do have these basic necessities, inaccessibility to basic telecommunications services is deemed a hardship almost as acute as the mentioned deprivations. Given the above scenarios, the next question to ask is perhaps what real crisis can a digital divide bring on to us that has made IT strategists very much occupied with, and championing, its management?

The rich will get more

Prosperity and the proliferation of technology are seen as the means to alleviate poverty and ensure a better quality of life for the people living in developing countries. Unfortunately, the power of technology has not managed to eradicate poverty even in a country like the United States. The national poverty rate remains at 11 percent – essentially where it was before the computer revolution in the mid-1970s. Nearly 40 million Americans lack national health insurance and over 15 percent of its children are growing up in poverty. Technology and market forces have thus failed in the eradication of poverty in the United States (Venkat, 2002). If a country like the United States fails to eliminate poverty within its borders, it is unthinkable to expect third world countries to be capable of doing so. Over the last quarter of the twentieth century, the income gap between the rich and the poor in the United States has increased by more than 50 percent. The inference that follows is that as the propagation of new technologies advances, people who are doing relatively well are likely to benefit the most, reinforcing long-standing economic disparities.

Imbalance in nation building

The wealth of the nation is to be shared equally amongst all races and ethnic groups. In a multi-racial country like Malaysia, if one of the ethnic groups is economically superior to the others, dissatisfaction is bound to ensue and this will be enough fuel to fire racial tensions. In the digital era, the difference between groups of people who have access to digital information and those who do not will be an influential factor in determining their economic success. If the situation is left unchecked, the economic inequality will grow even larger. Correcting the situation will enhance the dignity of every ethnic group within the society. This will bring about racial harmony and make a country strong and proud in the eyes of the world. When a society has no digital divide, every group will be able to participate in nation building and this will help towards the creation of a knowledge society (Benson, 1998).

Loss of business

Where computer giants like Hewlett-Packard and Microsoft Corporation are concerned, the digital divide is bad for their business and is a major concern. The digital divide bars billions of people from buying their products. If billions of people around the world are not computer literate, the same number will have no use for computer products. The rural poor in developing countries are not seen as business opportunity. From the business point of view, reducing the digital divide will eventually lead to better sales of computer products.

Shrinking the economic divide will contribute to the narrowing of the digital divide (Conradie & Jacobs, 2003).

EFFORTS MADE TO CLOSE THE DIGITAL DIVIDE IN MALAYSIA

Various major efforts have been made by several parties – state governments, giant national corporations and multi-national companies. The following describe some of these efforts:

- e-Melaka
The Melaka state government launched its Closing the Digital Divide project in 2003. In this scheme, cyber cafes were used as training centres to teach the rural public ICT literacy. Busloads of rural citizens were brought to the cyber cafés and for every course participant, the state government paid the cyber café owner RM5 per hour. By the end of 2004, the scheme had managed to train 25,000 participants (e-melaka, 2004).
- e-Bario
e-Bario is a project that utilises computers, telephones and VSATs to connect villagers in the remote areas to the Internet. This project was designed to bridge the gap between the shy and unexposed students in the village of Bario and their aggressive, well-informed counterparts in larger cities. Villagers were introduced to computers and this has helped both to improve information flows to and from the outside world and to better their socio-economic position (e-Bario, 2001).
- Jejak-IT
In order to further promote the level of IT literacy and to upgrade the skills of learners, Jejak IT, an online IT learning centre run by the National State Library of Selangor, was introduced (Jejak-IT, 2005). This centre offers IT related e-books and dozens of affordable learning packages with different levels of understanding in IT. An interested user can subscribe and make payment online to a learning package that he/she is interested in and the lesson begins. This is a very convenient arrangement especially for those in remote areas and also for those who are not able to be physically present at formal IT classes.
- The Mobile Internet Unit
In the state of Selangor, with a US\$75, 000 grant from UNDP and donations from DRB-Hicom, MIMOS and Hup Lee Coachbuilders Sdn Bhd, the Mobile Internet Unit was launched in 2004 with the intention of addressing the digital divide that is evident in the Malaysian educational system. The project consisted of three buses equipped with 20pcs with visits made to 20 schools that were without computer facilities in central Selangor, while two smaller ones, with 12 computers each visited 20 schools in the capital. It is reported that 2,400 students and 400 teachers have benefited from this programme (Idrus & Atan, 2004).

- Cyber Cafés
In Tumpat, a fishing village in the state of Kelantan, cyber cafés have been established to bridge the digital gap. Two of these cafés are located in the town centre, three in the rural area and two more operate in the villages. These cafés are frequented by school students, teenagers and older villagers (Alhabshi, 2004).

It is obvious from the above descriptions that a substantial amount of resources has been put into the activities dedicated to overcome the digital divide. However, none of these reported efforts has involved universities and colleges on a big scale. The e-Bario project includes Universiti Malaysia Sarawak as a collaborator, but only a few researchers from the university have actually been directly involved in its operations.

In the next section, we describe how institutions of higher learning can play their role in overcoming the digital divide problem.

A STRATEGY TO OVERCOME THE DIGITAL DIVIDE

The National Information Technology Council (NITC) has stressed that in order to address the issue of the digital divide, all groups of society, including geographically isolated communities such as the natives of Sabah and Sarawak, women, youths, the disabled, small and medium sized enterprises (SMEs) and senior citizens, must work together (Manecksha, 2002).

Many researchers have studied and reported their perceptions and recommendations on how best to resolve the problem of the digital divide (Gurak, 1999; Panchanathan, 2002; Pavathamma, 2003 and Briggs & McBride, 2002). In this paper, we propose that the digital divide problem can be resolved or minimised with the involvement of four main players:

- Institutions of higher education
- The industry
- The government
- The rural community

Figure 1 shows the roles played by the four key players in the eradication of the digital divide. The digital divide can be reduced by setting up community information centres to educate the poorer rural citizens. These centres will be equipped with multimedia PCs and relevant software to enable even those who are illiterate – or those who do not speak English – to use the computers via icons and the mouse. Educated and unemployed youths in rural areas should be equipped with skills to enable them to use software such as the Microsoft Office and Internet browsers as well as gain access to Internet resources.

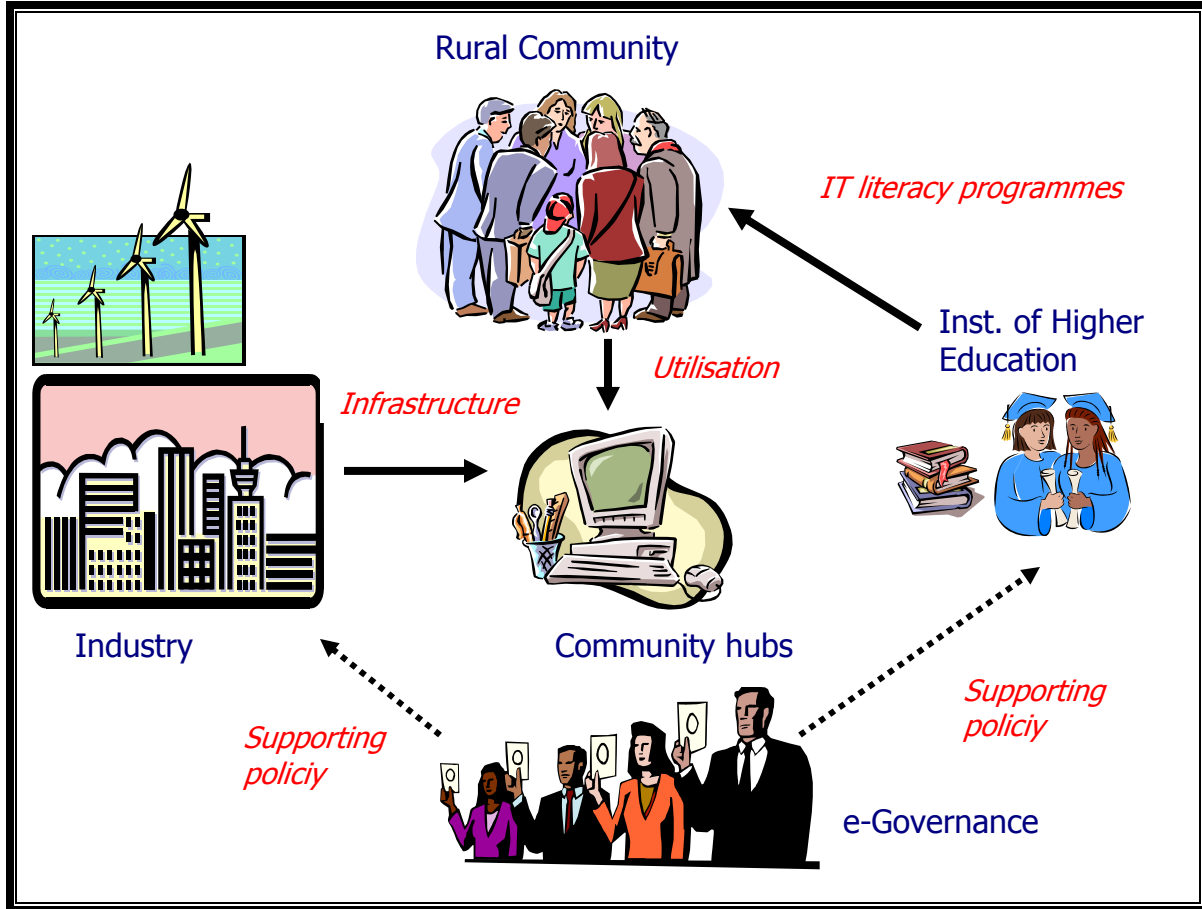


Figure 1 The roles of the four key players in eliminating the digital divide

The Role of Institutions of Higher Education

According to UNESCO findings, the literacy rate in developed countries is 98.7 percent while the rate in developing countries is 70.4 percent (Annan, 1998). Where Malaysia is concerned, the literacy rate is 83.5 percent. This is a very encouraging finding for Malaysia because a high literacy rate will contribute towards a high computer literacy level and this will play a role in narrowing the digital divide. Computer education has already been introduced in schools and teachers are equipped with laptop computers for the purpose of preparing school lessons (Alias et. al., 2003).

There are 18 public universities and more than 500 private institutions of higher learning in the country. Although most of the latter are located primarily in the major cities and towns, many of the public universities are located in the proximity of rural areas. The locations of these universities are important because they can focus on the neighbouring rural areas. If they are well spread out, it will mean that more rural areas can easily be assisted. Each of the public universities offers Computer Science/Information Technology degree programmes. On an average, a university enrolls approximately 200 students annually for these

programmes. In the case of Universiti Malaya, for example, the 2004/2005 intake for the Faculty of Computer Science and Information Technology was 280 students (FCSIT, 2004).

In most public universities, students enrolled for Computer Science/Information Technology degree programmes spend 20 weeks of their industrial training attached to IT companies. This gives the students an opportunity to experience what it is like to work in an IT environment and to see how computer concepts are applied in the real world. Here, we see an excellent example of how the universities and the industry can support each other. We have actually brought the universities to the industry. What about bringing the universities to the society?

In the 1970s, Universiti Putra Malaysia (UPM), formerly known as Universiti Pertanian Malaysia, organised *anak angkat* or “foster son/ daughter” programmes. In essence, during the long semester holidays, undergraduate students were placed in villages and lived with families as their foster children. While these students were in the villages, they helped their foster families with their agricultural activities. These programmes were very successful and gained wide television coverage at the time. The villagers profited from these programmes because the students brought with them new ideas and gave them advice on how they could improve their agricultural activities. The students likewise benefited from the programme because they were given the opportunity to apply what they had learned in the university. Based on the same idea, we could formulate a similar programme for Computer Science/Information Technology degree students. Instead of the sharing of agricultural knowledge, these students could impart ICT literacy knowledge to the rural society. For graduation in a Computer Science/Information Technology degree programme students have to accumulate 108 credit hours with 15 credit hours being from the category of university elective courses. If universities could attribute each student three credit hours of existing university elective courses if they participated in the placement programme, it would benefit all parties. The rural society would gain an opportunity to be educated with ICT literacy courses. The students would earn three credit hours towards graduation and at the same time, be able to contribute to the rural society, which could be their very own hometown or village of origin. To ensure success, however, these students need to be well briefed and coached on what to teach and how to teach the rural society. The universities have to agree on a standard content and format of an ICT literacy programme for the rural communities.

The Role of the Industry

A good infrastructure is essential for the abolition of the digital divide. Ensuring the availability of basic energy infrastructural facilities such as electricity, telephone lines and roads will also help to bridge the digital divide. The introduction and establishment of the use of the Internet and email services would require the presence of an adequate communications infrastructure. Where areas are without any telephone lines, the introduction of satellite and wireless technologies to bring the Internet and email services to the communities is an option; this would also lead to a community structure build-up as in so doing, a mechanism is created that enables the distribution of different types of vital information within a community. For example, linking schools would enable the exchange of information which would be advantageous to cooperative education initiatives.

Organisations in the urban areas are constantly upgrading their facilities to keep abreast with new computing developments and also to meet their requirements for more and more sophisticated processing functions. Their old computers, which are still usable, have often been donated to schools and voluntary bodies. This is where the public-private sector partnership can contribute towards providing the required infrastructure; such as telephone lines, computers, and the setting up of community centres in rural areas. The supply of the necessary power sources, equipment and communications infrastructure is not sufficient. In the Smart Newtown Community project (Crump & McIlroy, 2003), organisations like Fujitsu, Hewlett Packard and Microsoft have donated recycled PCs for the setting up of community computer centres. This is where non-governmental organisations can contribute to, and be involved in, the popularisation of digital information. In Malaysia, Jaring and Mimos are seen as two eligible collaborative partners to be wooed.

The Government Policy

The Malaysian government has entrusted the direction of IT implementation and utilisation to be guided by the National IT Council (NITC). The newly elected NITC members have made a resolution to deal with the issue of digital divide in the country. This can be seen as the government's zeal to get to the bottom of the issue of the digital divide (Manecksha, 2002). Over the last decade, the government has introduced supporting policies to assist its citizens to bridge this divide. Firstly, it has removed all taxes on computers and related items, with the intention of bringing their prices down. Factories have been built to produce local own computer hardware for both the local and overseas markets. Citizens are allowed to withdraw their savings from the Employees' Provident Fund to purchase computers. Students are given low interest loans to encourage them to purchase computers. Some studies have indicated the existence of high computer ownership in Malaysian homes but a relatively low usage of the Internet. One such study observing the digital divide in a housing estate in Kuala Lumpur revealed that 38.5 percent of the homes have a personal computer (Noor Bathi, 2001). This study further indicates that the majority of Malaysian citizens are aware of the need to expose their families to the use of PCs and perhaps only economic limitations prevent them from owning a unit.

The Rural Community

Members of the rural communities can participate in the global village when they become ICT literate. How can we ensure that relevant programmes reach the maximum number of rural communities? Figure 2 shows how the ICT literacy programme will be presented to the rural communities.

According to Crump & McIlroy (2003), the success of ICT literacy programmes involving the general members of the society is very much dependent on human factors and the local politics. It is crucial to win the support of "local champions" before success can be realised. Learning from their experience, it is best to set up such a structure before embarking on the project. The ICT champion at the state level will identify the parliamentary constituents that

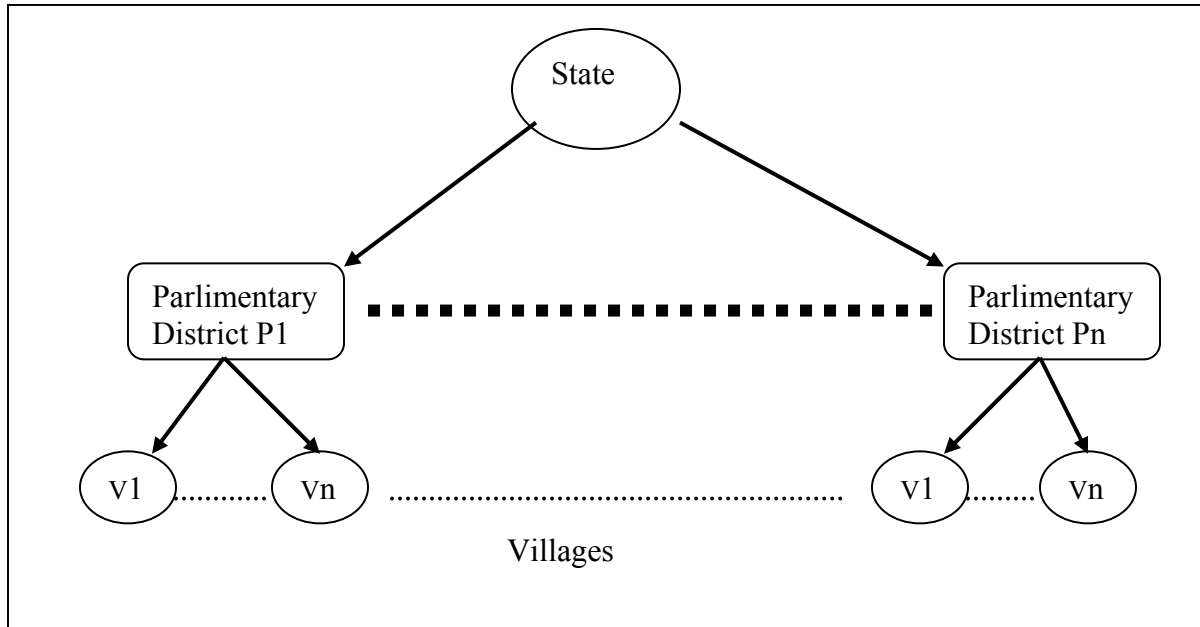


Figure 2 Coverage of the University Literacy Programme

will be selected to participate in the programme for each year (P1 to Pn). In Figure 2, a parliamentary constituency is represented as Pn and a village is represented by Vn, where n is any integer greater than 0. The parliamentary constituent will select the village/s that will be involved in the ICT literacy programme. The village headman will then select the villagers who will actually be “students” in the ICT literacy classes. The local champion will be the person entrusted to take charge of the running of the community hubs.

Having the necessary computer equipment installed and the supporting infrastructure and training in place in rural areas are not enough. There must be a purpose behind the acquisition of IT skills by the rural population. If the newly acquired IT skills could create opportunities for the people to establish themselves in careers related to the ICT domain or empower them to conduct business with the outside world, overcoming the digital divide could be meaningful to them.

As an illustration, a small business or local facility that uses ICT to provide certain essential services to the community could be established. Training on computer usage would first be given to a few individuals. When competent, these individuals would train other individuals in the local community. These community hubs could then be utilised by the residents to do trading with parties from outside their villages and even enable them to participate in e-commerce activities. Residents in rural areas would be able to reach their customers directly and expand their markets, a possibility which was never thought possible without the use of the Internet. Unemployed youths could use the community hubs as a means to gain ICT-related skills and enable them to seek employment without having to incur the cost of travelling to the nearest town.

CONCLUSION

It is now clear that the problem of resolving the digital divide lies in the challenges from both the technical and social fronts. In meeting these challenges, the interests of every group must be taken into account. Everyone must be brought on board the ICT band wagon. The technology divide should not have to follow the income divide. Nevertheless, current evidence indicates that the current technology divide has consistently followed the income divide all over the world. It is not surprising that people tend to adopt the notion that we must initially overcome the economic disparity before we can be successful in the resolution of the digital divide problem. The ICT strategists can also argue that overcoming the digital divide obstacles may narrow the economic divide gap. The digital divide is meaningless to the multitudes everywhere who lack essential provisions such as adequate nutrition, primary health care, basic education, safe water and sanitary living conditions. This is a grave reality for those in poor third world countries. The divide always exists and if left ignored, it will grow wider as time passes by. Governments and leaders who have adopted strategies to address the issue have done the right thing. Their policies will help to keep their countries intact in the global village and enable them to remain competitive in the present millennium. Malaysia is a country that is capable of helping itself to emerge from the digital divide. We have visionary leaders, supportive infrastructures and a politically stable country. All we need now is the will power to make the project happen.

REFERENCES

- Alhabshi, S.M.S. (2004) Bridging digital divide in marginalized areas: Focus on IT policy, planning and implementation issues in Malaysia. *INPUMA*, 14(1).
<http://www.iimahd.ernet.in/egov/ifip/april2004/Article%201.htm>
- Alias, D., Zainab, A.N. & Zaitun, A.B. (2003) The impact of IT on higher education for Malaysia. *Proceedings of the President Forum of Southeast Asian Universities*, National Cheng Kung University, Taiwan, pg 90-96.
- Annan, K.(1998). Knowledge and civilization. The First Annual Eqbal Ahmad Lecture, Hampshire College, Amherst, Canada. 16 September.
http://www.bitsonline.net/eqbal/tribute.asp?id=8&tribute_from=FAP
- Benson, P. B. (1998) Village people? The Net Generation, *IEEE Communications Magazine*. vol. 36, no. 1, pp. 32-35
- Black, J. (2003) Bridging the digital divide. *BBC News Online*.
http://news.bbc.co.uk/hi/english/special_report/1999/10/99/information_rich_information_poor/newsid_472000/472621.stm
- Briggs, L. & McBride, K.B. (2002) Rethinking the digital divide, *Computer*, 35(10), 107-108.
- Conradie P. & S.J. Jacobs. (2003) Bridging the digital divide, *Engineering Management Journal*, 13(1), 30-33..

Crump, B. J. & McIlroy, A. (2003) Evaluation of the Smart Newtown Pilot Project 2001-2002. Presentation to the senior management team of Fujitsu Corporation, Wellington, New Zealand, March 2003.

Cruz, T. (1998) Re-tribalizing the global village. *M Theory*, Vol. 2.
<http://www.mala.bc.ca/~soules/mtheory/vol2/cruz3.htm>

e-Bario, (2001). International telecommunication union.
http://www.itu.int/osg/spu/wsis-themes/ict_stories/e-bariocasestucy.html

e-Melaka (2005)
<http://www.e-melaka.gov.my>

Gurak, L.J. (1999) Thinking big in the global village. *Proceedings of Professional Communication Conference 1999 (IPCC 99)*, *IEEE International* 7-10 September, pg 1-4.

Holmes, N. (2003) The digital divide, the UN, and the computing profession. *Computer*, 36(12), 144-143.

Idrus, R.M. & Atan, H. (2004) Closing the digital divide in Malaysia – catching them young, *Malaysian Online Journal of Instructional Technology*, 1, (1).

Jejak-IT (2005) <http://www.jejak-it.com>, last access date: 17/1/2005.

Manecksha F. (2002) Tackling the digital divide. *News Straits Times*, 29 April.

FSCIT. (2004) Faculty of Science Computer and Information Technology.

McLuhan M. (1998). BBC interview.
<http://www.videomcluhan.com/interv1.htm>

Morgan K., Brebbia C. A., Sanchez J. & Viskounsky A. (2004) Human perspectives in the Internet society: culture, psychology and gender, WIT Press Southampton, Boston, 2004.

Noor Bathi Badarudin. (2001). The digital divide at the urban area: The case study of Taman Seri Sentosa, Kuala Lumpur. (in Malay). Paper presented at the Digital Divide Workshop: The search of the Relevant Model. 16 May, Universiti Malaya.

Panchanathan S. (2002), Ubiquitous multimedia: bridging the digital divide, *Multimedia, IEEE* Vol. 9 Issue 1 Jan-March 2002, pg 12-15.

Pavathamma, N. (2003). Digital divide in India: Need for correcting urban bias. *Information Technology and Libraries*, 22(1)

Ramasamy, C. (2004), Minda: Internet and the Malays. *Harian Metro*, 19 January, pp 10.

Venkat, K. (2002). Delving into the digital divide. *Spectrum IEEE*, 39(2), 14-16.