



TAKING OUR OPPORTUNITIES: SOCIAL COHESION AND THE KNOWLEDGE DIVIDE IN AOTEAROA, NEW ZEALAND

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DEFINING THE KNOWLEDGE SOCIETY

Knowledge, its development and application by us as New Zealanders is becoming the primary resource on which the strength of our economy will rely.

This transformation to a knowledge driven society is occurring rapidly, resulting from an increasing globalisation, a world wide process of deregulation, a revolution in telecommunications and information technologies, increasing levels of automation in manufacturing processes, a growth in knowledge intensive business, and the use of knowledge to solve business, social and environmental problems.

These forces have the potential to transform the economic prospects of countries, the structure and nature of both social and economic institutions, the operation of firms, the nature of work, and of how we define ourselves as a people. They also have the potential to challenge the underlying nature of relationships and power within and between groups within society.

In this paper we explore the implications of these changes for New Zealand society. We identify two potential courses. In the first, elements of society become increasingly polarised and marginalised. Within this model the transformation to the knowledge based society further entrenches social dislocation and destabilises social cohesion by demarcating groups in terms of their access to and participation in knowledge building activity. A consequence of this path is the disengagement from wider social and economic activity of a large number of groups. The cost of this path will be substantial, with a requirement to support high numbers of beneficiaries throughout their lives, a population reliant on a narrowly based segment of the population contributing to economic productivity and the resultant loss and waste of significant talent from the economy. In this scenario, low levels of social cohesion are likely to result in an absence of a democratically derived mandate to ride the knowledge wave. A resultant consequence beyond disengagement may be the development of significant hostility towards key aspects of social organisation.

The second course sees the transformation to a knowledge society as providing opportunities to address historical disadvantage, facilitating widespread economic and social participation. This approach argues that for New Zealand to compete globally we need to access the talent and potential of all New Zealanders. This model actively exploits and celebrates difference among the groups which constitute New Zealand society, it balances economic endeavour with social responsibility and development. Development of strong communities locally is seen as pivotal to strong economic performance globally. Political, economic and social direction in this model is determined through widespread consensus. In this approach investment decisions are long term, and address not only economic imperatives, but balance these with social and environmental objectives.

Social Cohesion

Many definitions of 'social cohesion' exist. Work in Canada through the Canadian Policy Research Network and the Policy Research Initiative of the Canadian Government, defines *social cohesion* as the ongoing process of developing a community of shared values, shared challenges and equal opportunity,

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based on a sense of trust, hope and reciprocity^{3,4}. In this definition, notions of social cohesion include an acknowledgement of the ongoing process through which individuals and groups are included or excluded from participation in society. This view of belonging encompasses the extent to which shared values, notions of commitment, and identity are held by a society. It is concerned with issues of inclusion, equal opportunities of access, participation, recognition, tolerance, understanding of difference, and acknowledgement of pluralism and legitimacy (Jensen 1998:15)⁵. This framework also includes an examination of the notions of the challenges faced by society.

Factors commonly identified as contributing to, or working against social cohesion include: ethnicity, gender, disability, culture, religion, identity, sexual orientation, ability/disability, geographic location or isolation, income, education and training, the existence of marketable skills and employment opportunities, lifestyle choices, social class and demographic change in terms of age, population concentration, and the growth of migrant and new population groups.

GOVERNMENT RESPONSES TO THE ISSUE OF SOCIAL COHESION

Governments around the world are increasingly recognising the interdependence of economic and social well-being in the context of globalisation.

UK & Europe

In the UK and Europe the pursuit of 'social cohesion' has increasingly been manifested through social and economic policy oriented at addressing issues of 'social exclusion'. Elimination of social exclusion is written into the Maastricht Treaty as an objective for Europeans. In England it has gained prominence through the establishment in 1997 of the Social Exclusion Unit, to report to the prime minister on how to develop integrated and sustainable approaches to the problems of the worst housing estates, including crime, drugs, unemployment, community breakdown and bad schools. (Percy-Smith, 2000). Similar programmes have been established in Scotland (the Scottish social exclusion strategy); in Wales, (Building an Inclusive Wales) and in Northern Ireland (Targeting Social Needs in Northern Ireland). The New Labour Government in their first term identified a range of programmes and initiatives aimed at addressing issues of social exclusion⁶. These programmes have been accompanied by the setting of specific targets and a programme of actively monitoring and reporting on progress towards these targets (Department of Social Security 2000, Opportunity for all: Tackling Poverty and Social Exclusion, London: www.dss.gov.uk).

Ireland

As part of the New Vision for Ireland, there has been a strong commitment to ensuring that the Irish economy continues to capitalise on recent successes in a manner that will contribute to maintaining economic competitiveness, while at the same time addressing issues of social justice. Key elements of the Irish approach include: economic inclusion based on full employment; social inclusion - reflecting full participation in those activities which constitute the norm in society; successful and continuing adaptation to change; commitment to the utilisation and development of the potential of the "information society" and the promotion of research and development; commitment to lifelong learning; "sustainable and balanced development" between regions and between urban and rural areas; commitment to the further development of the European Union and international solidarity; and the development and promotion of an entrepreneurial culture (National Economic and Social Council 1999). The Irish Government has also seen research and education, particularly tertiary education as a major area for investment.

THE BUILD UP TO THE KNOWLEDGE DIVIDE, LEARNING FROM OUR HISTORY

OECD countries in both the Northern and Southern Hemispheres have been required to address the critical questions that on around the interaction of social and economic policy. The immediate two

³ Working definition (adapted) from Social Cohesion Research Network, 2001. www.sshrc.ca

⁴ An alternative definition by Geddes (1998:20) defines Social Cohesion as a system of organisation based on market forces, freedom of opportunity and enterprise with a commitment to the values of internal solidarity and mutual support which ensures open access to benefit and protection for all members of society." Geddes 1998 Local Partnership: A Successful Strategy for Social Cohesion. Dublin: European Foundation

⁵ See also Berger-Schmitt & Noll 2000 "Conceptual Framework and structure of a European System of Social Indicators" EUReporting Working Paper No.9 Social Indicators Department Mannheim

⁶ These included addressing: the lack of opportunities to work, the lack of opportunities to acquire education and skills, childhood deprivation, disrupted families, barriers to older people living active, fulfilling and healthy lives, inequalities in health, poor housing, poor neighbourhoods, fear of crime, disadvantaged groups.

decades of post-war achievement spawned a range of protective welfare states and high levels of employment. Aotearoa, New Zealand was a beneficiary of this era when both income and socio-economic equality levels were high. This idyllic picture began to change around the mid 1970s

A fiscal crisis during that period and into the 1980's impacted heavily on the New Zealand economy. Debt levels, inflation and unemployment escalated, as economic growth plummeted. The raw agricultural and colonial base of the New Zealand economy was ill-equipped for Britain's entry into the European Common Market and the increasing international competition of modern global markets. By the early 1980s, there was substantial pressure to change economic direction.

The economic reforms that began in the mid-1980s were essentially designed to speedily help New Zealand producers become internationally competitive and to move the country's current accounts into balance. The period was marked by the removal of subsidies and many tariffs, deregulation of the labour market, fundamental changes to the tax system including the introduction of a goods and services tax and the privatisation of numerous government services.

This structural adjustment focused primarily on macro-economic outcomes in the hope of a "quick fix". However, unemployment escalated from 4% in 1987 to 10.6% in 1992 (Statistics New Zealand 2000). Furthermore, there was no preparatory plan to up-skill workers for the new economic environment, nor were new sunrise enterprises put in place to take on displaced workers.

The impact on the Maori and Pacific communities, in particular, was devastating. Many households were moved from rural New Zealand and Pacific Island countries to service industrial development in the 50s and 60s with the promise of a more prosperous lifestyle, only to be abandoned in the 80s and left inadequately skilled for the new economic environment. Likewise, a disproportionate number of school leavers and other young people were inadequately prepared for the new environment.

The following table illustrates the disproportionate impact of unemployment on Maori, Pacific and young people over the period 1987 to 1999 in relation to the rest of New Zealand.

Table 1: Unemployment rates by year and ethnicity

Year	NZ European/ Pakeha	Maori	Pacific	Other	Total
1987	3.2	10.8	6.1	3.4	4.0
1991	6.5	21.1	22.7	10.4	8.4
1995	5.5	19.4	20.6	10.6	7.5
1999	5.5	18.6	14.8	13.3	7.5

Source: Statistics New Zealand (2000) Labour Market 2000. Wellington: Statistics New Zealand.

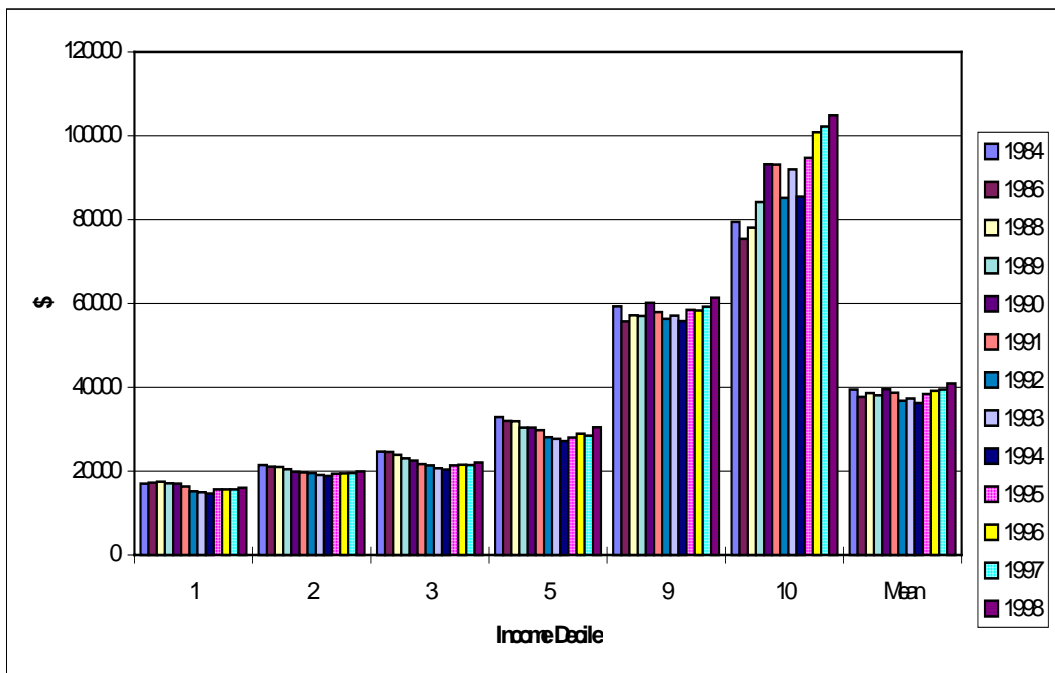
The 1991 budget cut benefits substantially and removed the protective 25% of income cap on rent for beneficiaries in state houses. Part charges for health, education and employee contributions for accident compensation were also introduced. The combination of increased unemployment and the significant reduction in social protection created unprecedented levels of post war hardship and moved many households into poverty.

In 1989, the Auckland metropolitan area had only 16 foodbanks, but by 1994 there were 130 (McKay 1995). The client list for Salvation Army foodbanks grew from 1,226 in 1990 to 14,906 in 1994 (Gunby 1996). Economist Brian Easton found that households in poverty, as a proportion of all households in New Zealand, grew from 11.6% in 1981/82 to 12.9% in 1989/90. After the social policy changes, it increased substantially to 16.3% in the 1992/93 year (Easton 1995). In the same year the New Zealand Poverty Measurement Project (NZPMP) found 18.5% of households to be below the poverty line in their study (Stephens et al 1995, Waldegrave et al 1996, Waldegrave 1998). Easton found 29% of all children were in the lowest 20% of household incomes, whereas the NZPMP found 33% of all children below the poverty line.

During the same period, the standard of living for most New Zealanders dropped substantially. Chart 1 sets out the trends in real household disposable income for different decile (10%) groups from 1984 to 1998 (Stephens et al 2000, Waldegrave et al 2000). Decile 10 refers to the wealthiest 10% of households in New Zealand. Their household incomes increased 43% over the fourteen year period.

During the same period, the bottom 50% of household incomes dropped 14%. Only the top 20% improved their economic position, but decile 9 only improved marginally.

Chart 1: Trends in Real Household Disposable Income 1984-1998



Source: New Zealand Poverty Measurement Project using data extracted from the Household Economic Survey

Although wider New Zealand reaped little economic benefit from these reforms by comparison with other like countries, apart from the brief 1994 to 1996 period, the economy did begin to produce current account fiscal surpluses consistently from the mid-1990s. The structural adjustment mechanisms, however, had focused primarily on economic levers to the detriment of social investment, which had the effect of deepening levels of poverty and increasing social inequality. Ironically, the social costs of this were then at least partially responsible for the low economic growth over the period.

Certain groups were more detrimentally impacted than others by the reforms. The break down of poverty data for 1993 (NZPMP) showed:

- Single parent households with children were by far the largest household type living in poverty. 73% of all single parent families lived below the threshold and they made up 21% of those who are poor in New Zealand
- The incidence of poverty was more than 2 ½ times greater among Maori and more than 3 ½ times greater among Pacific Island families, than it was among Pakeha families
- Pakeha/European households make up 66% of all poor households
- 32.6% of all children in New Zealand were below the poverty line

Again, these figures illustrate the cultural and age bias for those on very low incomes.

The critical change was brought about by the reduced demand for manual labour as the economy moved from producing most of its own commodities into the global market, exposing it to much more international competition. Education, qualifications and marketable skills became more necessary. Those who did not have those skills, or were not able to acquire them, were left behind.

It has been fashionable in some circles to blame those individuals and households who were left behind during this period of massive structural adjustment. Social entitlements were reduced during the 1990s as a means of building incentives to work. The problem however, was in the social and economic policy approach. The economy simply did not produce the job vacancies required, and the jobs that were produced often required a higher skill level than existed among the bulk of those who were unemployed. Furthermore, there was no nationwide educational investment to substantially up-skill those whose skills had become redundant. Further still, sunrise industries were not developed to take up the employment slack.

This problem has now mushroomed into the knowledge divide. As data presented in the next section will show, many of these same groups have not been adequately supported to catch up and are now being left behind in the emerging knowledge society. We must learn from our history not to repeat the same policy

failures as we move through another transformation, as significant as the industrial revolution. The new knowledge environment has special opportunities to be much more accessible to every New Zealand household and to create greater equalities. The policy mix must encourage high quality education, technical skills and creativity for life. To benefit from this, households, of course, need to be secure and free from poverty.

NEW ZEALAND AS A KNOWLEDGE SOCIETY

Across many measures related to the knowledge society New Zealand ranks well⁷. New Zealand currently ranks 16th out of 55 countries on the International Data Corporation Information Society Index (Mansell and When; 1998). This index identifies critical indicators related to the development of the knowledge society. We are particularly well served in terms of Internet hosts per capita, and in public education expenditure. Where we are shown to perform less well is in regard to percentage of exports that are high technology and the proportions of computer science, engineering and maths graduates. Comparisons with other economies indicate that we are less well developed in relation to this index than is the case in United States, Finland and Australia. With countries such as Singapore, Malaysia, Mexico and South Korea identified as serious competitors.

Defining the Knowledge Divide

The above indicators fail to assess the extent to which New Zealand's population is more widely involved in these activities. The "knowledge divide" refers to the gap between those who are able to fully participate in a knowledge society and those who do not. Those who do, have been able to acquire and use a combination of some of the following: high basic skills; tertiary education; information and communication technological skills (ICT); creativity; and critical thinking. Those who participate are much more likely to experience a sense of belonging and security in a knowledge society. They are also more likely to be on higher incomes. Those who do not, are more likely to be marginalised in a knowledge society, both socially and financially. This experience of marginalisation is often referred to as "*social exclusion*".

International studies identify the levels of education and income as the best predictors of inclusion or exclusion in the knowledge society. The other variables they note are household size and type, age, gender, racial and linguistic backgrounds, and location (OECD 2001). The New Zealand Government names the following groups as being most at risk of being excluded: Maori and Pacific people; those on low incomes; sole parents; older people; people with low or no qualifications or poor literacy; the unemployed and underemployed; people in locations lacking a sound telecommunications structure such as rural areas; women and girls; and people with disabilities (Maharey and Swain 2001).

The Social Report (Ministry of Social Policy, 2001), has provided an insight into the quality of life for New Zealanders across a wide range of social and economic indicators, and compares these across various population groups and internationally. It highlights significant disadvantage for a number of groups within our society, in terms of their health, literacy skills, educational qualifications, income levels, and involvement in paid work.

Although Aotearoa, New Zealand is lagging behind many OECD countries in its embrace of the knowledge society and particularly the knowledge economy, it scores around the middle and sometimes higher on most educational indicators when they are compared internationally. Compared with other OECD countries we rank:

- sixth for participation in early childhood education out of twenty eight
- eleventh for the proportion of the population aged 25-64 years having at least an upper secondary educational qualification out of twenty eight
- fourteenth for the proportion who have completed tertiary qualifications to Bachelor degree or higher out of twenty eight
- third in average prose literacy of thirteen countries tested ninth in quantitative literacy of thirteen countries tested
- eighth in participation in tertiary education for both men and women out of twenty two
- ninth for the number of internet subscribers as a proportion of the total population out of twenty six (Ministry of Social Policy 2001).

The lower ratings for quantitative literacy and completed tertiary qualifications should be a concern to a country anxious to be recognised as a knowledge society. So also should the associated drop in the

⁷ See also New Zealand Herald (1999) "NZ Slides down info league" and UNLIMITED July 2001 "Stopping the tech slide"

proportion of science students graduating in New Zealand as a proportion of total graduates from 42% in 1985 to 24% in 1995 (Statistics New Zealand 1997) Leading knowledge societies like Finland, Ireland and Singapore invested heavily in education, especially technical education as a major strategy to become leaders in the field (Information Technology Advisory Group 1999).

Given these concerns, a closer look at the New Zealand figures illustrates substantial differences among groupings within the population. People from within lower socio-economic areas are much less likely to gain formal educational qualifications than those from higher socio-economic areas. The following table sets out the qualifications attained in decile 1 schools (low socio-economic status) and decile 10 schools (high SES) in New Zealand during 1995.

Table 2: SES Decile and Coed Schools by Bursary Attainment and Leaving before Year 12: 1998

For Coed schools with 400 or more students		
SES Decile	Percent achieving C Bursary	Percent leaving before Year 12
1	45	32
5	72	16
10	83	14

Source: Nash and Harker 1998

There are also substantial ethnic differences in formal educational attainment. In 1999 43% of Maori school leavers and 54% of Pacific school leavers had Sixth Form Certificate or a higher qualification as compared with 66% for all school leavers and 71% for Pakeha. In the same year 4.5% of Maori and 4.2% of Pacific school leavers gained an A or B Bursary or higher as compared with 19.8% of all school leavers and 48.6% for Pakeha (Ministry of Education 2000).

These disadvantages are very serious because they have the potential to substantially limit these two groups from access to higher education and training and from active involvement in knowledge based economic activity as the following table illustrates.

Table 3 Population aged 25-64 with Tertiary Qualification by Ethnic group 1991 & 2000

	European/ Pakeha	Maori	Pacific	Other	Total
1991	8.4	1.3	.s	19.7	8.0
2000	12.6	4.1	4.1	30.8	12.6

Note: "s." sample too small.

Source: Statistics New Zealand 1991 & 2000

Education has a significant impact on earnings and labour market prospects. Workers without formal qualifications are almost three times as likely to be unemployed as those with a Bachelors degree (Statistics New Zealand 2001). At ages 25-64 earnings from work are close to 1.5 times higher for those with a tertiary qualification as compared with those for a school qualification (OECD 2000).

While recent years have seen an improvement in the relative earnings of New Zealand households, there is growing inequality between the top and bottom income groups (Mowbray M 2001). Between 1987/88 and 1997/98 income inequality between the top and bottom income quintiles increased from a ratio of 2.7 to 3.2 (Ministry of Social Policy 2001). Those population groups among the poorest in New Zealand include: income tested beneficiaries, sole parents, Maori and Pacific Island families, those who rent, and families with dependent children, particularly larger families.

FROM DIGITAL DIVIDE TO KNOWLEDGE DIVIDE

Many of those groups who are identified as not fully participating in social and economic endeavour and at risk of poor social and economic outcomes are also more limited in their ability to exploit knowledge tools. The Living Standards Survey conducted in 2000 explored the relationship between a range of factors contributing to the material well-being of various social and economic groups in New

Zealand (Fergusson et al, 2001). Included as part of this profile were questions relating to PC ownership, and Internet access. While this study reiterated other findings which show that overall access to these technologies is high by international standards, it identifies key divisions across a range of social groups. These differences show significant variation across generations, between families of different types, between different income groups, and between regions (Table 4).

Highest levels of personal computer ownership in New Zealand exist for those aged 35 to 54 years, those in the top 20 per cent of household incomes, among those who live in the Wellington Region, and for two parent families with a dependent child or children.

Lowest levels of ownership are for those ages 65 years and older, Pacific families, sole parent families with dependent children, Maori families and among beneficiaries. This profile is replicated in terms of internet access.

For Pacific Island and Maori families who owned a computer there was however found to be particularly low levels of internet use, as compared with other groups who owned PC's.

Particularly high levels of internet access (51%) were identified for families from non- Pacific minority ethnic groups. Which may indicate a stronger use of this tool among migrant communities in terms of communication and involvement in their country of source, and of the types of occupations these groups have typically been employed in.

The fall off in internet access and PC ownership by age is particularly marked with over half of those aged 45-55 reporting internet access while this drops to 36% among those in the later work force ages (55-64 years).

Groups who have signalled a significant desire for PC ownership and internet access, but for whom cost is seen as the largest single barrier, include Pacific families, sole parent families, Maori families, young people (aged 18-24 years) beneficiaries and those households in the bottom 20% of incomes.

Older New Zealanders tended to indicate the least desire for a PC doubling from 16% for those age 45-54 to 35% of those aged 55-64 years, and further increasing to 91% of those aged 85 years and over. This group also had the least desire for internet access, although there were also significant numbers of beneficiary household, sole parent families, households in the bottom 20% of incomes and those in rural or secondary and minor urban areas who also reported no desire for internet access.

While these findings focus only on the technology aspects of the knowledge society, they signify some of the complexity associated with the knowledge divide, and raise considerable issues as we go forward.

These issues include:

- the lack of economic resources to afford new technologies, including not only purchase cost but the hidden costs associated with ongoing maintenance, and the cost of technical support
- requisite skills to operate in these environments particularly cognitive processing, literacy, and numeracy skills
- social class, cultural, ethnic and age differences in preferences and tastes
- the limited ability of these tools to actively support Pacific and other languages,
- raising the awareness of the importance of these technologies, in term of their potential to facilitate access to various aspects of knowledge based activity, as tools for communication, and their potential in terms of cultural expression
- infrastructure to support technology access (particularly with regard to band width and the availability of technical support in isolated rural localities)
- maintaining resilience to technological change across groups within the population
- the high levels of obsolescence inherent with these new information technologies is a further challenges to those who have little economic means.

Table 4: PC Ownership and Internet Access By New Zealand Households In 2000

		<i>Personal Computer</i>			<i>Internet Access</i>	
	Population owning a PC	Population who desire a PC but can't afford one	Population who don't want a PC	Population reporting access to the internet	Population who desire internet access but can't afford it	Population who don't want internet access

	<i>Personal Computer</i>				<i>Internet Access</i>	
	Population owning a PC	Population who desire a PC but can't afford one	Population who don't want a PC	Population reporting access to the internet	Population who desire internet access but can't afford it	Population who don't want internet access
Age Group						
18-24yrs	41.6	35.2	16.7	34.3	32.6	20.8
25-34yrs	49.4	26.6	12.7	41.8	21.2	22.6
35-44yrs	70.5	16.0	7.6	50.8	16.4	21.5
45-54yrs	65.7	11.3	16.3	53.5	12.3	24.8
55-64yrs	44.9	10.8	34.2	36.4	9.1	40.5
65-74yrs	22.0	8.1	64.0	15.9	7.1	71.5
75-84yrs	9.1	3.8	82.7	7.1	3.6	85.4
85+	2.3	3.0	90.8	1.7	1.4	94.0
Household Income						
Bottom Quintile	43.2	31.2	21.5	31.4	27.4	33.1
Second Quintile	48.4	25.9	20.2	33.9	25.3	28.8
Middle Quintile	53.7	20.5	13.7	40.5	19.8	26.0
Fourth Quintile	63.3	15.5	11.1	50.1	14.6	22.0
Highest Quintile	69.5	8.3	11.7	64.6	7.0	14.6
Income Support						
Beneficiary	34.7	34.7	25.2	25.9	27.6	37.1
Non-Beneficiary	61.1	16.8	13.3	45.9	16.3	21.8
Family type						
Sole parent with dependent child(ren)	35.4	39.4	20.5	25.3	34.5	35.7
Two parent with dependent Child(ren)	67.8	18.6	7.6	49.6	18.0	20.7
All families with dependent children	62.4	22.1	9.6	45.6	20.8	23.2
Maori families	42.3	35.9	17.4	28.3	29.7	31.7
Pacific families	32.5	40.6	21.1	16.4	33.0	40.7
Pakeha families	57.1	14.2	21.4	44.3	13.9	30.5
Families from other ethnic groups	56.7	20.5	13.2	50.7	19.0	20.2
Location						
Auckland region	59.5	20.3	11.8	47.0	20.7	20.1
Wellington region	66.5	17.2	10.0	56.8	15.1	15.3
Other major urban areas	54.5	21.3	15.8	42.3	19.8	24.3
Secondary/Min or urban areas	45.2	24.3	22.5	40.0	16.1	35.5
Rural locations	55.1	17.0	19.6	39.1	17.1	31.1

Source: Ministry of Social Policy - Living Standards Survey (sample – 6742 New Zealand Households)

Are we investing in a Knowledge Future for Our children?

The advantage and disadvantage faced by children in different circumstances, in gaining opportunities to work with these technologies in a home environment is a major concern identified in the above data, but portray only one side of what for many families and children in New Zealand is a situation of poverty and material

disadvantage. Almost 30% of all children in New Zealand live in families which have been identified as having low incomes⁸. These households are not just beneficiary households, but include some 41% of children in families whose parents are involved in work (Krishnan in preparation).

The implications of material disadvantage in these families is pervasive. In the survey of living standards⁹ Fourteen percent of these low income families, reported that they were required to postpone taking their children to the doctor because of cost, this compared with 5% for all other families. Twenty three percent of low income families report that they restrict their children from school outings due to cost compared with 7% in the case of other families. These poor households also reported that they were less likely to buy books for their children (19% compared with 6%), more likely to restrict their children's participation in sports (23% compared with 13%), more likely to have their children sharing a bed with another sibling (11% as compared with 3%), unable to provide sufficient space for their children to study and play (24% as compared with 11%), unable to afford wet weather clothing for their children (15% compared with 4%) or able to afford adequate footwear (9% compared with 2%). There was also more likely to be an absence of toys in poorer families. For example 13% of poorer families reported that they could not afford a bike for their children compared with 5% of all other households.

The Geographic Divide

New Zealand's population is now growing only very slowly¹⁰. While we are isolated geographically from major trading partners, our population is also widely dispersed geographically with low density outside major metropolitan areas. This creates significant issues in terms of technical infrastructure, particularly with regard to band width and the availability and cost of technical support in many isolated and rural areas. This disadvantage is further overlaid in many communities by aspects of material disadvantage, and the absence of businesses and employment opportunities. These populations tend to be located in the northern half of the North Island, particularly in the East Coast and Northland, although the largest concentration of deprivation is found in Auckland and in Waikato.

As most people who currently access the internet do so through a landline telephone connection, the telephone penetration statistics give another picture of the disadvantage. Although the overall penetration rate of 96% is high in New Zealand (Statistics New Zealand 1998a), the figures reduce considerably for certain groups: 16% to 19% of Maori in Northland, Waikato, Bay of Plenty and Manawatu did not have access to a telephone. Overall 14% of Maori and 15% of Pacific people aged over 15 years lived in dwellings without a telephone.

People in rural areas also experience access problems with their telephones. Rural based submissions to Government prepared by Federated Farmers and Rural Women New Zealand (Maharey and Swain 2001) variously highlighted a range of problems they experience including overloading, fax problems, cell phone coverage, internet access difficulties including long delays, slow speeds and difficulties downloading.

A consequence of these patterns is that any solution to address the knowledge divide and e⁹literacy must acknowledge this complexity and the different contexts and backgrounds of these populations. The solution is not merely one of infrastructure. It will require significant investment in the range of small isolated communities and will require a complex array of approaches combining the efforts of central government, of business and the energy and drive of communities themselves.

Capturing the Diaspora

Migration has tended to have a relatively modest contribution to population growth over the past two decades, with net gains of migrants in the early 1970's and mid 1990's offset by losses during the later part of the 1970's, the mid to late 1980's and recently. While permanent and long -term losses tend to be higher among highly skilled people, there has continued to be a swap with similarly skilled people from other countries (Bushnell and Wai Kin Choy, 2001). This exchange however has two consequences. Firstly, it is resulting in a broadening of New Zealand's ethnic base with a concentration of net migration gain coming from Asia, and the Pacific, and net losses to Australia (Statistics New Zealand). Secondly, while the apparent skills of those leaving New Zealand are being replaced through immigration, this is not always being capitalised with many new migrants facing significant difficulty in being assimilated into New Zealand's productive base¹¹.

⁸ Defined here as housing-adjusted equivalent disposable incomes below 60% of median benchmarked to 1998 levels. This definition of low income is described in the Ministry of Social Policy's *Social Report 2001 EC3*. A full description of this threshold can be found in: Jensen & Krishnan (forthcoming).

⁹ Unpublished results Ministry of Social Policy.

¹⁰ Statistics New Zealand (2001), 1996 Base projections, assuming medium fertility, medium mortality and 5000 net annual migration, indicate that New Zealand's population will likely grow to 4.1 million by 2010.

Bridging the divide between Knowledge and Experience

Over the next two decades new entrants to the labour force are predicted to remain relatively stable in size and contribution. These groups have traditionally been the source of new skill and innovation into many areas of employment (Pole N, 1997) . The lack of growth in these groups will require increasing innovation and change to be captured from the existing workforce, and through lifting the skill level and concentration of skills of those entering into the labour force.

At the same time, given their younger age structure Maori and Pacific peoples will make up an progressively larger share of entrants to the labour force a trend which further underscores the importance of addressing the current under performance in achievements for these groups. This population will also be progressively relied on to support, an increasingly aged population both through contributions through taxation and through the supply of services. By 2051 the proportion of Maori in Aotearoa is predicted to increase to 22% and the Pacific Population to over 13%. At the same time the rest of the population (largely Pakeha) will decline from a 78% to 65% share (Statistics New Zealand 1998b).

An ageing workforce may become less resilient to technological change and the demands of a knowledge economy¹². An inability to continue to maintain pace with the requirement of changes in jobs may see older workers find it increasingly difficult to maintain employment with the risk of extended period of unemployment prior to retirement. Over the period 2001 to 2051, the proportion of older New Zealanders (aged 65 and over) are expected to more than double from 12% to 26% of the total population.

At the same time the increasing shift to knowledge based activities also provides an opportunity for older workers to continue to participate in work where in previous generations many older workers were limited by physical capacity. The nature of this work also facilitates opportunities for working at home, or working more limited hours.

While individual workers have an accountability for maintaining their skills, there is also a significant obligation here with regard to firms and employers to invest in maintaining the skills of their work force.

The range of data supplied here through a variety of sources identified particular groups, a large proportion of whose members are being left behind in the move to a knowledge society. They confirm the groups listed by the Government and noted earlier in this paper. As has also been noted, the majority of these groups are the same ones who were abandoned during the earlier restructuring of the mid-1980s and 1990s. They were abandoned in the sense that they were not adequately supported to up-skill and fully participate in the changing economy. As a consequence, their living conditions plummeted and this in turn was compounded by the withdrawal of social protection measures and the creation of higher levels of poverty.

We must not, and need not, repeat these historical policy mistakes. A fundamental shift in production from sole reliance on capital and labour to a major focus on innovation and knowledge is taking place globally. This has led to a much greater emphasis on education, skill, creativity and adaptability in the workforce. It has also led to a much higher reliance on technology in production and problem solving. As we have noted, many in the New Zealand workforce have not been adequately prepared for the change, and given the competitive global environment, they are increasingly at risk of becoming marginalised.

The size of the knowledge divide in Aotearoa, New Zealand provides a good indication of the level of social cohesion. The greater the divide, the greater will be the level of social exclusion and hence the lower levels of social cohesion. If the levels of social cohesion are low, then the democratic mandate to ride the knowledge wave will be greatly reduced. Furthermore, the critical pool of talent New Zealand desperately needs to compete internationally will be substantially reduced. It is no exaggeration to state that we will dangerously imbed the "two New Zealands scenario" of a group consisting of those who succeed and another faster growing group of those who are consigned to the margins and in many cases inter-generational poverty.

The new knowledge environment has special opportunities to be much more accessible to every New Zealand household and create greater equalities if the social, economic and political will is there. This 'will' must be supported by policy settings that are designed to achieve social cohesion during and beyond the transition. Opportunities to overcome the malign knowledge divide are already being taken by groups around the country,

¹¹ See results from Trlin's qualitative research which shows the underemployment of new migrants relative to their skills and experience (Bedford and Trlin 2000).

¹² The median age of New Zealand's population is expected to increase from 34 years in 2001 to 40 in 2021 and 45 by 2051. The proportion of the working age population aged 45 to 64 over this period increases from 34% in 2001 to 43% in 2051 (Statistics New Zealand, 2001 - assuming medium fertility, medium mortality and long term annual net migration of 5000).

and many of these are demonstrating successful outcomes. However, at present they are small and ad hoc. The opportunities they inspire and suggested policy settings to fast track many more of these types of responses are outlined in the next section of this paper.

THE OPPORTUNITIES CREATED BY THE KNOWLEDGE SOCIETY

Critical to success in the knowledge society will be our ability to learn in an ongoing way and to embrace a philosophy of lifelong learning. As this paper has shown thus far, those with few qualifications or who have achieved poorly at school are substantially at risk in this new economy. They may feel disenfranchised from learning and unaware of their ability to acquire knowledge if it is not presented within a flexible and relevant context. Providing that flexibility is a change which presents major challenges to the way in which education has traditionally operated, and one which will require innovation in education practices, systems and structures.

Through our education and training programmes we need to ensure students develop learning and critical thinking processes which will enable them to continually update and upgrade skills and understandings through their professional lives. This is particularly important in relation to the potential for rapid technological change and high levels of obsolescence within knowledge.

The need to address the requirements of less able learners becomes particularly important if a society is to respond to the needs of all its citizens and if it is to encourage all to achieve to their potential. Technology can play a substantive role through improving access to learning materials, providing computer assisted learning programmes, and tools to support assessment and to monitor cognitive processing by learners. Learning particularly of tacit skills, will remain a largely social process involving relationships among people (OECD 2000a:30).

A solid foundation in reading, writing and numeracy. A foundation in literacy and numeracy skills in the first years of a student's school life has been identified as critical to building this foundation. Parents and caregivers, too, have a part to play in the reinforcement of these skills, and this is being recognised through school-community based initiatives such as Feed the Mind and Te Mana.

In many cases as Dugald Scott (Principal Wellington College of Education) argues, the focus on literacy and numeracy requires schools to change their focus in terms of the curriculum they deliver in these early years rather than attempt explicitly to cover all subjects of the curriculum which has been the intent of the curriculum reforms of the past decade. An example he cites is Waterloo school Lower Hutt. This school has chosen to build its early programmes around these foundation skills, with less attention being given explicitly to other aspects of the curriculum. The result has been that students at this school are achieving in other subject domains to a greater extent in subsequent years¹³. The change has been partly recognised at a policy level in the revised National Administration Guidelines issued in 2000. This is a call for schools to give "priority to student achievement in literacy and numeracy, especially in years 1-4". However the point is not that schools should give priority to foundation skills of literacy and numeracy rather than to other curriculum areas. The point is that schools need to ensure that children acquire the foundation skills of literacy and numeracy in order for them to be successful in all curriculum areas.

The absence of teachers with skills and confidence in mathematics has been identified as another factor in contributing to New Zealand's students poorer performance in mathematics and science when compared internationally (IEA.TIMSS 1995).

Across OECD nations New Zealand performs particularly poorly in mathematics achievement at age 10. In comparison Korean and Japanese student scored significantly higher than all other countries participating in this study. New Zealand students however achieve a significant gain in their performance between age 10 and 14, although we continue to perform significantly below the OECD mean at age 14. In comparison with other countries New Zealand also has a long tail in which disproportionate number of students perform particularly badly when compared both nationally and internationally. By comparison countries such as Japan and Korea, appear to be able to get a much larger proportion of their student population gaining core skills in mathematics and sciences.

In addressing these concerns the "Numeracy Development Projects 2001", is being put in place to provide a comprehensive approach for the teaching of numeracy skills in our schools (Ministry of Education 2001). This project involves approximately 3100 teachers and 60,000 children. It aims to improve the performance of all students who are underachieving in Mathematics. This programme places a specific emphasis on early number learning, and is based on recent national and international research. It aligns assessment tools and resources, and ensures continuity between early childhood education and school and at various transition

¹³Personal communications – Dugald Scott; Wellington College of Education

points during school. Critical to the success of this programme is a comprehensive national professional development for teachers.

Knowledge management, and critical thinking skills. A major complexity with the new knowledge society is the huge range of information sources that are available. A key skill in this environment is the ability to search out knowledge critical to a particular problem, and assess the quality, value and credibility of this information.

These skills are particularly needed as a proliferation of digital content appears at New Zealand's door - much as encyclopedia salesmen did in the '50's and 60s - wishing to persuade teachers and learners that all the knowledge they will need is handily packaged within their commercial website.

Te Kete Ipurangi - the Online Learning Centre (www.tki.org.nz) is New Zealand's online community for schools which represents the nation's growing public domain collection for the education sector.

It is a response to the need to provide teachers and learners with a place to go – “First Stop TKI” – to access quality assured resources, materials, information and insights which have been assessed by education professionals as having relevance to class room teaching, student assessment, and student learning in New Zealand. TKI also includes special collections developed to support key initiatives, such as the National Certificate of Achievement (NCEA), as well as providing pathways to curriculum experts, education agencies working in the sector, and national and international sites.

An initiative of the Ministry of Education, TKI is a bilingual environment which offers support and materials in both English and Maori. Its first and foremost objective is that, in addition to the provision of information, it establishes a true online community that users contribute to, not just take from. Its choice of the kete as its symbol reflects that this is a place for **people** to come together, not just dry digital information.

The Learning Centre Trust of New Zealand has developed and manages Te Kete Ipurangi, on behalf of the Ministry of Education. Its thinking and approach to the development of TKI has been shaped by the insights and experiences of British educationalist, Professor Stephen Heppell, who heads Ultralab UK. Professor Heppell is an advisor to the Blair government and is a regular visitor to New Zealand.

He demonstrates, through the following chart, how a high value economy is shaped through a nation's adoption and use of the new technologies now on offer.

Winners & Losers	
Learning tools Standards Participative Contributing Creative	teaching machines standardisation “interactive” consuming predictable
= Cyber athlete high value economy cultural identity	= IT Couch potato low value economy imported culture

Professor Stephen Heppell, Ultralab UK, 2000 <http://www.ultralab.ac.uk>

TKI encourages active participation and contribution by teachers and learners in New Zealand through the provision of over 65 private e-learning communities within the site. Through these, groups of educators and teachers are collaborating and sharing in areas such as literacy and numeracy, schooling improvement, special education, distant communities and ICT. The e-learning communities provide participants with self-publishing web tools, forum and messageboard environments, list services, live chat and peer review opportunities to support resource development and professional development.

An example of an active e-learning community is the FarNet project. 10 secondary schools in Northland are working together to share knowledge and experience, with a particular focus on senior secondary science and mathematics. The schools are exploring how they might integrate the use of online technologies to support a virtual high school concept through which staff and students across all

The resources being developed in the sector, discoverable through the TKI metadata-based searching systems, are providing busy teachers with an efficient means to access high quality tested resources. Many of the resources being developed are highly interactive and present new ways in which to capture the imagination and creativity of students and their teachers. This project has also facilitated increased opportunities for partnerships internationally in terms of curriculum and materials development.

TKI was established as part of the ICT Strategy for Schools, released in 1998. The ICT Strategy initiated a programme aimed at developing the leadership skills of principals in planning school wide implementation of ICT.

A key role for TKI according to David Copeland, Chairman of the Learning Centre Trust of New Zealand, is to encourage participation and contribution by teachers as a part of their professional lives, and to ensure the credibility of the resource material described on this site¹⁴.

Ensuring equity of access to information for all schools is also a key focus and a core approach of the TKI strategy has been to develop initiative which support teachers in isolation, those working in schools with students at risk of educational failure, and in areas where there is a paucity of educational resources, as in the case of Maori language resources. TKI is also building tools which respond to the needs of the variously abled students and learners who use assistive technologies to access the Web so that they may effectively access and work through learning materials.

An example of an online collaborative study activity for students made possible through online media is one to be undertaken by students participating in the Notebook Valley project. Notebook Valley, a student-centred web community within TKI, includes an investigation of methane levels and demonstrates how a range of participants can work together. Data collected about methane levels are measured in Antarctica by a Scott Base technician who, in turns, provides this to a group of Otago University scientists.

The scientists then make these results available to students, via the Notebook Valley environment, so that they can discuss and analyse the data for themselves. Students are also able to contact Scott Base and the contributing scientists via the Web to further their findings.

Adult based training will be a key to the knowledge society. There has been little investment in New Zealand or internationally in understanding learning which takes place in the work place. For students who do not follow an academic path it will be critical to ensure that effective pathways into work are established, and that these are accompanied by on-the-job training and investment in skills. In Germany the integration between school and work-based learning are common place (Scott and Cockrill, 1998). Approaches which support the transition into work include mentoring by experienced practitioners, supporting learners to gain skills through experience and through experimentation.

In New Zealand, the newly established Modern Apprenticeships programme operated through Skill New Zealand provides education and training programme based in the workplace for young people aged 16 to 21 years. The distinctive features of Modern Apprenticeships include the use of a co-ordinator to support the young person and his/her employer during the apprenticeship to ensure the successful completion of the programme. Training is shaped to meet the needs of individual and includes both industry-specific and generic skills including communication, numeracy and information technology skills. To date evaluation of the Modern Apprenticeship pilot has provided positive results in terms of the outcomes for young New Zealanders in gaining skills, and highlighted the value of collaboration between Government and employers (Skill New Zealand, 2001).

¹⁴Personal communications - Jill Wilson and Dave Copeland; Learning Centre Trust

INFORMATION AND COMMUNICATION TECHNOLOGIES (ICT)

ICT is closely associated with the knowledge society. It is perhaps best viewed as an enabler, a very powerful enabler that both facilitates and transports knowledge. ICT by itself does not create transformations, but many people employ ICT to create them. ICT also carries ideas and can multiply the destinations, the presentations, the nuances and the people involved. Knowledge and technology overlap to create breakthroughs. These in turn create new knowledge and technological platforms that enable further innovations.

It has become clear that this process is at the heart of investment and growth strategies in the knowledge entrepreneurial countries of similar size to New Zealand, like Finland and Ireland. High tech industry as a percentage on Finland's GNP has increased fivefold in ten years supplanting the primary agricultural base. From a similar agricultural base, Ireland in one decade developed a thriving ICT industry to the extent that electronics and software exports made up 40% of their total exports (Information Technology Advisory Group 1999). These breakthroughs have created wealth and jobs in their respective economies, but this did not happen in an ad hoc manner.

The strategy of countries like the United States are in stark contrast to those in Finland and Ireland. In the US, despite the fact that their ICT breakthroughs are at the international cutting edge, the knowledge divide is substantial. Their economy has been extraordinarily robust in recent years, in no small part due to the high tech industries, but there has been no comprehensive policy to address social cohesion. The inequalities characteristic of the US social and economic policy mix have persisted despite the country's growth rate.

By contrast Finland from within a Scandinavian welfare state tradition, set up a "learning economy" approach. All students are exposed to ICT at a young age and computer literacy is a formal part of the national curriculum. Every school and college has fast web access via ISDN. They have been able to create wealth and social cohesion at the same time by ensuring every Fin has access and no one is left behind. Ireland, not coming from the same welfare state tradition, used the structural funds granted by the European Union, to invest heavily in education, particularly technical education for all its citizens. In the light of its success, Ireland continues its commitment to social cohesion by innovative and socially inclusive policies. Ireland today is the first member of the European Union to adopt a transparent poverty elimination target regime.

New knowledge and technologies can be employed to increase participation and reduce inequities in a manner that will enhance both the skill base and standard of living of all New Zealanders enabling us to reduce and, if we are clever and persistent, overcome the "divide". The Finish and Irish approaches offer constructive models from which Aotearoa, New Zealand can learn. There are a number of critical areas that are required to be addressed to achieve this goal.

Firstly, the technological infrastructure needs to be in place and access must be affordable for low income groups. As noted earlier, telecommunications systems in most urban areas of New Zealand are of a high standard. The same cannot be said of rural areas where people complain of overloading, slow speeds and long delays. These communities will remain disadvantaged if their internet access is frustrated by inadequate infrastructure that discourages learning, networking and business. They require greater line capacity, including the numbers of lines and greater bandwidth to prevent overloading and ensure faster access. Furthermore, in poorer rural areas, a substantial number of houses have no telephones. This is also the case for low income households in small towns and urban areas.

Many more households do not own a private computer. Only around a third of beneficiary and single parent households own a computer, for example. Affordable access for individuals is critical. This can be achieved in a number of ways:

- Ensuring and extending access for ICTs in public institutions, like libraries, schools, polytechnics, community houses and other local and regional government facilities
- Equity funding, subsidies and computer recycling for low income groups and others marginalised from the knowledge society.

Initiatives along these lines are taking place in New Zealand. Later in this paper brief descriptions of the Computers in Homes and the Community Computing projects will be provided as a base to extend ICT access. The former scheme has given 50 families from low income areas in New Zealand a computer, a phone line where necessary, Internet access, training and technician support. The latter provides free computing access and computing courses in polytechnics around the country.

Secondly, ICT skills and support must be made widely available and affordable to low income groups.

The investment in infrastructure will be squandered if users are not provided adequate skill and technical support. Once people have reliable access, they require experienced tutors who can up-skill and facilitate their ICT capacity and confidence with the new technologies. They require help to develop computer an internet literacy and then go on to use the technology to extend their education and knowledge.

The support needs to be user friendly in a manner that encourages a favourable attitude towards ICT. Related to this, people need help to explore the content that is relevant to their particular needs and understand the possibilities it can open up for them. These concepts are at the heart of the Computers in Homes and the Community Computing projects noted above where up-skilling and technician support is provided. Projects for specific groups can build on common interests and prove attractive to people. Smart Women Wellington, for example, is designed to bridge the gender digital divide and reduce the trend of the “feminisation of poverty”. They address computer and ICT training for women in differing situations and with differing needs eg women at home and women returning to the workforce.

Thirdly, ICT can support and encourage community learning and involvement. The new technologies are highly flexible and easy to transport. E-learning can be delivered anywhere and at anytime. This means it can be accessed by people who, either cannot or do not want to take courses in traditional educational settings. E-learning can be easily delivered to remote areas, to poorer areas without good tertiary institutions, after working hours and in learning formats that are directly relevant to the user. Individual or collaborative learning settings can be used and progress can be monitored in timeframes that are suitable for the learner. Where people cannot afford university courses, cannot afford to give up full-time work or have been alienated from traditional learning settings, the new technologies, if made available, can offer new starts, new learning and up-skilling possibilities enabling a speedy acquisition of knowledge in a manner that was not previously available.

The Smart Newtown Pilot Project exemplifies this very well. The Wellington City Council and 2020 Communications Trust are working in partnership to grow smart communities with supported access and skills that are able to participate in the digital knowledge economy. They consider that this is a critical success factor for Wellington’s development as a “Smart City”. The vision for the Smart Newtown Pilot project is to create a community where all residents have the skills and access to become active participants in the on-line world. Newtown area was chosen to develop the pilot community model, because of its diverse needs, breadth of ethnic groups, corridor of educational institutions, geographic closeness of participating institutions, and accessibility to broadband Internet connection.

The Newtown Pilot Project seeks to address, support and encourage community involvement, in young people and families through:

- Developing skill levels amongst disadvantaged groups to improve their future contribution to the economy and widen the employment opportunities open to them
- Supporting access to computers and the Internet
- Equipping families with essential skills relevant to the workforce
- Providing a safe, relevant and exciting environment that encourages the adoption of ICT skills
- Encouraging learning, personal and community development
- Opportunities to participate in e-government and e-business
- Accessing information about current affairs and key issues in families country of origin
- Enabling learners to in turn become the trainers.

The initiative is a pilot and will be evaluated based on research conducted by Massey University and Victoria University and monitoring conducted by the Economic Development Unit of Wellington City Council and the 2020 Communications Trust.

The Newtown Project aims are:

- High Speed Internet and computer access in strategic public places (schools, library, community centres)
- All community groups with a home page on Wellington Community Net
- Community based computer/Internet training
- A vehicle for exploring cultural diversity
- Opportunity for the Newtown school teachers to participate in computer networks and hub activities
- Every cultural group able to access information on their home country so they can explore their own culture and the culture of other community members
- Newtown community and educational institutions able to pilot and test new educational multimedia products
- Links between IT focused business clusters and this project.

The pilot project will commence with three sub-projects.

- Educational Development - Newtown School Computers in Home Project. To improve the ICT capability at Newtown Primary School, so that it can become a hub for the community. To offer families supported access and training to information and communication technologies
- Community Development - Newtown Community Centre Computer Centre and Newtown Library Partnership. To provide to the community access and support to Information Communication

Technologies at the Newtown Community Centre. To promote and develop further activities and relationships between the library and the community

- Business Partnership Programme - Fujitsu WCC Newtown Park Flats Computer Centre. To provide opportunities for Wellington City Council Newtown Park tenants to access information technology for education, training, communication, day-to-day business transactions and entertainment. Fujitsu will supply recycled PCs, a Citrix server with Microsoft Office and free Internet access installed in an existing dedicated computer room, support via their Helpdesk and first level support being provided by one of 5 selected and trained personnel from the N/Flats.

Fourthly, ICT can help cultural groups develop and control up-skilling and business projects. The new technologies can be used and controlled by particular groups in a manner that was less possible in the past. Maori, for example, have already initiated capacity building programmes that relate to whanau, hapu and iwi management and development. Maori language, Maori symbols and Maori learning styles can be the medium of teaching and learning. It is now possible for people to control and market products from their iwi base. ICT can be used to help develop tourist enterprises, product development and artistic endeavour from any geographic point.

Te Wananga O Raukawa (www.twor-otaki.ac.nz) has a project to encourage access to information technology by its students. Computers, training and follow up support are provided to all students and staff. In 2000, 500 students assisted with computers, printers, selected software and internet connectivity. The Wananga was awarded the top Crown entity award for innovation in 2000.

Te Runanga O Te Whanau has established a Cisco Networking Academy in Te Kaha to teach local Maori IT training. Called Cyberwaka Enterprises (www.cisco.com look for cyberwaka), young Maori around the eastern Bay of Plenty are now able to take part in the Cisco Networking Academy programme. The Cisco programme is an interactive, multimedia, self-paced, web-based curriculum, which allows students to gain industry-recognised qualifications for the computer networking field. The programme is based in a disused school building at Te Kaha.

Manukau Urban Maori Authority - has established its own community computer hub in its offices in South Auckland. 'Cyber Tek' was established to provide a base for Maori in South Auckland to gain computer skills so as to increase employment opportunities. Training is provided in accordance with the NZQA unit standard. Most of the clients come from the Department of Work and Income through contractual arrangements and include many non-Maori.

Fifthly, social capital investment into a wide range of communities through ICT can help bridge the knowledge divide. The programmes need to be user friendly, community affirming and enable participation in the knowledge society. Communities of different types will require their own design and support personnel who can help develop programmes that will give broad confidence to members of those communities, like the Smart Newtown Project. Prose, quantitative and computer literacy, which has become even more important in an information age, can be addressed through community based e-literacy programmes. Such programmes can be harnessed to empower people and groups currently marginalised from the mainstream.

The Computers in Homes project was launched at Cannons Creek School, Porirua and at Panmure Bridge in Auckland during the middle of 2000. The project aimed to empower the communities of decile 1 (low socio-economic) schools with the tools and skills to become active participants in online activities. The scheme gave 50 families in New Zealand a computer, a phone line where necessary, Internet access, training and technician support. The families signed an agreement and paid \$50 dollars to take part in the programme. The major objectives were to provide parents with computer skills and to encourage children to use these new technologies as a learning tool.

In Porirua the school has upgraded its school website (<http://sites.tki.org.nz/cannonscreek>) to include online resources for pupils to use for homework, targeting literacy and numeracy skills. Cannons Creek School will shortly have a Cyber Study Center with funding provided by the Ministry of Education under the School Study Centre initiative. The school will employ a part time Cyber Teacher to set assignments via the Web site and mark homework via email.

In Panmure there are six family coordinators who act as mentors to four/five families and provide assistance to them. The Auckland project also includes eight Tongan families and some of these families, through a link formed with the Tongan Tu Pou high school, are contacting their families in Tonga. The school is offering training and Internet access to the relatives of their families in Tonga and this is expected to promote more contact with the families.

The results from the first evaluative follow up were very positive. Almost all the parents were using email, and websites for news and information, like job vacancies. Some also used the internet for shopping and banking. Half the Canon's Creek parents used the school website for a variety of purposes. Parents and children played computer games together. Half the parents taught their children skills on the computer and the other half learnt skills from their children. The children reported emailing and using the websites.

"Everything about the computer is new and interesting to me especially because I have ever in my whole life ever learnt to use one. I have never ever used a typewriter. Now you wouldn't believe how good I can type. I can also touch type. My kids are learning to touch type as well. The interesting thing about the computer is my kids love doing their homework"
Computers in Homes Mother of Three

The Community Computing project at Whitireia Polytechnic enrolled nearly 1,500 people in its first six months. They offer 20 hours free access for each module available. These include word processing, spreadsheets, Microsoft Publisher, Power Point, the Internet and email, and key-boarding. Every participant has access to a workstation where they can work at their own pace. Help is available from a Help Desk Assistant. There is no assessment or exams. These courses are now available in Polytechnics throughout the country.

Sixthly, supportive pathways need to be developed that enable people of low ICT skill to move from low level employment, as in a call centre for example, to higher level ICT skills, like programming. In a knowledge society, skill development should bring its own rewards and empowerment. It is important not to leave currently marginalised groups stranded at the lower repetitive levels of ICT, but rather allow each stage of learning to encourage confidence in the acquisition of new competency. Employers need encouragement to provide up-skilling opportunities for employees in a knowledge society. This will not only lift the capacity of the business but will also contribute to the retention of staff.

THE PATH TO SOCIAL COHESION: RECOMMENDATIONS

Investment In Our Number One Asset : People

A key conclusion from the analysis presented in this paper is that skills in cognitive processing, literacy, numeracy and ICT, are crucial to individual effectiveness and participation in a knowledge based society. This will require that we raise the overall level of skill across the population, but particularly among those who have tended to underachieve in the formal education system.

Critical to this will be:

Early Childhood Education

- Actively involving parents and families in their children's development and providing parents with the skills to ensure ongoing nurturing and development at home¹⁵
- While Te Whariki (the early childhood curriculum) has provided a unifying approach to learning throughout the early child hood sector, large numbers of children fail to fully participate in early childhood education. This must be addressed
- Key to improving learning outcomes will be investment in high quality, affordable early childhood education, particularly targeted to areas of disadvantage
- A key element of quality will be increasing the availability and qualifications of early childhood teachers working in these programmes.

Improving our Schools & post school effort

- The establishment of comprehensive programmes in our schools to ensure all students gain: fundamental skills in literacy, numeracy, logic, critical thinking and in the use of information technology while at the same time fostering creativity, curiosity and a sense of cultural identity
- A commitment to the development of curriculum resources which express our "New Zealandness" and cultural uniqueness
- Investment in technology and resources to support access by all schools, but particularly low decile schools, to high quality education programmes
- To lift the educational outcomes for Maori and Pacific students to equivalence of those of Pakeha students
- Promotion of maths, science and technology options in the senior school, and in universities.

¹⁵ Examples of initiatives in this area already exist in *Family Start* and *Strengthening Families* and programmes such as the "Feed the Mind" campaign.

Lifelong learning

- Providing opportunities for less able students to gain skills and pathways into work
- The development of a workforce actively involved in maintaining and developing their skills throughout their careers
- The provision of support for people who wish to change or upgrade their careers during their working life
- The development of opportunities for those who have under-achieved through their school careers to gain access to basic skills in the workplace
- A commitment by employers and businesses to investing in the ongoing training of their employees.

Building Cultural Capacity

- Resourcing Maori and Pacific initiatives in the knowledge society that promote identity and innovation in education, ICT, the arts, business and policy development
- Encouraging leading edge knowledge development in areas of critical interest like arts and design, forestry, fisheries, tourism, sport and entertainment
- Investing in Maori and Pacific education, ICT and innovation capacity building in a manner that builds skills and unlocks creativity for all ages and educational levels
- Ensuring the current educational and ICT disadvantage is overcome
- Ensuring the protection of indigenous rights, tikanga and cultural control in the development of knowledge.

Recognising the talent of new New Zealanders

- Ensuring wide public understanding and acceptance of religious and cultural diversity through, school based programmes and positive portrayal of these groups through the media
- Addressing the training needs of new migrants through employers and professional organisations, in order to ensure more effective assimilation into the economy of the skills and talents these individuals bring to New Zealand.

Research

- Investment in research into the impacts of social, economic demographic and technological change on the population, and into the types of social programmes that work in addressing disadvantage and underachievement and which document and celebrate our achievements
- Investment in research into the development of programmes which effectively address the learning needs and learning styles of students at risk of educational failure along the lines noted above
- Improved monitoring of educational effectiveness and outcomes and a commitment to tackling the causes of disadvantage.

Business, Government and Community Partnerships

- Encouraging creative entrepreneurial initiatives between different sectors to facilitate the acquisition of skills and the creation of knowledge among those who have been left behind
- Setting up business and government joint funding and joint venture knowledge projects that resource communities who experience marginalisation, to participate fully in the knowledge society
- Encouraging wide ranging business and government partnerships in employment, training, up-skilling and vocational paths particularly for those communities that are currently disadvantaged
- Ensuring community and cultural groups have control over the development of their knowledge in joint funding and joint venture projects.

INVESTMENT IN INFORMATION AND COMMUNICATION TECHNOLOGY FOR ALL

ICT can be employed as a vehicle of social cohesion to increase participation and reduce inequalities in a manner that enhances both the skill base and standard of living of all. For this to happen, Aotearoa, New Zealand has to become a world leader in the international knowledge community. This in turn requires a major investment in ICT for all.

Critical to this will be:

Infrastructure

- The new technologies must be easily accessible and affordable for all New Zealanders, and particularly those who are currently marginalised from them.
- Investment is required to build on and extend the country's information and communication infrastructure, including telecommunication access paths, internet hosts and broad bandwidth, to ensure it is continuously at the highest standard.
- All New Zealanders of school age and older need liberal access to telephone connections, computers, and internet connections whether they are poor, live in a rural area, young or old.

Investment

- Investment in public institutions like schools, polytechnics, libraries and community centres so they are able to provide wide ICT access.
- Schemes need to be set up to make recycled computers available for low income families.
- Telephone and internet connections need to be affordable or provided for low income households.

Support

- Investment to make widespread technical and ICT learning support easily available to low income and other marginalised groups.
- People from the cultural, gender, age group or regional communities of those currently at risk of missing out on the benefits of the knowledge society, need to be trained as technical support staff.
- Support work needs to be user friendly and aimed initially at building confidence particularly with people who have not succeeded in the formal education system.
- There is a need for pathways of support that will enable beginners to build ICT capacity and push to new levels of competence. This needs to occur in public institutions, community settings and in the workplace.

Facilitating cultural groups and communities of interest

- Investing in cultural or special interest groups development of ICT initiatives for learning, developing knowledge, design and business in their particular milieu. These groups can create new symbolic knowledge that can become marketable and certainly helps lift the game for others in their community. A consequence will be to develop curiosity, experimentation and innovation in the use of ICT in areas of relevance for those communities.

LEADERSHIP, STRATEGY AND INVESTMENT

In Aotearoa, New Zealand, there is now an increasing agreement developing between Government and many in the business community, academia, trade unions and NGOs that we should commit ourselves vigorously to becoming a leading edge knowledge society. This creates an environment for innovative policy and investment in this area.

New Zealand cannot afford to repeat earlier mistakes by simply backing certain entrepreneurial leaders in this area. They will certainly need support, but the country's well-being depends on the participation of the whole society. The lower performers need to be lifted towards the average and the average needs to be lifted towards the top. The goal should be to maximise participation and achievement in the knowledge society in order to increase the benefits for all New Zealanders and to enable the full range of kiwi talents develop our future innovatively.

Policies to accelerate participation and change in this area must cover the full spectrum of our society. They must be multi-layered so those with the least access and least understanding are fast tracked. They must harness the wasted potential, particularly those communities and people currently deprived from participation. At the same time policies must enhance opportunities for those who can fast track and excel in the new age to become international leaders. They must build on the innovative spirit in the New Zealand psyche.

In this regard, the three pillars of the policy framework are access, understanding and application.

Currently in Aotearoa, New Zealand there are a range of creative, innovative and exciting knowledge projects that are bridging the divide. Most of them are small and few co-ordinate with other areas to provide adequate coverage. There is a need for an holistic Government approach to support and build on the trail blazing work of these inspiring projects. Leadership and investment in knowledge and ICT that will reach all communities, is required to open pathways to platforms of knowledge. This will begin to close the divide and enhance social cohesion.

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