The next big th#ng?

A history of educational computing policy for New Zealand schools 1960-2004

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Who controls the past commands the future. Who commands the future conquers the past.

George Orwell

Contents

Tables

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Foreword

Computers have helped to transform our lives. Computers are at the centre of the 'knowledge-age' and the way our society now communicates, stores and analyses diverse masses of information. Computers are now integrated into an enormous number of day-to-day technological devices. They provide powerful research and analysis tools with professionals in such varied fields as medicine, music, sports and design now using computers in an array of new projects. Computers have even been instrumental in the research and preparation of this thesis.

While computer technology has made numerous positive contributions to our society, there are also instances where they have not added to the general good. What has become apparent is that among the benefits brought by computers, there are also more complex social realities into the bargain. Computers don't just deliver technical solutions; they change the way people carry out certain tasks and they also create new sorts of activities. Computers are cultural devices operating within a social context and they can affect, or fail to affect, social situations in a variety of predictable and unpredictable ways.[1]

With the introduction of computers into classrooms, powerful technological tools have become available for teaching and learning. In today's classrooms we can variously send or receive information; manipulate or develop text, audio and video imagery; we can also instantly communicate with experts, students and teachers from across the planet. Despite this, a range of negative social/technological interactions have developed. It is also apparent that, as of 2006, computers have yet to transform classrooms in the same ways they have affected some other domains. Schools and classrooms across the world may have

[1] H. Bromley (1998). Introduction: Data Driven Democracy? Social Assessment of Educational Computing. In H. Bromley and M. W. Apple *Education/Technology/Power: Educational Computing as a Social Practice*. New York: SUNY Press.

introduced computers, but the overall result for education and student learning has been far from revolutionary.[2]

Understanding why computers have so often failed to deliver their promised benefits to education brings us back to concepts such as educational change, social context and 'people effects'.[3] Educational change occurs in a dynamic and complex social environment. This complexity has not been well understood in New Zealand's educational computing policy. The result has been a simplification of the potential of computers in education. It is an overarching aim of this research to disentangle such simplistic approaches and provide insight into the rationales and processes that have helped construct educational computing policy.

This thesis is not pro- or anti- computers and it does not deny that computers can make a powerful contribution to teaching and learning. In exploring the complexity and social dynamics surrounding educational computing policy, this thesis attempts to provide an informed basis for future educational computing policy. It seeks to understand the past and build a discussion about educational computing policy which leads to better, more humane, ways for governments to support the carefully considered use of computers in schools.

Robert Stratford, August 2006.

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[2] See for instance L. Cuban (2001). *Oversold and underused: computers in the classroom.* Cambridge, Mass: Harvard University Press.

[3] K. Ryba (1989). An ecological perspective on computers in special education. In R.I. Brown and M. Chazen (Eds). *Learning with computers and emotional problems.* Calgary: Detselig Enterprises.

Chapter One

Introduction

In 1971 Christ's College became the first New Zealand school to own a computer. The PDP 8e processor from the Digital Equipment Corporation came with "4k of core memory, together with an ASR 33 teletype and paper-tape reader and punch". Once upgraded to 8k of core memory, the PDP 8e cost Christ's College around $8,000. The money for this project was anonymously donated to the school.[1]

The PDP 8e did not change the nature of learning at Christ's College.[2] Neither did the PDP 8e make significant headlines in the Christchurch newspapers. The PDP 8e joined the five electronic calculators in the mathematics laboratory, where it was apparently well utilised, by predominantly senior students, on mathematics and computer programming problems.[3] Christ's College's historian, ex-deputy principal Don Hamilton, was reticent about this first step in New Zealand's educational computing, while offering a laconic insight into the technological future of Christ's College.

> From that modest beginning the computer empire began an expansion that will never end.[4]

Don Hamilton wrote his history of Christ's College in 1996. As a long-serving staff member, Hamilton observed the development of educational computing at Christ's College over twenty-five years. While this development was not an important aspect of his history, he briefly discusses two other historical events involving computers at the school. The first of these was the development of Christ's College's Macintosh network in 1993. According to Hamilton, it was the largest such network in the country at the time and cost $500,000. The second event, was in 1985, and involved a boy who had received "three strokes

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[1] A.R.D. Ramsay (1975). A computer in school. *Education* 24 (2) pp8-10.
[2] Ibid
[3] Ibid
[4] D. Hamilton (1996). *College! A history of Christ's College.* Christchurch pp694.

from a master for ...instructing a computer to perform an indecent act, of which it was physically incapable".[5]

Christ's College is different to most New Zealand schools. Christ's College is a well-resourced Boys' secondary school with a reverence for the English public school system[6] and a traditional, academic approach to education. In many ways the purchase of the PDP 8e by Christ's College is a symbolic introduction to New Zealand's educational computing policy. Christ's College have, in the first instance, spent a considerable amount of money on computers. Not all New Zealand schools have been able to meet the costs of computer technology and this point of difference helps to introduce the idea that money and finance have been a key aspect of educational computing in New Zealand.

Hamilton's observation about the expansion of computers of Christ's College also introduces the ideas about the growth of computer technology in education. Computers have become an increasingly common aspect of schooling. They have also been frequently accompanied by revolutionary promises about potential improvements in teaching and learning. In this manner computers have become one of the 'big things' in education, and, as the laconic tone of Hamilton implies, this growing popularity seems to be an inevitable aspect of the future.

The tale of the unfortunate boy in 1985, also helps to emphasise that the use of computers is linked to the surrounding social and political context. The behaviour of the boy, and his subsequent punishment, reflect a dynamic between his own background, the classroom and the norms of the school. Understanding such technology-based social situations requires a critical appreciation of the wider social and political context. Presumably the computer did not singularly make this particular boy misbehave – although it did provide him with the medium for a new form of rebellion.

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[5] Hamilton, 1996; pp694.
[6] For instance fagging was only stopped in 1987 (Hamilton, 1996).

Similarly, in understanding the reasons behind particular educational computing policies, an approach is required which seeks to deeply and critically understand the social and political context. The critical understanding in this thesis comes from uncovering the important rationales, ideas around educational computing policy. It comes from understanding the policy process as part of a dynamic and competitive environment involving a complex mix of technology, political events, values, ideas and points of view. In simple terms, the approach of this thesis attempts to get under the surface and provide a big picture understanding. It is an approach which eschews the received versions of the past, or the acceptance of political rationales at face value, and presents a history of educational computing policy that can help explain 'why' and 'how' certain policies developed and not just 'what' has constituted these policies.

The key questions for this thesis

The critical approach adopted in this thesis towards computers and education is not common. Since the origins of educational computing, much of the discussion about educational computing, both in New Zealand and internationally, has tended to focus on the positive educational 'possibilities' provided by educational technology, rather than the complex realities. While there have been some international educators who have critiqued aspects of educational computing policy,[7] there has yet to be a critical history of educational computing policy in any Western country.

Given the investment that occurs in educational technology, both in New Zealand and overseas, then thoughtful consideration of this area is overdue. In New Zealand, over 80% of classrooms have had at least one computer since 2000.[8] These computers have usually been purchased by schools directly,[9] through fundraising and parental contributions, although from 1999 onwards

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[7] N. Selwyn (2004). Rethinking the 'computers-in-schools' policy cycle. *Computers in New Zealand Schools* 16 (2) pp8-12, 17; L. Cuban (2001). *Oversold and underused: computers in the classroom.* Cambridge, Mass. Harvard University Press.

[8] Education Review Office (2001). *The Implementation of Information and Communication Technologies (ICT). in New Zealand Schools 2001.* Wellington.

[9] While it is difficult to know how much schools themselves have spent on computers in any given year, the worth of the computers in schools can be estimated. Given that there were approximately 730,000 students in schools in 2000, and that there was approximately 1 computer for every 12 students, then it can be estimated that approximately $50 million worth of computers were in New Zealand schools in that year.

there have been significant financial commitments for educational computing from the New Zealand government. In the years form 1999/2000 to 2002/2003 the New Zealand government spent $127.9 million on initiatives connected to its Information and Communication Technology (ICT) strategies for schools.[10] From 2004 onwards, the New Zealand government has committed $60 million per annum to ICT initiatives for schools. The Microsoft licensing deal alone will cost the New Zealand government $27.45 million for the 2004/5-2007/8 financial years.[11] ICT has also been expensive for New Zealand business too. As an example, during the 1990s Telecom New Zealand put approximately $80 million into New Zealand schools.[12]

For all that New Zealand government and business spending on computers may appear significant to a New Zealand audience, in the year 2000 alone, the United States Federal government spent $US 6.7 billion on school computers.[13] Todd Oppenheimer has estimated that between 1993 and 2003 American Schools spent approximately $US 80 billion on computers.[14] Other OECD countries have also spent a considerable proportion of educational expenditure on computers and their associated technologies[15] and in this sense, the findings of this thesis may be relevant, not only to those interested in how the New Zealand government has responded to educational computing, but also to those countries attempting to understand how their educational technology policy has developed.

The world-wide expenditure on educational computing draws attention to the global context in which educational computing operates. On one level

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[10] Source figures provided by the Ministry of Education.
[11] T. Mallard (2003). *Schools to receive Microsoft software at no cost.* Beehive press release 20 April 2004 as sourced 14 November 2005 from http://www.beehive.govt.nz/ViewDocument.aspx?DocumentID=19472.
[12] Source figures provided by the Ministry of Education.
[13] Sourced 3 April 2004 from Freedom works website http://www.empoweramerica.org/stories/storyReader$55.
[14] T. Oppenheimer (2003). *Computers are dumbing down our schools and kids* as sourced from http://reclaimdemocracy.org/weekly_2003/computers_dumbingdown_kids.html 9 April 2003. This figure does not include the investments of corporations such as Microsoft and Hewlett Packard.
[15] $US 16 billion total for 1999 as sourced from UNESCO website 24 July 2005 http://portal.unesco.org/education/en/ev.php-URL_ID=23503&URL_DO=DO_PRINTPAGE&URL_SECTION=201.html.

computers and information technology have been at the forefront of 'globalisation'.[16] The capabilities afforded by the internet, satellites and telecommunications have enabled money, information and ideas to travel instantly around the world. Globalisation has also been implicated in environmental damage, threats to indigenous cultures and a loss of national sovereignty. These issues should not limit our interpretation of globalisation, and, as is the case with computers, we cannot simplify globalisation as good, bad or neutral. Globalisation represents a set of processes where social and political structures are rapidly being modified for outcomes that are good, bad and indifferent.

The relationship between globalisation and technology provides an important background to the research questions of this thesis. Whatever critical questions could be asked about New Zealand's educational computing policy, 'what is happening globally' has often been important in understanding educational computing policy in this country. In the following chapters there are many examples of where global links are discussed in relation to the New Zealand policy context. For example, New Zealand, along with many other OECD countries, has tended to compare its economic performance with that of other countries, and then used this comparison to justify, in part, the need to teach computer skills. New Zealand has also examined the educational computing policies of other OECD countries and seen the need to create economic and educational policy decisions that keep New Zealand up to date.[17]

Within this background, the following questions have been developed for this thesis. These questions provide a basis for describing and understanding the main events in New Zealand's educational computing policy. They provide a framework for the analysis of the forces, personnel, language and ideas that have created and altered, the educational computing context.

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[16] See also N.C. Burbules and C.A. Torres. (2000). *Globalization and Education*. New York, London: Routledge.

[17] See also H. Bromley (1998). Introduction: Data Driven Democracy? Social Assessment of Educational Computing. *Education/Technology/Power: Educational Computing as a Social Practice*. Ed. Hank Bromley and Michel W. Apple. SUNY Press.

1. What have been the New Zealand government's significant educational computing policies for schools between 1960 and 2004?

2. What ideologies, discourses and rationales have helped structure the New Zealand government's approach to educational computing policies between 1960-2004?

3. What, if any, are the major themes, patterns or ideas to emerge from a critical analysis of the history of the educational computing policies for New Zealand schools?

4. What can a focus on New Zealand's educational computer policies for schools tell us about the development of educational policy?

The ideas behind these questions are linked to the literature of educational computing, educational policy, the policy process and the role of the state in forming education policy. This includes a discussion of New Zealand's history and the relationships between the important patterns in society and how they have impacted on educational computing policy.

The scope, limits and methods of this research

This thesis is focused on the New Zealand government's 'learning-based' policies for computers in primary and secondary schools. It discusses the educational computing policies for 'learning with', and 'learning about' computers in schools. This thesis does not discuss New Zealand's policy approach for computers in early childhood settings, tertiary education, special education and educational administration.

Government policies and processes for educational television, or video resources are also not widely discussed in this thesis – except where educational computing is incorporated with terms and policies that refer to a broader range of educational technologies. The term 'educational technology' is the preferred term to refer to such equipment as computers, televisions, radios, electronic musical instruments, faxes and so on.[18] Two major instances exist in New Zealand policy making, where educational computing has been commonly incorporated with other sorts of educational technologies. 'Information

[18] M.E. Brown (2000). Guest editorial learning in the 21st Century: Being Critical, going deeper and thinking smarter. *Computers in New Zealand schools* 12 (3), pp3-7.

Technology' is the favoured term in New Zealand policy circles from the late 1980s to the mid-1990s, and 'Information and Communications Technology' has been preferred from about 1995 to the time of writing. As a result, these terms, and the concepts they are derived from, are discussed alongside educational computing and educational technology where they have arisen. In general the terms Information Technology and Information and Communications Technology are used as they relate directly to government policy, whereas educational computing and educational technology are used to describe the equipment directly.

A number of areas related to educational computing are not emphasised because they are significant research projects of their own, and a particular focus on these issues would compete for space with arguments about the government's overall policy approach to educational computing. Senior secondary school computing courses, educational computing in Maori-medium schools, the development of technological infrastructure and details of distance education are often connected or overlap with the government's overall policy approach to educational computing, but, rather than as specific topics or strands within this thesis, they are discussed only within the context of the mainstream educational computing policy approaches of the government. It is the focus on educational computing policies in mainstream compulsory education that is used in this thesis. Further research in these related areas can look to build on this thesis's discussion of the government's educational computing policies.

It is also beyond the scope of this thesis to discuss the variety of ways in which different schools and teachers might have made exceptional and idiosyncratic adaptations with educational computers to what the government might have intended. This would be a valuable area for contemporary and historical research, but its inclusion here would have inhibited the preparation of an in-depth critical thesis on educational policy.

This thesis has also covered a considerable range of events. Much of this information has been closely considered for the first time. In this sense there are numerous examples where more detailed work is possible. *Chapters Five, Six*

and Seven for instance involve events that have complex dynamics and, in short, a large number of moving parts. Not all the information gathered for these chapters was presented in these chapters and greater detail could be provided by research directed solely at events within these chapters.

This thesis has used predominantly documentary sources of evidence. Survey data, teacher writings, newsletters and journal articles have helped to reveal, in a generalised manner, how educators have responded to the changing policy dynamic around educational computing. Documentation has also been gathered from the educational computing policy context. Material from Archives New Zealand has been especially useful in establishing the details of the first three chronological chapters. Official Information requests and various forms of support from the staff at the Ministry of Education, Ministry of Commerce and Treasury has been useful in gathering information for the last three chapters.

There were no interviews carried out for this research. In some ways the lack of interviews within this research has made it difficult to develop a complete picture of how individual personalities have operated within the decision-making context. An understanding of the personal subjectivities at work around a policy may have helped explain in more detail the personal rationales, ideologies and discourses that have informed any particular decision. For instance interviews may have been especially important in elucidating those policy situations where personal relationships, and individual agendas have particularly influenced a decision of the State. Such interview data would have also carried its own research risks and on balance the absence of specific interview data, has not prevented this thesis from developing a well evidenced discussion of the rationales and events underpinning policy making based on the documentary sources available.

Educational computing policy 1960-2004

One of the aims of this thesis is to produce an accessible narrative to a wide audience of academics, educators and policy-makers. As a result, this thesis uses a chronological, rather than thematic, structure to the history of New Zealand's educational computing policy. While *Chapter Two* and *Chapter*

Three provide details about the thematic and methodological aspects of this work, the subsequent five chapters each discuss a period in the history of New Zealand's educational computing policy. The final chapter of this thesis provides a conclusion for this thesis. This section introduces the key events discussed in the chronological chapters and provides the reader with a ready overview of New Zealand's educational computing policy and a sense of the structure and nature of the events.

The first chronological or narrative chapter of this thesis is *Chapter Four - From 'new maths' to first contact (1960-1979).* This chapter begins in 1960, 11 years before the installation of Christ's College's PDP 8e. 1960 represents a time before any schools had used a computer and before there was any government policy on computers in schools. Indeed it was not until the late 1960s that several secondary schools had introduced some form of computing. While these first uses of computers in schools are outlined, this chapter concentrates on the educational and political context of educational computing policy. It describes a number of relevant policy events of this time including: the Currie Commission; the Education Development Conference; the installation of the first computer in New Zealand; Britain's entrance to the European market; and the oil shocks of the 1970s. *Chapter Four* covers the longest time period of any of the chapters and brings the narrative through to the late 1970s, the development of the micro-computer and the government's first substantial policy position on educational computing.

The dominant policy and pedagogical principles between 1960 and 1979 were those connected with a liberal-progressive approach. Such an approach to education has its origins in the work of Dewey. In New Zealand such an approach has been concerned with the development of a broad general education, egalitarianism and equality of opportunity.[19] The rhetoric of this position is well known to those familiar with the work of Peter Fraser and

[19] M. Olssen and K. Morris Matthews (1997). Introduction. In M. Olssen and K. Morris Matthews, (Eds) *Education policy in New Zealand: the 1990s and beyond.* Palmerston North: Dunmore Press.

Clarence Beeby. In 1939 Fraser stated that, amongst a broad general education, a student should be educated "to the fullest extent of his powers".

> The government's objective, broadly expressed, is that every person, whatever his level of academic ability, whether he be rich or poor, whether he live in town or country, has a right, as a citizen, to a free education of the kind to which he is best fitted, and to the fullest extent of his powers.[20]

The educational philosophy of Fraser and Beeby dominated New Zealand education policy from the post-war period to the 1980s. It was not the sole approach however, and the other approaches to over this period include a conservative 'back to basics' approach as well as several economic and vocational conceptions of education. These different approaches to education brought a different set of assumptions to education, and later educational computing.

The development of the 'new maths' movement during this period provides a useful introduction to the ideological context entered into by educational computing. New maths was an educational innovation with links back to United States educational anxiety over the Russian launch of the Sputnik satellite. At the time new maths was being introduced, New Zealand was beginning to face its own anxieties with oil shocks and Britain's admission to the European market, casting doubt on the future success of the New Zealand economy. The development of economic and/or vocational skills-based ideas around both new maths, and later computers, provides a point of comparison for later approaches drawing on a skills-based educational philosophy aimed at overcoming economic uncertainties - an approach that has become more dominant for both education, and educational computing policy since the 1980s.

In contrast to the near 20-year period of *Chapter Four*, *Chapter Five - 'Thinking big' - the consultative committee and the Poly computer (1980-1984)*, spans the shortest time period in of this thesis. The short time period of this chapter reflects the complexity of events surrounding the Poly computer and the

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[20] J.D. Marshall (1997). *The new vocationalism.* In M. Olssen and K. Morris Matthews, (Eds) *Education policy in New Zealand: the 1990s and beyond.* Palmerston North: Dunmore Press.

Consultative Committee on computers in schools.[21] From a period of relative in-action during the 1970s, the Education Department, and Merv Wellington as Minister of Education, were at the centre of the National government's aim for New Zealand to become a leader in the global educational computer market. The consultative committee produced a comprehensive set of recommendations for developing educational computing policy and the Poly was to be the centre of these developments. At one point the government intended that every New Zealand secondary school would have a suite of Poly computers. The Poly computer did not reach these ambitious heights. In a context where rival educational computing companies actively, and even illegally, worked against the Poly, the Poly, did not win the financial and political support it needed and subsequently failed to make a significant impact on the New Zealand educational computing market.

In July 1984 the National government lost a general election to the Labour party. By this stage National had managed to introduce only a limited number of the recommendations from the Consultative Committee. The Labour party supported these initiatives, including the newly developed Computer Courseware Development Unit (CCDU). The CCDU is the main focus of chapter six: *The CCDU and the fourth Labour Government (1984-1990).* Under Labour, this small unit of two full-time educators continued as an operational hub for extolling and coordinating predominantly secondary school educational computing. The majority of the CCDU's early work was focussed on computer programming. Its function, secondary-focus and name changed over time, and by 1987 it became known as the Computer Education Development Unit (CEDU). The CEDU contributed to primary and secondary school-based computing activities. Its computer programming beginnings altered to provide a greater emphasis on the use of computers as 'tools' as opposed to programming or computers as tutors and tutees.[22] Connected to the tools approach was also a sense of the great potential offered by computers in education, and the tendency

[21] The name 'Poly' is derived from the word 'Poly-technic'. The Poly was first designed and constructed at Wellington polytechnic.

[22] R. Taylor (1980). Introduction. In R.P. Taylor (Ed). *The computer in the school: Tutor, tool, tutee*. New York: Teachers College Press.

for the CEDU, at least in its newsletters, was to be enthusiastic and optimistic about computers.

The optimism of the CEDU was also observed in the main educational computing policy project of this time: the Exploratory Studies. The Exploratory Studies started in 1987. They were designed to investigate the effect computers on classroom learning. From a sceptic's point of view, the greatest success of these studies was to keep school requests for computer funding on hold. The studies took over three years to complete and most were not publicly released. Overall, the studies did not lead to any significant educational improvements. In many instances there was little or no educational benefits attached to these projects and, from what was eventually reported, should arguably have been used to question the policy context's technocentric confidence about computers and schools.

Outside of the Exploratory Studies, the years from 1987 to 1990 were important times for all education policy. Labour government made an ideological shift in education, at this time, and oversaw many significant changes in the education system. Up until 1987, liberal-progressive approaches had been the dominant government approach to education policy. With the publication of the Treasury's *Government Management Volume II: Education issues* the fourth Labour government became involved with a Treasury-led, 'new right' or 'neo-liberal' push for education policy to better align with economic policy. This movement did not initially have much impact upon the CEDU, but it was a turning point for subsequent educational policy as the Treasury influenced *Tomorrow's Schools*[23] process disestablished the Department of Education, including the CEDU, in favour of a new Ministry of Education.

Under *Tomorrow's Schools* the Ministry of Education was to be a policy ministry with schools as the basic unit of educational administration. Operational areas such as the CEDU were considered superfluous under this arrangement, as indeed was a centrally coordinated approach to educational

[23] Department of Education (1989). *Tomorrow's schools: the reform of education administration in New Zealand.* Wellington: Department of Education.

computing policy. Despite the recommendations of the 1990 Sallis report,[24] the government's approach to educational technology was based around allowing schools to make their own decisions about the role of computers in the classroom. A few months after the Sallis report the Labour government lost the 1990 election to National and it is at this point that chapter six is concluded.

Chapter Seven - Tomorrow's Schools, ITAG and the development of the first ICT strategy (1990-1998) is the longest chapter of this thesis. This chapter is divided into two parts with part one discussing the important contextual developments in the educational computing and part two discussing the developments of the first ICT strategy: *Interactive Education.* The events discussed in part one include the professional development contracts established by the government, the development of school IT resources and the many innovative business-based initiatives for educational computing. The second part of this chapter draws upon the contents of part one to examines the specific policy development processes leading to the 1998 ICT strategy. In particular part two examines how the government's thinking with the work of the Information Technology Advisory Group (ITAG).

ITAG was initially set up to advise the Minister for Information Technology, Maurice Williamson. It was based around several big business leaders and had an essentially economic vision for computers in schools. The core policy problems for ITAG was in finding an affordable solution to improving the numbers and use of computers in schools, while also allowing for the school developed through *Tomorrow's Schools*. By 1998 ITAG developed a cost-effective mechanism for improving educational computing (one that did not require the government to purchase hardware). This solution became the basis for *Interactive Education* - Ministry of Education's first ICT strategy.

The implementation of this first strategy, and the development and implementation of the second ICT strategy, are discussed in *Chapter Eight - The*

[24] New Zealand Consultative Committee on Information Technology in the School Curriculum (1990). *Report of the Consultative Committee on Information Technology in the School Curriculum* (The Sallis report). Wellington: Ministry of Education.

ICT strategies (1999-2004). By the time of the second ICT strategy in 2002-2004, the Ministry of Education and the government were more deeply, financially committed to computers in schools. The education policy Ministry of 1990 had become 2004's chief driver of educational computing, with considerable operational processes and links underway. Economic rationales around the educational computing policy context had enshrined the importance of ICT for schools and for the development of the knowledge economy.

After two decades of neo-liberal influence in education, these processes also tended to be endorsed by much of the mainstream pedagogical discussion and activity around computers. The events in and around the second ICT strategy show a degree of consensus between the educational and the economic rationales for computers in schools. Much of this consensus is based around a broad psychological notion of 'teaching and learning'. In its clearest description this emphasis on teaching and learning links back to how schooling might be carried out rather than what might constitute education. This approach reveals a technical emphasis on how schooling could take place within an ethical framework that is primarily economic. By 2004 educational computing policy has developed to primarily deliver marketable skills to meet the needs of the knowledge economy.

The final chapter of this thesis reflects on the trajectory of New Zealand's educational computing policy. This final chapter functions as a conclusion, while also asking if the trajectory of educational computing has an adequate moral and political basis for education. Drawing on the politicisation of the future that has characterised educational computing policy this chapter asks which future is it we should be considering? One dominated by an economic rationale or some other, more enlightened approach? Building on the themes identified in this research, this chapter discusses the nature and potential of an alternative approach to educational computing policy. It considers alternative ideas for research and an alternative framework for educational computing policy. It does not provide definitive answers to these problems but it does provide a basis for further discussion of what should or could be an even better Next Big Thing.

Chapter Two

Themes in the history of New Zealand's educational computing policy

The previous chapter summarised some of the important changes that have occurred in New Zealand's education between 1960 and 2004. These changes included, the adoption of *Tomorrow's Schools*,[1] the recommendations of the Currie Commission, and, in recent times, the development of the Ministry of Education. The previous chapter also introduced a number of significant events in New Zealand's educational computing policy. These events have included the development of the Poly computer, the CCDU, the Sallis report and the extensive range of initiatives coalesced around the ICT strategies.

Given both the political, administrative and technological developments that have occurred between 1960 and 2004, it might be expected that the educational computing policy context would be too complex to yield any significant themes or patterns. This is not the case however, and a number of important ideas or policy-making patterns have been identified for this thesis. These themes or key ideas provide a way to describe the broad shape of educational computing policy and a way of understanding the overall context of decision-making. These themes are:

- the connections between economics, finance and educational computing;
- the politicisation of the future around new technology and education;
- the optimistic estimations of what new technology can contribute to education;
- the movement away from explicit philosophical, ethical or sociological approaches to education, and education with computers, and a move a psychological approach to 'teaching and learning'; and
- the paucity of critical pedagogical ideas and approaches in educational computing policy.

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[1] Department of Education (1989). *Tomorrow's schools: the reform of education administration in New Zealand.* Wellington: Department of Education.

These themes provide a framework for the discussion in this thesis. They provide a sense of the consistently important ideas while also providing a fluid analytical structure to draw in other important concepts as they arise. Different ideas line up against these themes and these themes compete, interact and overlap with one another in varying ways in the chapters of this thesis. There have, for instance, been different sorts of economic considerations that have impacted on educational computing. There have also been various forms of policy optimism surrounding computers and the relationship between educational computing and the future is as complex as it is political.

Each of these themes is discussed below. These themes have their own section in this chapter but in many ways they are linked together. The points of view presented in these themes overlap and complement each other. This is the nature of these themes and the critical ideas opened up by one of these themes becomes a broader way of understanding the history of educational computing and the key forces and approaches underpinning that history.

Economics and educational computing policy

Computers cost a reasonable amount of money. Compared to a rugby ball, an abacus or a small tape recorder, new computers, are a significant commitment in most school budgets. From the New Zealand government's point of view, a $2000 computer for every school will cost approximately $5.4 million. This is not to mention the costs of software, teacher training and any infra-structural changes that may be required in schools. Understandably such an expensive educational item has therefore, consistently involved some sense of caution regarding the government's expenditure and made cost a constant policy consideration. The New Zealand economy has not always performed well between 1960 and 2004, particularly during the 1980s and 1990s, with the New Zealand government's budget often dominated by deficits and debt.

The cost of computers has contributed to New Zealand policy-makers and educators recognising computers as an investment in education. As computers have moved from the luxurious add-ons, such as Christs College's PDP 8e, to

the (virtually) compulsory use 'across the curriculum' in the late 1990s, the expense of computers has created an expectation of a return. As is presented in this thesis, this sense of return has increasingly been understood in terms of the economic utility and job-skills to be gained from placing computers in schools. Notably this form of economic return is a contrast to concepts of public good such as the production of a more democratic or tolerant community. Such a point of view is exemplified by the 1998 comments of Maurice Williamson, who noted among the advantages of computers in the classroom, is the link they create with the 'knowledge economy':

> New Zealand is rapidly becoming a `knowledge society' with a workforce largely composed of a wide variety of `knowledge workers'. These workers have special skills which require continual updating, so a top quality education system is essential.
>
> Information technology (IT) is a vital feature of the move to a knowledge society.[2]

The first educational computing in New Zealand schools was subject to some form of the economic thinking. In 1969, for instance, Management Consultant Philip Harding was among those who suggested that there was an economic rationale for teaching computing in schools and Universities. Noting that the United States had started to use computers in their primary schools, Harding's concern was directed at the limited amount of computer-based education in New Zealand secondary and primary schools, especially given that computers had started to make in-roads into areas of the economy such as banking.[3]

In the early 1980s, the New Zealand government's work on the Poly computer was linked to both the increasing use of computers in the work force and the worsening of New Zealand's economic position. At this time, there were a number of teachers who suggested that the government provide support to the computer-based learning underway in secondary schools. Although it is difficult to identify the extent to which educators themselves drew upon economic rationales, the economic rationales of policy-makers were seemingly shared by

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[2] Information Technology Advisory Group (ITAG), New Zealand Future's Trust and Information technology Association of New Zealand (ITANZ) (1996). *Impact 2001 how ICT will change New Zealand*. Wellington.

[3] P. Harding (1969). Computer in the classroom. *Education equipment review* May 1969 pp2-3.

some educators. As this 1981 excerpt from the Post-Primary Teacher's Association implies:

> It is being argued that the new technology offers New Zealand the opportunity to escape from its economic difficulties and that the resources of a well educated population with a relatively low professional salary structure could exploit the international market for computer software with considerable advantage to New Zealand's balance of payments.
>
> Investment in secondary education to equip young people to handle the new technology is therefore an investment in the country's resources. The long-term advantages will justify the additional expenditure on education. [4]

From 1987 onwards, economic points of view about educational computing intensified, and the New Zealand educational context became subject to technocratic, new right or neo-liberal, views of education.[5] These views were shaped by the market logic of economists and sought to establish education as a commodity or private good, rather than an investment in the social goods of the whole community.[6] Through the political success of such documents as Treasury's *Government Management Volume II: Education issues* (1987), a more 'skills-based', or what Michael Peters and James Marshall have called, a 'busnocratic'[7] view of education, developed in New Zealand education policy, which has emphasised the idea that schools, through their role in the development of human capital, are strongly linked to economic policy.[8]

By the 1990s the busnocratic context of New Zealand policy and government intensified its concern with 'economic competitiveness in the global economy'. The government's demand for education's primary goal was based on market skills and this was became the widely accepted view in education policy and practice. The introduction to the government's 1993 outline of the future

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[4] NZPPTA Annual Conference (1981). Microprocessor technology and secondary education. Wellington.

[5] P. Fitzsimmons, M. Peters and P. Roberts (1999). Economics and the educational policy process in New Zealand. In M. Thrupp (Ed) *A decade of reform in New Zealand education: where to now?* Hamilton: School of Education, University of Waikato.

[6] G. Grace (1990). The New Zealand Treasury and the commodification of education. In S. Middleton, J. Codd, A. Jones, (Eds) *New Zealand education policy today.* Wellington: Allen and Unwin pp27-39.

[7] M. Peters and J. Marshall (1996). The politics of curriculum: busnocratic rationality and enterprise culture. *Delta* 48 (1), pp33-46.

[8] See also M. Thrupp (Ed) (1999).

education system, *Education for the 21st century*, even links educational technology to technological change itself, suggesting that changes, such as the advent of the computer, require a more skills-based, economic or market approach to the education system:

> Technological change builds upon itself. It has been accelerating ever since human beings first decided to improve their standard of living. In the second half of the twentieth century we have seen technological change accelerate to the point where the world in which people live and work is very different from the one in which they grew up.[9]

The third paragraph of this text makes the link to the economic nature of education generally:

> We live in a global community and a global marketplace. If we seek to improve our economic standing relative to that of our competitors, our commitment to education and training must be greater than that of other countries. We must adapt more quickly to change than our competitors, and the skills of our workplace must improve faster than the skills of other workforces. We must invest in people our greatest economic resource.[10]

This economic, or busnocratic, view of education and market skills has persisted through to 2004. The expectation of economic return from education, has, for example, been cited as an important factor in the 2004 expansion of the ICT professional development clusters. The Minister of Education, Trevor Mallard, set out the rationale for such a policy in much the same way as was presented by *Education for the 21st century* a few years before:

> Our government is deliberately focussing on information communications technology as one of the keys to growing a more innovative economy. Ensuring our students are equipped with 21st century skills is a top priority for our work in education, as it has become an important and very successful tool for students' learning[11]

The persistence of this busnocratic point of view provides strong evidence for its success as a policy decision-making paradigm. Although this thesis

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[9] Ministry of Education (1993). *Education for the 21st century*. Wellington: Ministry of Education pp3.

[10] Ibid

[11] T. Mallard (2003). *Big push for ICT in schools* Beehive press release 17 October 2003, as sourced 30 January 2006 from http://www.beehive.govt.nz/ViewDocument.aspx?DocumentID=18133.

emphasises the educational arguments against this approach there are economic arguments against a busnocratic approach too. As Alison Wolf has suggested, on the basis of her empirical analysis of OECD[12] countries, there is no necessary connection or pattern between economic growth and a country's educational success, specifically higher and vocational educational success.[13] Moreover, the increasingly strengthened links between economy and education in OECD education systems have resulted in education becoming increasingly narrow, thereby shutting down its wider social functions and becoming an increasingly expensive way of sifting employees for the workforce.

> We are told that in a "knowledge economy," a country needs ever more graduates and formal qualifications to stay competitive. But education simply does not deliver economic growth the way our politicians - and businessmen - believe: more education in does not mean more growth out. Worse, the education policies that follow from current beliefs have serious negative consequences for opportunities for young people and the quality of education itself.[14]

In relation to the development of educational computing, the specific argument therefore follows that an emphasis on computer skills for economic growth potentially crowds out other areas of the curriculum, including those traditionally important social areas of the curriculum. This could, for instance, include various components including art, drama, music, media studies, environmental studies, reading and science. More work is required to understand the extent to which this has occurred.

The work of Wolf can also be extrapolated to question the logic of New Zealand's investments in educational computing on the basis of the expected economic returns. Despite the development of a market skills rationale surrounding computers and education, the government's expenditure on education has meant that schools have received very little government financial support for the development of educational computing. Since 1998, there has been an improved government fiscal situation, and there has been an increase in

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[12] Organisation for Economic Co-operation and Development (OECD). See also OECD.org

[13] A. Wolf (2002). *Does education matter? Myths about education and economic growth.* London: Penguin.

[14] A. Wolf (2004). *The Education Myth.* As sourced 17 October 2004 from http://www.projectsyndicate.org/commentaries/commentary_text.php4?id=1674&lang=1&m=series

government expenditure on educational computing. Ironically, this increased spending on computers in New Zealand schools has followed, rather than preceded, an improvement in the government's fiscal position.

The politicisation of the future

As can be seen in the examples from the previous section, educational and policy discussion concerning the economic and educational utility of computers in the classroom frequently includes some reference to the future. The future offers those seeking political support for a particular policy with an area rich in possibilities – and uncertainties. On the one hand the future provides a focus point for discussing the positive benefits or potential of educational technology and on the other hand there is always the potential for being left behind. Consider the following 1983 example from Paul Vincent, who was subsequently employed as a member of the government's Computers in Education Development Unit (CEDU), note especially the final point:

> [The] wider educational uses [of computers] which have been identified include:
>
> 1. their potential for remedying deficiencies in the three R's;
> 2. the availability through them of large-scale networks;
> 3. the opportunities offered to schools to pool their teaching resources;
> 4. the reduction of the resource disadvantages suffered by smaller schools;
> 5. the facilitation of more individualised teaching;
> 6. the promotion of active, creative behaviour in children;
> 7. the provision of wider learning experiences than ...[is] currently possible in the conventional classroom;
> 8. the strengthening of family bonds by allowing adults to work at home;
> 9. their extensive and intensive use with disabled or handicapped persons;
> 10. the necessity to equip today's children to live in tomorrow's computer dominated society.[15]

The optimism of this potentialised list by Vincent is discussed in more depth in the following section, but at this point it is important to draw attention to the

[15] P. Vincent (1983). Classroom computing – current attitudes. *Interface* October 1983 pp38-39.

double-sided nature any such discussion of the future as implied within point ten. Against the optimistic possibilities for educational computing, is a darker uncertainty about 'your child's future'. This is a persuasive combination for parents and teachers who may be likely to uncritically absorb the possibilities for educational computing as part of a conservative decision-making process about the need for educational computing – just in case.

These future-based ideas have been applied in many situations. During the 1980s and 1990s, for instance, there were several advertising campaigns inviting parents and community members to collect 'proof of purchase' towards new computers for their children's school. See for example, the opening paragraphs of one advertorial:

> Business people behind this year's *Apples for the Students* programme are all agreed: education in computers is a vital part of preparing today's children for the commercial world they will inherit tomorrow.
>
> It is not overstating the case ... to say New Zealand's economic future depends on students' ability to master the complexities of computer technology.
>
> It makes sound commercial sense... for businesses to back teachers and parents in their efforts to secure the best computer equipment for their children.[16]

Policy-makers and business interests have enhanced the persuasiveness of their arguments about the future by combining the best-case scenario with a worst-case scenario. The following paragraphs from a *Sunday Star-Times* article, 'Technology set to change the face of teaching', demonstrates such a manoeuvre:

> At the heart of the new technology philosophy to classroom learning is the acknowledgement that children need new skills to equip them for the radical new demands of the technological future.
>
> ... "If teachers don't understand communications systems and aren't comfortable with new technologies, the kids miss out."
>
> Better organised schools are identifying funding opportunities for computer resources.... but school management and parents must take the initiative, says Mr Treadwell.[17]

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[16] *Living today* (1993). pp11-12.

[17] M. Henderson (1995). Technology set to change the face of teaching. *Sunday Star-times* July 30 1995 ppC11.

A similar application of the future was also used for educational television. In 1967 educator Jack Shallcrass suggested that "television is likely to be one of the most powerful educational forces yet discovered".[18] In some unfortunate ways it can be argued that Shallcrass has been correct.

It could be expected that Shallcrass might have learnt from such statements once educational computing had developed. However in 1985 Shallcrass in the following comment, he quotes John Tiffin in highlighting the futuristic economic rationales of computers alongside their potential educational benefits:

> New Zealand has the position and the opportunity to become the centre of learning and a supermarket for sunrise technologies, says Tiffin. ... One of the most urgent needs is to shift the school curriculum more vigorously from the old skills to the needs of new technologies.... The new world will have very little need for unskilled people.[19]

The logic of such a position is unmistakeable: adopt technological skills, over traditional skills, or risk your future. The power of the economic justification for future computer skills resides in the public and political fear provoked by economic insecurity. It is a logic that is effective on many parents, business people, politicians and some respected liberal educators. It is a point of view that is therefore shared across the community. Note below how Shallcrass's point of view is somewhat mirrored in a 1991 speech to teachers by the president of the Wellington Chamber of Commerce:

> You know what is required to develop and mould your students to suit the 'customers' (future employers). ... We must indeed have computers in classrooms today so we'll have the skills we will need tomorrow.[20]

While economic factors have been connected to many futuristic rationales for computers, there have been other approaches and rationales in the socio-political context arguing for and against the technological future. In the 1970s and the early 1980s for instance, societal concerns about privacy, in light of the

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[18] J. Shallcrass (1967). *Educating New Zealanders: Essays in education.* Wellington: Reed, pp73.
[19] J. Shallcrass (1985). Micro ways. *NZ Listener* 24 August 1985, pp85.
[20] Address by Sharryn V Waters (President of the Wellington Chamber of Commerce). to the 1991 Telecom Kids, classrooms and computers conference.

electronic storage of personal information, led to public concern about the development of computers. The development of the Wanganui computer system provoked a 1974 Listener article by Auckland university law lecturer, Francis Auburn about the 'threat to the future' posed by computers.

> [The Wanganui computer] is presumably modelled on United States systems, which is one good reason for fearing abuses.[21]

As an educational example, constructivist rationales have usually, strongly argued in favour of the introduction of computers to the classroom. Drawing on their ideas about learning theory and cognitive psychology, constructivists have suggested that there are large, future-linked benefits in student motivation, decision making, cooperation and thinking through computers and constructivist teaching.

> Given the opportunity to construct meaning in their own minds through active and interactive learning technologies, students can become stronger thinkers. The use of learning technologies have therefore been found to have a significant positive effect on student achievement, self-esteem and attitudes towards learning. "Students felt more successful in school, were more motivated to learn and had increased self-confidence and self-esteem when using computer-based instruction. This was particularly true when the technology allowed learners to control their own learning." [22]

And...

> The technology offers a very accessible means for collaborative learning and working together to solve problems and create ideas. It facilitates connected learning, enabling far distant people to communicate with ease, speed and real time, and placing students in what can be termed a 'global classroom'. Learning with ICT also brings about constructive learning. It enables students to develop their own questions, and affords them a greater range of opportunities to find answers to those questions and so build on their understandings of their world.[23]

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[21] F. Auburn (1974). The computer threat. *NZ Listener* August 10 1974, pp12.

[22] Extract from Switching on learners in the middle years – a pedagogy of engagement through learning technologies with a quote from Interactive Educational Systems Design (1995). Report on the Effectiveness of Technology in Schools. Software Publishers Association: Washington, DC. Cited in Learning Enhancement Associates summary of research findings on the impact of ICT on education as sourced 5 May 2004 from www.lea.co.nz/ict/eResources/ICTimpact.doc.

[23] G. Ramsay (2000). *Teaching and Learning With Information and Communication Technology: Success Through a Whole School Approach*. Available from http://www.ictev.vic.edu.au/acec2000/paper_ref/g-ramsay/paper22/paper22.PDF as cited in Learning Enhancement Associates summary of research findings as sourced 5 May 2004 from www.lea.co.nz/ict/eResources/ICTimpact.doc

The following two sections further explore constructivist points of view within a discussion of the optimistic claims put forward about technology and learning. It should also be noted here however, that the research which provides these quotes, and which has helped inform New Zealand educational policy, was provided by a software company. The apparent conflict of interest has gone unnoticed by educators and policy-makers alike as such research has constituted policy literature reviews as forms of policy evidence.[24] Given the level of investment provided by such companies, and the shear weight of research contributions they provide, it is perhaps not surprising that educators, policy-makers and even academics are unclear about robust sources of educational research and why they can so easily find research supporting extremely positive views of technology in the classroom.

Optimistic estimations of technology in education

The optimism of many of the educational and economic rationales for educational computing are based upon a 'technocentric' belief that computers can act as a catalyst, facilitator or direct cause of educational improvement.[25] In some respects this optimism can be seen to have increased over time, as computer technology has improved and as computers have more readily purchased by schools. Observe, for instance, in 1982, when the Consultative Committee on Computers in Schools, set out its optimism in terms that emphasised the assistance that computers offered in the classroom. Computers were to be an aid to support and encourage the existing learning in the classroom:

> The computer also has the potential to improve the quality of education in schools by assisting the processes of learning and teaching. ... In this way the computer can become another aid to the teacher, performing certain tasks more effectively than could be done otherwise....
>
> The computer is also a powerful tool by which students and teachers may be encouraged to enquire, to respond creatively and inventively and a means by which they may gain personal satisfaction through learning and accomplishment. The machine appears to have almost unlimited

[24] This document informed a Ministry of Education literature review on computer-aided learning see http://www.minedu.govt.nz/index.cfm?layout=document&documentid=5499&data=l as sourced 17 October 2004.

[25] R. Stratford and M.E. Brown (2002). Towards a political understanding of New Zealand's ICT strategies. *Computers in New Zealand Schools* 14 (2) 2002 pp3-9.

> potential to stimulate the imagination and to act as a device to foster enquiry, investigation, exploration, discovery and research.[26]

The last sentence fails to contain the excitement the committee felt about the potential of computers in education. This optimistic discussion of what computers 'may' achieve in the classroom can be compared with the ICT strategies of the late 1990s to 2004. Instead of using words such as 'may' and 'assist', these strategies, linked to new approached to learning, use more direct terminology, such as 'can', 'transform', 'enable', alongside terms such as 'provide' and 'allow', and place technology more directly in the centre of educational change. In the first ICT strategy *Interactive Education* (1998),[27] for instance, the idea that ICT can improve the quality and effectiveness of learning is central to this policy's point of view:

> The objectives around the national strategy for ICT in schools are to:
>
> - improve student learning outcomes through the use of ICT in teaching and learning[28]

Moreover ICT is placed at the centre of a range of educational solutions:

> ICT can:
>
> - enable teachers to become learners as they learn to use and teach with the technologies
> - provide a platform for cross-curricula and integrated approaches to learning
> - allow access to up-to-date and appropriate resources
> - enable interaction with peers in local, national and international networks...
>
> In addition it can:
>
> - provide opportunities for authentic, independent and collaborative learning...
> - provide access to a wide range of changing and developing information sources
> - enable active participation and the application of knowledge in authentic contexts

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[26] Department of Education (1982). *Computers in schools*. Report of the consultative committee on computers in schools. Wellington pp11-12.
[27] Ministry of Education (1998). *Interactive Education – An information and communication technologies strategy for schools*. Wellington: Ministry of Education.
[28] Ibid pp10

- enable learners to be more focussed on inquiry, problem solving, synthesis and other higher order thinking skills
- provide opportunities to focus on the acquisition of information skills.[29]

As the earlier Shallcrass example demonstrates, educational television has been failing to achieve such educational benefits for decades, although no mention is made of this within the strategy. There is also no reference in the first ICT strategy to any literature that might support the silver bullet teaching and learning qualities of ICT, or the role to be played by the (more) important social and pedagogical conditions that would allow an educational setting to even approach the claims made here. The second ICT strategy, *Digital Horizons*, was introduced with more of a 'teaching and learning' focus, perhaps as a partial response to these deficiencies in the first strategy. A more detailed analysis of this shift is undertaken in *Chapter Eight - The ICT Strategies*, and at this point it is worthwhile noting that this document at least continues the optimistic tone of the first strategy, albeit in moving from the language of direct cause of educational improvement to a more hedged position involving technology as an important cause – or facilitator of educational change:

> ICT is arguably one of the most powerful of all educational tools. It creates many options and opportunities for learners, It facilitates:
>
> - diverse, motivating approaches to learning
> - access to an ever increasing range of digital resources and online learning programmes
> - interaction with the wider community.[30]

While there is contemporary and historical research purporting to verify the success of particular educational computing initiatives,[31] it is useful to place the transformational claims of the ICT strategies against those research findings which suggest that the rewards of educational computing, in New Zealand and overseas, have failed to materialise. For instance, in 2000 research led by Philip Capper suggested that New Zealand's educational computing was far from

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[29] Ibid pp8

[30] Ministry of Education (1998). *Digital Horizons.* Wellington: Ministry of Education pp8.

[31] See for instance http://www.lea.co.nz/

innovative in practice with most educators taking a skills-based, rather than informed pedagogical approach, to computers in the classroom.[32]

Also in 2000, the Education Review Office (ERO) found that New Zealand schools generally reported that the introduction of computers to the classroom appeared to support only those learning outcomes associated directly with computer skills.

> Many schools are unable to point to specific improvements in teaching and learning that have been brought about through the use of ICT. The improvements mentioned most are those directly related to the use of technology (such as improved standards of writing, presentation and graphics) rather than improvements in areas such as problem solving.[33]

ERO also found that schools were not using computers as part of any improved learning approaches, but rather were following a pattern of buying equipment, training teachers and then not particularly using the technology to improve learning.

> While most schools now possess ICT equipment, there are infra-structural issues that have yet to be fully addressed. While considerable effort has been devoted to professional development, levels of teacher skills and confidence remain a concern for a large number of schools. The most difficult part of the ICT Strategy – integrating ICT into the curriculum and using it to improve teaching and learning – has yet to be tackled in many schools.

Internationally, the work of Larry Cuban provided a compelling critique of the rhetoric and reality of educational technology. As Cuban has suggested, educational technology, of which computers represent a significant subset, have 'over-promised and under-delivered' for formal education. Drawing from an historical perspective on educational change, Cuban notes the repeated failure of educational computing to reform schooling in the dramatically positive ways envisioned by reformers, and instead points out that "when teachers adopt technological innovations these changes typically maintain rather than alter

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[32] P. Capper. L. Bowen-Clewley, and B. Harris (2000). *Managing information and communications technology in schools*. Wellington: Centre for Research on Work, Education and Business Ltd.

[33] Education Review Office (2000). *The implementation of Information and Communications technology (ICT) in New Zealand schools*. As sourced 5 May 2004 from http://www.ero.govt.nz/Publications/pubs2000/implementationICT.htm

existing practices".[34] From another perspective Cuban's research helps demonstrate that those cases where educational technology may connected to successful educational innovation draw upon much more than the qualities inherent in the technology.

For those who argue that computers can act as a catalyst for educational change Richard Venezky, summarising 94 OECD case studies in 1999-2000, suggests that:

> ICT rarely acts as a catalyst by itself for schooling change yet can be a powerful lever for realising planned educational innovations.[35]

In this case the concept of a lever refers to ICT's ability to support well-founded pedagogical practice already within the social context. That is to say that the social context was the dominant variable in whether ICT could be used to any expressed potential. Computers do not therefore catalyse a social context that lacks the pedagogical and infra-structural elements to deliver effective education.

The lack of credible evidence regarding the success of educational computing has meant that in the United States, although not yet in New Zealand, there has been a backlash to the use of computers in schools. Critics of technology have come from all parts of the political spectrum. Jane Healy has criticised the drive towards using computers with young children and has questioned the developmental appropriateness of computers in junior primary classrooms.

> Older students can better use these machines as "ramps to the abstract," in David Perkins' words, at a time when they are more developmentally appropriate.
>
> But won't the little ones fall behind? Nonsense! Not only will the technology be constantly changing, but it has been repeatedly shown that

[34] L. Cuban (2001). *Oversold and underused: computers in the classroom.* Cambridge, Mass: Harvard University Press.
[35] R. Venezky (2004). Technology in the classroom: steps toward a new vision. *Education, Communication & Information* 4 (1) March 2004.

> 10-year-olds--or even adults--can master complex computer skills even without previous experience.[36]

Todd Oppenheimer is more straightforward in his criticism.

> There is no good evidence that most uses of computers significantly improve teaching and learning, yet school districts are cutting programs -- music, art, physical education -- that enrich children's lives to make room for this dubious nostrum[37]

Considering the debate within the United States about computers in schools, one can speculate when more vocal techno-sceptics will develop in New Zealand. Oppenheimer's criticism implies that the level of attention paid to developing technological skills may have a negative impact on other aspects of the curriculum. Given the busnocratic context in which schools operate it may be that, in contrast to Cuban's points, while educational technology is not fulfilling the educational potential alleged by reformers, it does seem to be ensuring that computer skills are being develop in students before they enter the workforce. That is to say the teaching and learning approaches to educational computing in New Zealand may have been somewhat unsuccessful at becoming widely integrated, but they have met the needs of at least one agenda – those connected to certain forms of enterprise.

From an ethical and philosophical approach to education to a psychological focus on improving teaching and learning

In 1962 the Currie Commission made explicit its links to Peter Fraser's 1949 vision of education.[38] This oft-quoted vision sets out the basis for what was to become a liberal-progressive approach to education in New Zealand with links to equality of opportunity, fairness, and an emphasis on the development of well-rounded citizens:

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[36] See the links to Jane Healy's work at the edtechnot website as sourced January 31 2006 from http://www.edtechnot.com/nothealy.html
See also the alliance for childhood and their report on computers in education as sourced January 31 2006 from
http://www.allianceforchildhood.net/projects/computers/computers_reports_fools_gold_contents.htm

[37] T. Oppenheimer (1997). *The computer delusion.* As sourced 5 May 2004 from http://www.theatlantic.com/issues/97jul/computer.htm

[38] See Chapter Four of this volume

> The government's objective, broadly expressed, is that every person, whatever his level of academic ability, whether he be rich or poor, whether he live in town or country, has a right, as a citizen, to a free education of the kind to which he is best fitted, and to the fullest extent of his powers.

The extent to which this philosophical vision for New Zealand education was ever realised however, is a moot point. Indeed the inability of New Zealand's education system to provide for equality of opportunity was argued in Treasury's *Government Management*.[39] What can be seen as this thesis unfolds, is the degree to which support for Fraser's vision has diminished from 1960 to 2004. Over time, Fraser's philosophical framework for education has been replaced with an economic or busnocratic approach to education policy. Although instrumental approaches to education were present in the educational policy context throughout this period, the turning point was in 1987 when education policy became an element of economic policy and the explicit links to citizenship, fairness and individual development are extensively mitigated.

Chapter Four this thesis discusses how the political seeds of this process were present at the Currie Commission. As John Codd suggested, a technocratic approach to schooling surrounded the Commission.[40] Roger Openshaw has made a similar point with his broader discussion about the origins of the neo-liberal economic points of view that became dominant in the 1980s.[41] Openshaw notes that the ideas on which neo-liberal politics are based, are present in various forms long before Treasury published *Government Management*. In a sense they were engaged in a discursive contest with liberal-progressive point of view (among others) – a contest that is dominated by busnocratic ideology from 1987 onwards.

Post-1987 the dominance of busnocratic ideas has been supported by the increasing importance placed upon psychological approaches to teaching and

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[39] Treasury (1987). Government management brief to the incoming Government 1987. Volume II: Education issues. Wellington. Note the cheeky quote of Ivan Illich pp38.

[40] J. Codd, R. Harker and R. Nash (1985). *Political issues in New Zealand education*. Palmerston North: Dunmore press pp26.

[41] R. Openshaw (2003). Preparing for Picot: Revisiting the "Neoliberal" Educational Reforms. *New Zealand Journal of Educational Studies* 2003 2.

learning. While economics has fulfilled the primary rationales for why education policy is important, psychological approaches have provided much of the technical information regarding how schooling should be undertaken. Psychological perspectives have the advantage of drawing upon empirical forms of evidence in a way that is reflected in the methodologies of economics and finance. Indeed busnocratic points of view, which have been based on positivist or mechanical notions of the world, have found something of an accord with the quantifiable and behavioural tendencies psychology.[42]

Psychological theories have also been closely linked to educational computing. Constructivist approaches for instance have become 'common sense' and the norm for rallying teaching and learning with computers.

> The design and construction of effective, technology-rich learning environments requires a sound pedagogical framework that is constructivist and is mediated by a teacher who is equipped with clearly defined learning outcomes.[43]

While constructivist approaches have much to offer education, it is important that this term is put into perspective. Constructivism, in its generalised form suggests that learning is best when learners are actively involved in the development of knowledge. While this point of view can be defended from the literature on learning theory, there is much more about constructivism, and learning theory generally, that should explained. Brown has discussed the tensions in this field as they relate to educational computing in New Zealand. Brown notes that, like the introduction of information technology, constructivism is often discussed and utilised in simplistic and generalised ways.[44] Indeed quite different perspectives can both be presented under the guise of constructivist learning theory. Moreover, quite limited educational ideas can also be introduced with limited critique because they have been labelled constructivist. Learning styles is one such approach, but some of the techniques that may be introduced under the range of perspectives within the

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[42] See the following chapter for a broader discussion of these notions.

[43] M.E. Brown (2003). Beyond the digital horizon. *Computers in New Zealand schools* 15 (1) pp38

[44] M.E. Brown (2000). Learning in the 21st century: Being critical, going deeper and thinking smarter. *Computers in New Zealand Schools* November 2000 pp3-7.

constructivist family of learning theory, also qualify. These tensions can be seen in the discussions that emerge regarding the role of the teacher in a constructivist classroom. Is the teacher a facilitator, as is so often claimed? To what extent should this be the case and what is the teacher's role when it comes to the ethical development of students and areas that may be best served by direct teaching? What is the role of knowledge within such an approach? Is it to only have relevance to classroom activity? What is the role of the government provided curriculum and what is the role of ideas that the student, might otherwise, have taken a lifetime to discover?

These questions are not answered here, but they are provided to sketch some of the potential complexities of constructivism. It is worth reiterating Brown's point here that, like information technology, learning theory is only as sophisticated as they social context it which it is operating. hence the concern from this thesis is the operation of psychological perspectives in an environment where the ethical and sociological perspectives have shifted from Dewey's original ideas about education and towards a sociology that is chiefly busnocratic. Indeed busnocratic approaches have provided the base assumptions for schooling and psychology had provided the basis for how teaching and learning should take place. The sociology and philosophies of learning set up under Fraser have become somewhat redundant, squeezed out of the discursive contest around educational policy.

The paucity of critical pedagogical ideas and approaches in educational computing policy

As the discussion above notes, New Zealand's educational computing policy context has tended towards economic, optimistic and futuristic notions of education with computers. While the previous themes have provided an insight into what has occurred in educational computing from 1960 to 2004, this theme provides an additional perspective, and characterises the tendency towards economically linked, optimistic and futuristic educational computing policy rationales in terms of a potentially important intellectual omission. This

omission is based on those ideas and approaches that posit education as a humanistic, self-actualising and democratic process. [45]

Focussing on the omission of critical pedagogical ideas is important[46] because they stand in opposition to the processes that have dominated educational computing policy in New Zealand. While economic and future-based pedagogy has often been concerned with developing economic and vocational skills, critical pedagogical ideas emphasise the broad basis of education and provide a basis for questioning the trajectory of a technological world for work and economic growth. Earlier discussions in this thesis located the critical pedagogical ideas in the work of such writers as Freire and Giroux. The social transformationist perspective of these writers has been notably absent from both the policy and practice contexts of educational computing. Any comments in the policy context about computers and the development of a 'critical citizenry' have been restricted to a few comments during the earliest introductions of computers into the classroom.[47] There has, at various times, been some effort from policy-makers to support ways in which computer technology might be managed or considered by teachers, most notably for improved student safety or awareness, but there has been very little consideration of those critical pedagogical positions, which consider educational computing in relation to the broader social, environmental and democratic possibilities for education.[48]

A critical consideration of technology can also help explain the absence of critical pedagogical ideas from the policy context and the emphasis placed optimistic, futuristic and busnocratic rationales for computers in schools. McDermott has, for instance, suggested, that new technology often brings with it simplistic thinking about solving social and political problems because of the

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[45] For example P. Freire (1972). *Pedagogy of the oppressed.* Middlesex, New York: Penguin; H. Giroux (1995). Foreword In M. Peters (Ed)., *Education and the postmodern condition.* Westport CT: Bergin & Garvey.

[46] New Zealand's educational computing policy has never included a strong link to purple people eaters either

[47] See chapter four of this volume

[48] See also T. Gale and K. Densmore. (2003). *Engaging teachers: Towards a radical democratic agenda for schooling.* Philadelphia, Pa: Open University Press. C.A. Bowers (2000). *Let them eat data: how computers affect education, cultural diversity, and the prospects of ecological sustainability.* Athens: University of Georgia Press.

common confusion that occurs in the linking of technological progress with social progress.[49] Hence the development of particular scientific and technological improvements in terms of health-care, communications and transport are seen as being specific evidence of unquestionably positive social development. Questions about the 'spill-overs', 'externalities' or, depending on your point of view, the direct negative consequences of technological developments, are not therefore not sufficiently considered or problematised. For example, the pollution developed from the manufacture of many electronics, the creation of super-bugs as a result of anti-biotic use (and misuse) and the potential for loss of language and cultural practices are not considered as indicators of something other than 'minor' issues within the general social progress. Indeed such effects may be characterised by techno-advocates as a separate technical problem to be solved at some later date, rather than as an inherent negative connected with the technological process and the technology itself. An extreme example easily demonstrates the problem with such logic, for instance the construction of nuclear, chemical and biological weapons, whilst arguably impressive technological feats, provide the basis for a less convincing argument about their contribution to social progress and their ability to create, only soluble, technical problems in the future.

While computers are not weapons of mass destruction, they do nevertheless bring changes to the social structure, thereby demanding critical consideration if they are to be used in schools. In contrast to the way New Zealand policy-makers have consistently approached educational computing policy, it is important to point out that computers are not neutral technological tools.[50] For instance, educational software, such as that used to help with reading and mathematics, is far from neutral in its design, usually favouring the explanations and assumptions of dominant ideas and cultures.[51] 'Tool' software such as the

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[49] J. McDermott (1990). Technology: The opiate of the intellectuals. In *Technology and the future* A. H.Teich, (Ed) New York: St. Martin's Press; R.W. McChesney, E.M. Wood and J.B. Foster (1998). *Capitalism and the information age: the political economy of the global communication revolution* New York: Monthly Review Press.

[50] H. Bromley (1998). Introduction: Data Driven Democracy? Social Assessment of Educational Computing. In H. Bromley and M. W. Apple *Education/Technology/Power: Educational Computing as a Social Practice.* New York: SUNY Press.

[51] A. Agalianos and P. Cope (1994). Information technology and knowledge: the non-neutrality of content specific educational software. *Journal of Educational Policy* 9 (1), pp34-45; K.

internet, CD-Roms and word-processors, help to confuse knowledge and information;[52] while databases can create a false sense of mechanised objectivity and authority in the electronically tidy and atomised ways they present information.[53] Simulations reinforce a mechanised model of the world and can suggest false ideas, especially about the physical, political and environmental elements they leave out. Alongside their positive qualities word-processors can also limit human expression by celebrating form over meaning, technique over content, formatting over truth, human scrawl and ambiguity over clinical type fonts.[54]

Among their many non-neutral qualities, computers also bring with them notions of the market. Computers are, by their nature, produced for reasons of commercial profit. In connection with their expense computers can help create additional demand for measurable results, and thereby a more prescriptive system of education. In this sense computers change power relationships and create new zones of social activity, they bring about mechanised approaches to knowing and presenting at the expense of traditional forms of expression. Whaikorero, drama, dance, music and visual art are threatened in a cultural setting which over-values technology. [55]

Against these ideas about the modernist notions of progress it is ironic that it is the earlier periods of New Zealand's educational computing policy history that arguably show a greater awareness of the possible pitfalls brought by new technology. Critical international comment on computers dates back to 1969 with the publication of Oettinger's *Run Computer Run*. As *Chapter Four* and *Five* of this thesis suggest public concern in the 1970s and 1980s about privacy, unemployment and computer/human error probably contributed to the idea that

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Bishop and J. Bishop (2000). Gender and racial bias in juvenile computer books. *Knowledge Quest* 28 (3), pp18-24.

[52] M. Peters (1998). Education and the shift from knowledge to information: Virtual classrooms or automated diploma mills? *Access* 17 (1), pp65-78.

[53] D. Chandler (1993). The purpose of the computer in the classroom. In J. Benyon and H. Mackay (Eds) *Computers into classrooms more questions than answers*. London: Falmer Press.

[54] Ibid

[55] See also J. M. Healy (1998). Failure to connect: how computers affect our children's minds - for better and worse. New York: Simon and Schuster. C. A. Bowers (1988). The cultural dimensions of educational computing. NewYork: Teachers College press.

junior secondary students required a computer awareness course. Besides offering students an initial hands-on experience with computers this course was to include material on the computer's "capabilities, limitations and the major applications in which it is found and its effects on society".[56] Admittedly the computer awareness course was less than the critical awareness process that might be developed by a critical (social transformationist) educator, but, along with other initiatives, helps to reveal that at this time there was a degree of policy consideration about the pros and cons of new technology.

Moreover even this limited computer awareness position has not been sustained in New Zealand's educational computing policy. From 1987 for instance, along with the greater acceptance by policy-makers of the 'economics of education', there has been very little consideration of the potential disadvantages of technology. Somewhat outside the policy context, the internet safety group has provided one source of questioning about the use of technology.[57] Within policy context, the nadir of thinking about potential disadvantages of technology point is the Ministry of Education's 2002 narrow and economic construction of 'digital literacy' and its complete avoidance of the idea that technology and the social context can lead to negative social impacts:

> Digital literacy is the ability to appreciate the potential of ICT to support innovation in industrial, business and creative processes. Learners need to gain the confidence, skills and discrimination to adopt ICT in appropriate ways. Digital literacy is seen as a 'life skill' in the same way as literacy and numeracy.[58]

As the example of 'digital literacy' also demonstrates, at least in relation to educational computing policy post-1987, the differences between many of the pedagogical rationales and the economic rationales about educational computing have been blurred in New Zealand. The economic potential and benefits of computers is preferred to questions about the failure of new technologies; and the effects on poorer and/or traditional cultures? Strikingly

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[56] New Zealand Consultative Committee on Information Technology in the School Curriculum (1990). *Report of the Consultative Committee on Information Technology in the School Curriculum* (The Sallis report). Wellington: Ministry of Education pp17.
[57] http://www.netsafe.org.nz
[58] Ministry of Education (1998). *Digital Horizons.* Wellington: Ministry of Education.

absent are any critical educational questions for teachers about the role of education for its own sake; education for citizenship; education for democracy; education for human development; and education for cultural awareness? These ideas now appear secondary to the slightly fearful ICT-based drive towards 21st century skills.

These ideas are considered again in the final chapter of this thesis. Central to this chapter is the ideas that there may be contestable versions of the technological future alongside the hegemonic busnocratic version. This chapter sets out some broad areas for what one particular alternative approach might involve. In the following chapter the critical discussions set out here provide a basis for the methodological approach underpinning the contextual analysis used to structure the ideas detailed in the subsequent chapters of this thesis.

Chapter Three

Getting under the surface

The previous chapter discussed a set of themes underpinning this research. These themes provide a framework for discussing the findings of this thesis. They emphasise a that number of ideas that have dominated New Zealand's educational computing context over time, including various economic and techno-optimistic points of view. These themes also culminate in the idea that New Zealand's educational computing policy has lacked any real links to critical pedagogical ideas, such as those related to the potential role of education in a humanising, democratic and environmentally sustainable culture.

This chapter begins with a brief discussion about the basic differences between the technical, or 'surface', methodological approaches and the 'under the surface', or critical, approach of this research. The critical methodological approach in this thesis is linked to a broad understanding of how the social context, in this case the educational computing policy context, operates. In contrast to the more common technical approaches used by much of the research in these areas, the important considerations in this thesis are linked an explicit and considered set of theoretical assumptions about the nature of educational computing, policy analysis and history, including the nature of ideology and discourse and the role of the state in education policy. The outline of the critical methodological approach used in this thesis is undertaken through a series of summary critiques of the dominant research approaches relevant to this thesis. These areas include educational computing; New Zealand's educational history; and policy analysis.

'Surface' technical and 'under the surface' critical approaches

Much of the educational writing on educational computing, policy analysis and history is of a descriptive or technical nature. While this information is useful in providing a sense of what has, or has not, occurred in certain situations, it does

not always provide a deep or thoughtful insight into important events. In this manner, this research seeks to understand more about the social and political context of educational computing policy and go beyond the surface supplied by so many discussions of New Zealand's educational computing, policy analysis and history.

In describing as technical, much of the New Zealand, and international, literature on educational computing, policy analysis and history this chapter makes a broad methodological connection between quite diverse areas. Educational computing, history and policy analysis have quite separate disciplinary features. The literature on educational computing for instance, usually discusses the psychological and pedagogical issues connected with computer use in the classroom. Educational policy analysis has a diverse range background and may include a discussion about any range of issues connected with the development and/or implementation of educational policy. Educational history encompasses a variety of issues, such as the development of particular approaches to teaching and learning and the biographies of important teachers or theorists.

What connects much of this diverse educational research is a particular set of philosophical and methodological points of view about the socio-political context. As John Clark has stated, a majority of the textbooks on how to carry out educational research contain a "total absence [of] any thought that educational research exists in a social-political-economic context".[1] The effect of such an exclusion is to provide research which, while it may be useful in answering specific questions, struggles to make sense of the overall dynamic that is education or education policy. As a result, much research in educational computing, policy analysis and history is focussed on answering specific technical questions and/or 'describing' events, as opposed to understanding the broad range of factors which might give rise to a given situation. For example educational computing might be interested in the qualities of certain educational software. Educational history might be interested in outlining key curriculum

[1] J.C. Clark (1997). *Educational Research: Philosophy, Politics and Ethics.* Palmerston North: ERDC press pp ii.

developments. Policy analysis might be concerned with how a government policy could involve the bureaucracy. In themselves these may be worthwhile research topics, but the methods that help provide information for these topics are unlikely to provide the holistic analyses of the educational policy context sought by this thesis.

At least in part, this bias towards technical research appears to be linked to Western civilisation's false assumptions about the value of physical science methods in carrying out the work of social science. While technical approaches to research and policy analysis, especially those relying on physical science-type methods, can deliver quantified (or descriptive) estimations of events, but they also tend to produce decontextualised, depoliticised and overtly linear relationships about events within the research context. In favouring quantitative measures technical approaches also have some difficulty in analysing those difficult to measure notions such as 'culture', 'politics' and 'ideology'. In many cases these concepts may actually fail to be understood as 'knowledge' leading to a rather bland, superficial and false ontology, or understanding of the world.[2] Hence it may be that in attempting to understand an educational policy problem a technocratic policy analyst is likely to, not only shy away from the context, but also start an analysis of the policy-problem and context with a statistic:

> 35% of Maori students leave school with no formal qualification compared with 15% of non-Maori students[3]

Undoubtedly the policy problem related to Maori education is much more complex than the above statistic. A critical approach would likely start with the "continued socio-economic marginalisation of Maori people in wider society"[4] it is also likely attempt to understand a range of historical and contextual relationships in building a more holistic and 'critical' policy understanding.

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[2] J.J. Prunty (1985). Signposts for a critical educational policy analysis. *Australian Journal of Education.* 29 (2), pp133-144.

[3] Ministry of Education (1993). *Education for the 21st century.* (Discussion document). Wellington: Learning media.

[4] G.H. Smith (1991). *Reform and Maori educational crisis: a grand illusion* Auckland: Research Unit for Maori Education, University of Auckland.

This broad and considered approach is taken here to New Zealand's educational computing policy. It is an approach, which assumes that the socio-political context of educational computing is understood, including the various points of view operating within this context. It needs to weigh up how they operate and developing an analytical picture that provides insight into 'how' or 'why' a situation is such as it is – and not just seeking to describe, and narrowly interpret, what can be directly observed or measured. As a result this approach is more cautious when it comes to 'neutral facts', dominant ideas, received knowledge or 'common sense'. As the title to this chapter sets out, the approach in this thesis is one that goes beyond the surface of events to understand the nature of the socio-political and historical events.

Educational computing

A high proportion of the educational computing research literature is made up of 'how to', celebratory and techno-optimistic approaches to computers and the classroom. There is very little critical commentary concerning the history of educational computing, with many of the historical points of view presented in the various forms of research dominated by 'rise and triumph' perspectives about technology and its role in education.

The presentation of optimistic approaches to educational technology are not necessarily the product of a naïve past. Observe how the words of Apter and Eadie, separated by over 30 years of educational research, make comparable points in downplaying the ineffectiveness of educational technology (to date) and sounding up its future.

> Although new devices for information storage and transmission have been in existence for some years, including moving films, television, tape-recorders, gramophones and computers we still make very little use of them in the classroom....
>
> Fortunately new techniques are at last beginning to be tried out at all levels of education, and it seems likely that the results of these trails will revolutionise education, and set a pattern which will have a long-term influence on the future development of education... [5]

My research revealed that, although some classrooms remain apparently

[5] M.J. Apter (1968). *The new technology of education.* Melbourne: Macmillan pp7-8.

> untouched by technology, many classroom configurations have changed to incorporate easy access to the computer(s) and to facilitate the discussions, problem solving and decision-making that inevitably follow their use.
>
> Schools in my research group made a number of differing responses to ICT.[6]

Noticeably neither writer suggests ***why*** there has been very little use made of educational technology in some classrooms. While some educational computing has attempted to understand the historical let-down of educational technology, it is rare to see an examination provide genuine insight into this phenomena. A critical approach, drawing upon an analysis of the social context, investigates why such success has not been more widespread and provides a more informative inspection of computers and educational change. Such critical comment is rare and the work of Apter and Eadie continue to be examples of the dominant approach for educational policy and practice.

The educational computing policy and history

While a few writers have developed critical *historical* material around educational computing policy, no other country has published a critical history of its educational computing policies. The critical material that exists dates from 1969 when A.G. Oettinger provided an important, initial critique of educational computing in the United States. The points made by Oettinger have contemporary parallels to the ideas raised in this thesis. For instance Oettinger discussed the failure of computers to live up to the rhetoric of reformers:

> ...educational technology has not reformed – much less revolutionized education as dispensed in our schools. ... Numerous economic, institutional, intellectual, and technical barriers account for this failure.
>
> ...Current attempts to integrate technology and education are dominated by faddish orthodoxy.[7]

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[6] G. Eadie (2001). *Schools for the Future: The Impact of ICT on Schools: Classroom Design and Curriculum Delivery*. pp11 as sourced on 5 February 2006 from http://www.tki.org.nz/r/ict/pedagogy/churchillreport.pdf.

[7] A.G. Oettinger (1969). *Run computer run* Cambridge Massachusetts: Harvard University press pp215.

Oettinger also pointed out the lack of critical awareness of research and policy, while also explaining the links between educational computing policy and the economic ideas of policy makers:

> The U.S. Office of Education's new policy-research centers are given little scope for imagination. One is charged mainly with preparing "an inventory of knowledge of human potentialities for growth and development". Another has been asked to "forecast probable roles of teachers, counsellors, and administrators in education in 1988." The tasks of the others include studies of the economic consequences of changes in educational policy" and of "long term implications of rapid technological change for society, manpower needs and education."[8]

Similarly Oettinger also referred to the scepticism that should be brought to bear on educational computing companies:

> Much of the glowingly advertised educational hardware and software is made by the same kind of companies and serviced by the same kind of servicemen that are responsible for your washing machine, your television set, your record player, your typewriter, and other relatively complex mass-produced items.[9]

The work of both Larry Cuban[10] (2002) and Neil Selwyn[11] (2002) stand out as important contemporary writers on educational computing policy. Cuban's book *Oversold and underused: computers in the classroom* describes the way educational technologies have suffered from excessive hype and had limited success in supporting student learning. While Cuban's book is more concerned with classrooms than Federal policy, he draws attention to the movements in America away from (liberal-) progressive education and towards the involvement of business and more 'economically-driven' approaches to education. Cuban also notes the repeated failure of educational computing to reform schooling in the ways envisioned by reformers, and instead notes that "when teachers adopt technological innovations these changes typically maintain rather than alter existing practices".[12]

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[8] Ibid pp217-218
[9] Ibid pp175
[10] L. Cuban (2001). *Oversold and underused: computers in the classroom.* Cambridge, Mass: Harvard University Press.
[11] N. Selwyn (2002). Learning to Love the Micro: the Discursive Construction of 'Educational Computing' in the UK, 1979-1989. *British Journal of Sociology of Education* 23 (3), pp427-443.
[12] Cuban (2001), pp71.

Neil Selwyn has, for instance, discussed how, during the 1980s, the computer was constructed as an "inherently educational" tool in the United Kingdom. He has explained how computer companies operated at this time, for their own advantage, and the vocational conceptions that were developed of education and educational computing. Selwyn's analysis suggests that computer companies, rather than students, have had a disproportionate degree of success in educational computing and draws attention to the need for educators and policy makers to provide more careful consideration of how educational computing policy is developed.[13]

Historiography and the history of New Zealand education

Until the 1990s New Zealand's educational history generally followed what has become known as a 'liberal'[14] path. One of the main assumptions of these liberal historians was that the development of state education was inevitable and ultimately unproblematic.[15] There have been a few exceptions to the liberal approach, including the revisionist work of Roy Shuker in the 1980s[16] and, more recently, in the more critically-based work, seen, for example, in the work of Roger Openshaw and Gary McCullough. In the context of this thesis these more recent critical, approaches provide a much more fitting model for the methodology of this research than those of either the traditional liberal or more dogmatic revisionist approaches.

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[13] Selwyn, N, (2002).

[14] The term 'liberal', rather than technical, is preferred in educational history discussions because the emphasis in historical research is not normally quantitative, mathematical or technical (as a physical scientist might assert). but based around less 'technical' qualitative information. The term liberal also encapsulates the base political position of such historians most notably in terms of their understanding of objectivity and/or subjectivity. See G. Lee and H. Lee (1999). Essay review: reforming education, rewriting history. In M. Thrupp (Ed). *A decade of reform in New Zealand: Where to now?* Hamilton: School of Education, University of Waikato, for a critique of liberal historian's political point of view.

[15] R. Openshaw, G. Lee and H. Lee (1993). *Challenging the myths: rethinking New Zealand's educational history.* Palmerston North: Dunmore Press.

[16] R. Shuker (1980). New Zealand educational history: a revisionist perspective. *Delta* 27, pp38-47; R. Shuker (1987). *The one best system? A revisionist history of state schooling in New Zealand.* Palmerston North: Dunmore Press; J.H. Murdoch (1944). The high schools of New Zealand. A critical survey. *Educational Research Series* 19. Christchurch: NZCER. C. Whitehead (1974). The Thomas Report – A Study in Educational Reform. *New Zealand Journal of Educational Studies* 9 (1) pp52-64.

The liberal tradition in New Zealand educational history began in 1930 and the work of Butchers.[17] Butcher's developed his historical perspective against the assumed success of the development of the 1877 Education Act and the beginnings of compulsory schooling. His history of state schooling has been criticised for producing an unproblematic account of the past under the guise of an 'objective' survey.[18] Butchers presents a picture of the state education system that implies that there is a single or objective recall possible of the events leading up to the inevitable development of a National educational system.

A similar point of view is seen in Cumming and Cumming's 1978 *History of state education in New Zealand*[19] This work presents a quintessential example the 'rise and triumph' educational history, with the development of New Zealand educational policy characterised as an inevitable good, albeit with the occasional well-intentioned error. Openshaw has drawn attention to the following Cumming and Cumming statement:

> Mistakes have been made, there have been differences in opinion and changes in policy, but always men in authority have acted with the best of intentions.[20]

The publication of Shuker's 1987 book *The One Best System? A revisionist history of state schooling in New Zealand*, has offered a leftist critique of the approaches favoured by Cumming and Cumming. Shuker draws heavily on ideas about ideological hegemony from the Italian Marxist Gramsci and, rather than tacitly accepting the dominant educational ideology of the time, Shuker develops a more explicit political history. Included in Shuker's perspective is the idea that instead of serving as places of social mobility, schools have acted as supporters of the unequal distribution of power in New Zealand society. Indeed far from being an uncritical good, schooling has operated in the interests of the status quo.

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[17] A.G. Butchers (1930). *Education in New Zealand; an historical survey*. Dunedin: Coulls Somerville Wilkie.
[18] Openshaw, Lee and Lee (1993).
[19] A. Cumming and I. Cumming. (1978). *History of state education in New Zealand, 1840-1975*. Wellington: Pitman.
[20] Cumming and Cumming, (1978), cited in Openshaw et al, (1993) pp12.

Shuker's (1987) work is a very valuable piece of history and it offers a number of insights as it questions previous liberal versions educational history. However, there are important criticisms to make of the revisionist approach he draws upon. This criticism centres on the use of overuse of social theory at the expense of historical data. As Openshaw, Lee and Lee. note of the revisionist approach generally, historians need to be careful about using history as a footnote to theory.[21] And, as McCulloch has also noted, the overuse of theory by Shuker may miss the realities of the resistance to educational policy and the overarching structures of inequality by people in and around the education system.[22] In short, Shuker's approach to history may be too structured by theory and therefore too deterministic.

A methodological solution is therefore sought between the 'rise and triumph' approach of the liberal historians and the determinism of a revisionist approach. Such an approach should not overtly structure the context in terms of particular political points of view. It should also attempt to carefully build the available evidence into a detailed analysis of the contradictory and complex social dynamic. *The school curriculum in New Zealand* (1992) edited by Gary McCulloch shows such an understanding. The approach used in McCulloch's work is especially interesting because of the way it positions and understands the different ideological constructs contesting educational ideas.

> Together these notions feed into a broad notion of 'curriculum history' in which the curriculum is treated as a social and political construct.
>
> At the same time they encourage a view of the curriculum as a contested arena in which different social, cultural and political groups have sought their own ends.[23]

In some ways the approach to the context used by McCulloch is still explicitly theoretical. However, in contrast to the approach taken by Shuker, McCulloch's theoretical standpoint is more flexible and dynamic. Whereas Shuker drew upon explicitly Marxist roots, McCulloch's point of view disperses the power structures and points of view surrounding education and is prepared to analyse

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[21] Openshaw et al (1993).
[22] McCulloch cited in Openshaw et al (1993).
[23] G. McCulloch (Ed) (1992). *The school curriculum in New Zealand: history, theory, policy and practice.* Palmerston North: Dunmore Press pp11.

the variation and lack of pattern that may be apparent. The summarised methodology can be presented as requiring rigorous theoretical and empirical work.[24] The research presented in this thesis uses a similar methodological approach. While providing an explicit theoretical framework, in terms of the educational context, the role of the state and the nature of educational research, it also allows for a structuring of the variety of ideas and ideologies, in a way that sees the policy context as a competitive arena with a variety of policy possibilities. Conveniently this reflects the potential of technology to affect the social and political context in a variety of predictable and unpredictable ways.

Although an approach drawing upon rigorous theoretical and empirical work is likely to be more considered than previous methodological approaches, this approach should still be understood against the ongoing success of the traditional, liberal approach to history. While not widely endorsed in by many university-based educational historians, the 1998 work of Graham and Susan Butterworth in *Reforming Education: The New Zealand experience, 1984-1996* was commissioned by the New Zealand government and is widely relied upon by many other academics and government officials to explain previous events in education policy.[25] This, despite the fact that *Reforming Education: The New Zealand experience, 1984-1996* has been criticised for its claim of 'independence' and its heroic characterisations of politicians and senior public servants.[26] Admittedly, as Lee and Lee note, the Butterworths do at least acknowledge that they speak from an "insider's" point of view, but this acknowledgement simply serves to justify the bias in their work, rather than to actually inform an analysis of the context in which the government reforms occurred.[27] The subjectivity that may occur with "an insiders" point of view is

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[24] Nash cited in Openshaw et al (1993) pp13.

[25] See for instance L. Perris (1998). Implementing education reforms in New Zealand: 1987-97. Report to the World Bank as sourced 19 May 2004 from http://www1.worldbank.org/education/globaleducationreform/pdf/perris.pdf and G. Hawke (2002). *Education reform: the New Zealand experience*. Presentation to the New Zealand trade consortium as sourced 19 May 2004 from http://www.nzier.org.nz/SITE_Default/SITE_Publications/x-files/1323.pdf.

[26] G. Lee and H. Lee (1999). Essay review: reforming education, rewriting history. In M. Thrupp, (Ed). *A decade of reform in New Zealand: Where to now?* Hamilton: School of Education, University of Waikato.

[27] Ibid

such that it functions in a similar way to the work of Butchers – failing to take account of the social and economic contexts of education and legitimising the received version of events. Indeed like Butchers (1930) work, the Butterworths overstate the ability of facts to speak for themselves and underestimate the extent to which their own subjectivity and ideology has shaped their perspective.

Educational policy analysis

While educational history in New Zealand has been dominated by liberal interpretations, the political equivalent in educational policy analysis is the technicist or technocratic approach. A technocratic approach to policy analysis centre on the attempt to develop objective policy advice and policy alternatives for policy decision makers. Technocratic policy analysts strive for (a Newtonian) disinterested observer status as particular neutral and value measurable forms of data, such as cost-benefit analyses, outcome measures and control group testing provide the knowledge from which decisions can be made.

A key assumption therefore structuring technocratic policy analysis involves the separation between information gathering and decision-making, between the realm of knowledge (policy analysis) and of values (the politician). This dualist, positivist and/or naïve empiricist[28] approach has been criticised for an artificial separation between fact and values, theory and practice and assumes; and like some conceptions of physical science, it is questioned for assuming that there can be observation without prior conceptions or ideas. As Martin Rein summarises:

> Not only are there no facts independent of the theories that organise them but there are no facts independent of the methods we use to describe or account for the theory we advance. Both the theory and the methods we use depend on our purposes, from which we can infer our values.[29]

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[28] J.C. Clark (1997). Educational Research: Philosophy, Politics and Ethics. Palmerston North: ERDC press.

[29] M. Rein (1983). Value-critical policy analysis in D. Callhan and B. Jennings (Eds) *Ethics, the social sciences and policy analysis.* New York: Plenum press pp93.

Technocratic approaches to education policy have become dominant or hegemonic in New Zealand education policy since 1987.[30] As is argued in more detail in *Chapter Six* of this thesis, the Treasury's 1987 education brief to the incoming government was a watershed in the development of a technocratic hegemony. It also provides a fitting example for this discussion as the superficially objective and empiricist approach connected with the Treasury production of this document has also provided a powerful vehicle for quite subjective and questionable economic points of view about education and society. As Boston et al note Treasury's brief to the Government on education *Government Management Volume II: Education Issues* makes quite reductionist links in discussing the role and function of education. Boston et al carefully examine, for instance, the links made by *Government Management Volume II* between expenditure, education and economic growth, as it argues against the increasing expenditure in education. Boston et al suggest that the objective and technical links made by Treasury, are not only unsustainable, but also support its view on government expenditure or, indeed, its assumed and "preferred ideological position".[31]

In a similar way, Peters and Marshall have noted how the neo-liberal construction of human nature, is implicit within the policy that restructured schools at the end of the 1980s: *Tomorrow's Schools.* The 'autonomous chooser' is a rational, utility-maximising individual making choices for his (or maybe her) best interests. As Marshall and Peters suggest, such an economic individual, represents a functionary of market logic, and its limited subjective market-based assumptions about what passes for human nature. Yet this is the explicit point of view within one of the key policy documents that informed the *Tomorrow's Schools* policy: *Administering for Excellence.*

> Consumers need to be able to directly influence their learning institution by having a say in the running of it or by being able to turn to acceptable alternatives. Only if people are free to choose, can a true co-operative

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[30] P. Fitzsimmons, M. Peters and P. Roberts (1999). Economics and the educational policy process in New Zealand. In M. Thrupp (Ed). *A decade of reform in New Zealand education: where to now?* Hamilton: School of Education, University of Waikato. See also J. Boston, B. Haig, and H. Lauder (1988). The third wave: a critique of the New Zealand Treasury's report on education. Part II. *New Zealand Journal of Educational Studies* 23 (2) pp115-143.

[31] Treasury (1987). pp139.

> partnership develop between the community and learning institutions ... choice will involve providing a wider range of options both for consumers an learning institutions[32]

The approach in this thesis is to assume that human behaviour is much more complex than market logic. There is also a complex variety of factors affecting the schools children end up attending, extending well beyond the rationalism of the market model set out above. The analysis of *Administering for Excellence* is also not prepared to sacrifice its market faith to consider the way markets have favoured those in the best position to exercise choice, more commonly those wealthier urban parents, with the resources to transport their children to schools, and those wealthier urban schools that can turn undesirable students away.[33]

Besides the ability to envelope its subjectivity within an ostensibly scientific approach to policy, technocratic policy approaches have two other important ramifications for critical policy analysis. The first of these is connected with the how the State is considered. There are two basic conceptions of the State that might be held by a technocratic policy analyst, and depending on the situation, these different points of view might apply. The first, more simple point of view, simply defers from any analysis of the policy context and sees the State as a neutral agent. Within such an approach the State is a benevolent black box simply attempting to implement "whatever it chooses to do". This is essentially an extrapolation of the dualist tendency in technocratic policy analysis in keeping the science and the values apparently separate. In other words policy analysis stays outside of the political process and remains the technical and bureaucratic servant.

Alternatively, technocratic policy analysis also draw upon the idea of 'provider capture', as borrowed from Public Choice Theory. Public Choice Theory suggests that politicians, teachers and bureaucrats operate to maximise their

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[32] M. Peters and J. Marshall (2004). The politics of the curriculum: autonomous choosers and enterprise culture pp120 in A-M. O'Neill, J. Clark and R. Openshaw (2004). *Reshaping culture, knowledge and learning? Policy and content in the New Zealand curriculum framework.* Palmerston North: Dunmore Press.

[33] H. Lauder (1994). *Trading in futures: the nature of choice in educational markets in New Zealand: the Smithfield Project*. Phase one, Third report to the Ministry of Education, Wellington.

own utility and can not therefore be trusted to make the 'correct' (economic) decisions about education policy.[34] This point of view is an extension of the 'autonomous chooser' discussed by Marshall and Peters and lacks any convincing method for understanding the more complex motivations of humanity.

An alternative critical theory of the State has been theorised by Claus Offe. This approach is favoured in this thesis because it posits a more dynamic and contextual understanding of the State than that provided by Public Choice Theory. This theoretical position sees the role of the State's in terms of three broad, but potentially contradictory, forces. Roger Dale refers to these as:

- State support of the capital accumulation process;
- the State guaranteeing the context for its continued expansion; and
- the legitimisation of the capitalist mode of production, including the State's own part of in it.[35]

While there are Marxist links to Offe's work, this approach is not a deterministic framework for considering the state. Dale notes, for instance, the diverse ways in which the State has supported capital accumulation, such as through a Keynesian or Monetarist macro-economic framework. There is therefore a high degree of flexibility built into this understanding of the state and the way the State variously respond to policy. In New Zealand this has been seen most dramatically with the shift from the interventionist policies of Robert Muldoon to the free-market approach of the fourth Labour government.

The flexibility of this model can also be seen in relation to the sorts of choices faced by the state in education policy. For instance the State may be faced with a dilemma of spending more on vocational education or reducing class sizes; or it may want to build a skilled "IT" workforce, whilst also being reluctant to provide schools with public expenditure to meet such goals. It is not clear how

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[34] R. Shaw (2000). Model without a cause: public choice and bureaucratic reform in New Zealand. *New Zealand Sociology journal* 15 (2).
[35] R. Dale (1989). *The state and education policy*. Milton Keynes Philadelphia: Open University Press.

the state will resolve this choice and there are many factors that will support one point of view over another.

In this manner, there is a lack of predictive power in the theoretical framework put forward here by Offe.[36] The explanative power of this framework comes from the way in which it helps frame the policy developments of government, and in how these decisions are contextualised. In this sense this framework provides a basis to examine the social and political context in all its details without being overwhelmed by the various forces and ideologies at work. It reminds us not to look for simple answers and to explore the different and varied forces that can underpin the state's rationales. It allows us to carefully consider educational rationales within policy contexts that include escalating government debt or policies that bind the education system to the country's economic outcomes. These are the levels where educational computing policy contradictions are played out by the State, and with this framework it is possible to critically comment within a complex and dynamic educational and political context.

This detailed and contextual understanding is the basis to the approach used in this thesis. Within a more detailed and contextual approach, the policy context is characterised as competitive arena made up of a wide range of variously competing, contradictory and cooperative ideologies, rationales and forces that shape policy-makers interpretations, subjectivities and points of view.

The idea of discourse is more useful and flexible in this context than ideology. Whereas ideology suggests a broad political idea, discourse, in this history, refers to a wider range of ideas, actions and subjective points of view. Discourses operate on more levels than ideology is usually thought to operate, they operate in competition with one another and encompass ideology, but extend out to subconscious points of view on the one hand, and subjective notions of common sense on the other. This idea of discourse is based on the

[36] Ibid

work of the French poststructuralist Michel Foucault.[37] Specifically Foucault's understanding of discourse, links language and organisational practices to knowledge, or more accurately knowledge/power. Discourses are the words and actions that create subjectivities, points of view and social control. Discourses legitimise what can be said about a topic and they surround and define what counts as an acceptable point of view. In this sense discourses help shape our actions, both consciously and unconsciously.[38] Discourses operate simultaneously and in competition with one another as they make up the social context. Discourses allow for a plurality of meaning or subjectivity to exist, which is dependent on a person's point of view.[39] Hence in relation to the historical approach taken here and the role of the State used in this thesis, this utilisation of discourse, and its application through discursive analysis, offers a way to track, evaluate and weigh against each other, the various discourses operating within the policy contexts over time. This theory of discourse therefore operates as a balance to the broader descriptive attempts of the ideas put forward by Offe and Dale. Used together critically they allow for the rigorous theoretical work that should accompany the rigorous evidential work in this thesis.

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[37] J. Kenway (1990). Education and the Right's discursive politics: private versus state schooling. In S.J. Ball (Ed) *Foucault and Education*. London: Routledge pp167-206.
[38] Ibid
[39] J. Codd (1988). The construction and deconstruction of educational policy documents. *Journal of Educational Policy*. 3 (3), pp235-247.

Chapter Four

From 'new maths' to first contact (1960-1979)

In November 1960, 11 years before Christ's College installed the first computer into a New Zealand secondary school, the New Zealand Treasury installed New Zealand's first ever computer – the IBM 650. The IBM 650 was capable of adding or subtracting in 1.63 milliseconds; it could multiply in 12.96 milliseconds, and divide in 16.90 milliseconds. Its memory system was based around a rotating magnetic drum with a 2000 word capacity and a random access time of 2.496 milliseconds.[40] The IBM 650 was used to work out the new PAYE tax system for the salaries of 34,000 public servants. In addition it was anticipated that it would assist with the Treasury's accounting processes as well as supporting a number of other government departments including the Department of Scientific and Industrial Research (DSIR), the Meteorological office, the Inland Revenue Department, the Electricity Department and many others. The IBM 650 cost £73,000 per annum to hire, £56,000 to install and its running costs were £75,000 per annum. On the plus side it was estimated that it would 'save' 130 positions and £195,000 per annum. As events developed, the other government departments did not receive access to the IBM 650 and it achieved little more than assist with the salaries of public servants and generate of an enormous amount of heat (equivalent to 80 one-bar heaters[41]). By October 1962 Treasury reported to the Minister of Finance that the IBM 650 was "outmoded".[42]

While Christ's College was the first school to have a computer, Treasury's IBM 650 represents is an important milestone. Treasury's IBM 650 represents the first government computer project, and also the first government computer

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[40] Columbia University in the City of New York *The IBM 650 Magnetic Drum Calculator* as sourced14 July 2003 from http://www.columbia.edu/acis/history/650.html.

[41] A.C. Shailes (1985). The impact of computers on the public sector. In W.R. Williams, (Ed) *Looking back to tomorrow: a survey of the impact of the first twenty-five years of the use of electronic computers in New Zealand together with some thoughts for the future.* Wellington: New Zealand Computer Society.

[42] C. Beardon (1985). *The information revolution in New Zealand.* Auckland: Reed Methuen pp7.

project, which failed to deliver on its promises. Ironically it did not take long before Treasury were looking towards 'the next big thing' in computer technology. In a broader sense there is also an historical irony at work in this starting point, as the Treasury, after 1987 especially, later influenced the government's move to a more instrumental and skills-based approach to education in the 1990s and beyond.

In terms of the structure of this thesis, beginning the chronological narrative in 1960 provides an opportunity to discuss the educational context leading up to the first educational computing policies. It was not until 1974 that the first educational computing policy from government was developed, although secondary schools were teaching about computers from the mid to late 1960s. This policy saw the development of an optional computing section in the seventh form Applied mathematics course, and although it did take several years to produce, it was not a comprehensive educational computing policy. Overall, it was the economic and educational events within the educational policy context that are more important for this history.

After a brief outline of the social, economic and political context of 1960 to 1979, this chapter divides the large time-frame of this chapter into three periods. These three sections focus on the instrumental, economic ideas in the educational context, not so much because of their importance at this time, but because of their importance for the subsequent educational and educational computing policy developments. This chapter notes the influence of key economic ideas, on educational policy, well before the development of the neo-liberal reforms from 1987 onwards. In this sense the findings of this chapter reflect the point made by Openshaw, that the ideologies of the *Tomorrow's Schools* policy had an historical basis and did not just emerge, ready-made in the mid-1980s.[43]

The three periods consider are the years from 1960 to 1966, 1967 to 1971 and 1972 to 1979. The period from 1960-1966 predates school computing activity,

[43] R. Openshaw (2003). Preparing for Picot: Revisiting the "Neoliberal" Educational Reforms *New Zealand Journal of Educational Studies* 2003 2.

but there were two important events at this time relevant to educational computing policy. These events were the Currie Commission and the introduction of an important fore-runner to educational computing, 'new maths'. The second section of this chapter examines the 1967 to 1971 period when the first school activity with computers takes place and the first computer was installed in a New Zealand school. The first school computers were scarcely more advanced than an electronic calculator and were introduced to the secondary school classroom through mathematics and 'computer programming'. The first educational computers also brought with them techno-advocates who made links between the technological functioning of new computers and the need to prepare students for the (economic) world in which computers were being utilised. Interestingly the idea of using computers as a tutor or teaching machine was not favoured at this time. While such an approach had become somewhat popular in the United States[44] the cost of computers and the educational theory underpinning this approach probably prevented similar wide-spread use in New Zealand schools. Instead, the first contact with educational computers in New Zealand was shaped by liberal-progressive concerns for education. Alongside the development of computer programming courses (to support cognitive development) there were computer awareness courses and efforts to teach students about the sociological implications of computers, such as employment and privacy.

The third section of this chapter, covers the from 1972 to 1979, and aside from the computing curriculum developments in Applied mathematics, this section concentrates on a number of important historical developments relevant to subsequent educational computing policy. These developments included the Education Development Conference and the significant economic events of this period. Between 1972 and 1979 these economic events included the oil shocks; Britain joining the European Economic Community (EEC); and an increase in both inflation and unemployment.[45] These events placed the government under pressure and provided something of a platform for the future changes to New

[44] A.G. Oettinger (1969). *Run computer run.* Cambridge Massachusetts: Harvard University press.

[45] P. Briggs (2003). Looking at the numbers: a view of New Zealand's economic history. Wellington: NZIER pp98.

Zealand's economic policy, and indeed the extent of the economic policy domain. During the 1970s however, economics did not overtly influence education policy and the Fraser/Beeby educational ideology remained dominant, both for education and for education involving computers – at least for now.

The social, economic and educational context 1960-1979

Between 1960 and 1979 New Zealand underwent dramatic economic and social transformations. The prosperous years from 1950 to 1966 preceded a decline in the growth rate, an increase in inflation, a decline in balance of payments and growing unemployment. By the early 1970s New Zealand had moved from agricultural security, to trade insecurity. Britain joined the European market and oil shocks helped make energy an expensive proposition. Inflation and government debt became topics for public discussion from 1975 onwards and there was increasing concern about New Zealand's future.[46]

During the 1950s New Zealand followed an economic policy based around full employment. As the external economic factors impacted upon New Zealand, this policy could not be sustained. From 1960 to 1979 unemployment became a significant economic and social concern. Before 1966 there had been high levels of agricultural trade and virtually no unemployment. The government, through its status as employer, had even used operations such as the Railways Corporation to create additional employment if the need arose. The government also manipulated the economy through controlling the exchange rate, tariffs and licences on imported goods and provision of various subsidies, especially to the agricultural sector. Eventually these policies did not provide the same safeguards they had offered originally and unemployment started to track upwards from 1966 to 1979.[47]

In the social context, feminism found New Zealand and questions were raised about matters such as the traditional domestic arrangements and women's right to equal pay. New Zealand controversially contributed to the Vietnam War and

[46] B. Easton (1982). *External impact and internal response: the New Zealand economy in the 1970s and 1980s.* Wellington: NZIER
[47] Briggs (2003)

many members of the public started to question whether the All Blacks should be playing rugby with South Africa. In 1975 the Waitangi tribunal was established as Maori had also started to more obviously assert their rights of sovereignty. Television, and the start of a process that would see global images beamed into our very homes, started, coincidentally in the first year a computer arrived in New Zealand – 1960.

Television provided some interesting futuristic images of computers through such programmes as *Star Trek* and *Lost in Space*. These images did not prevent computers also being the subject of public concern in this period. With unemployment reaching 2% in 1979 the rise in technology was often linked to the loss of jobs to technology. Such was the concern that in 1979 a large seminar was held in Wellington, to specifically discuss the displacement of workers by computers.[48] Computer crime and personal privacy issues were also a concern as the data-basing of people's details led some commentators to question how such information could be used by unscrupulous individuals, governments and corporations in the future.[49] The development of the Wanganui computer system provoked the 1974 Listener article by Auckland university law lecturer, Francis Auburn about the "threat to the future" posed by computers.

> [The Wanganui computer] is presumably modelled on United States systems, which is one good reason for fearing abuses.[50]

The period from 1960 to 1979 has been characterised as a time dominated by liberal-progressive approaches to education. Under a liberal-progressive approach education was linked to egalitarianism, equality of opportunity and the need to develop well-rounded citizens for a democratic state. Such an approach has been strongly linked to the famous words of Peter Fraser spoken in 1939:

> The government's objective, broadly expressed, is that every person, whatever his level of academic ability, whether he be rich or poor, whether he live in town or country, has a right, as a citizen, to a free

[48] Public Service Association (1979). New technology and New Zealand's future. *PSA journal* 66 (9) pp14
[49] K. Findlay (1976). The great computer fraud. *NZ Listener* July 24 1976 pp19
[50] F. Auburn (1974). The computer threat. *NZ Listener* August 10 1974 pp12

> education of the kind to which he is best fitted, and to the fullest extent of his powers.

While this was dominant policy point of view at this time, there were also other approaches to education policy. These other view-points are a reminder that this period was not simply a liberal obelisk, but a discursive contest, where different ideas about education operated within an overall educational dynamic. This context included conservative forces, such as those connected with a 'back to basics' approach to education as well as an instrumental focus on education and an increasing emphasis on the vocational aspects of education. These ideas are set out in more detail in the following sections. They provide an important baseline for considering the changes that later occurred to the education context and for considering how the first educational computing developments were conceived by educators and policy-makers and how these ideas came to alter over time.

The Currie Commission, 'new maths' and the first New Zealand computers 1960 – 1966

Although the DSIR never got to use the IBM 650, computers became established in other sectors of the economy including private enterprise, public service and tertiary education. Computers were installed at Canterbury University and Griffin & Sons in 1961; they were installed in the New Zealand Railways, the Department of Education and Department of Statistics in 1962. L.D. Nathan, Shell, Air New Zealand, Gough, Gough and Hamer, Tasman Pulp and Paper, the Broadcasting Council and Auckland University had computers by 1963, and by 1965 there was an estimated 70 computers in New Zealand.[51]

Very little school or policy educational computing took place during the early 1960s although newly trained teachers from this time were entering secondary schools and, according to a Department of Education official at the time, were probably finding ways around the exam prescriptions to introduce to their students some of what they had recently learnt.[52] It was still several years before the Department of Education introduced any policy for educational computing

[51] Beardon (1985). pp7-8.
[52] B. Werry (1981). Computers in New Zealand secondary schools. *Education* 3, pp8-12.

and in many respects the years 1960-1966 are the last of the computer-free years in compulsory education.

Outside of teacher training, there were two other relevant events in the educational policy context at this time the so-called Currie Commission and 'new maths'. The first of these, 'The Commission on Education in New Zealand', was chaired by Sir George Curry and was an extensive exercise in the educational policy context. It published its approximately 900 page report in June 1962. This report discussed almost every aspect of the New Zealand education system. The work of the Currie Commission is often regarded as an endorsement of the status quo in New Zealand education.[53] In the opening of the first chapter the report sets out Peter Fraser's 1939 words as a framework for its investigation.[54] As David Scott has suggested the Currie Report held a "benevolent attitude ... towards ... a liberal-progressive and egalitarian [education] system", albeit an attitude which was managed by a bureaucracy intent on minimising dissent and maximising the potential for the appearance of wide-spread agreement of the status quo.[55]

The make-up of the Currie Commission provides the most obvious support for Scott's claims. The members of the Currie Commission were chosen by the Department of Education and included two future Directors of Education and an officer from the Department's policy unit. Liberal-arts graduates dominated the group and seven of the Commission had been, or were currently, teachers. Department of Education officers closely supported the members of the Commission, including Keith Sheen and Bill Renwick, who themselves went on to become Directors of the Department of Education. There was no representation on the Commission from iwi groups (iwi refused to even attend the Commission) politicians, economists, industry leaders, employer groups,

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[53] A-M. O'Neill (1996). Educational policy initiatives for girls and women: The transition from welfare state to market state. *Delta* 2, pp45-85; G. McCulloch (1992). Introduction. In *The school curriculum in New Zealand*. Palmerston North: Dunmore Press.

[54] Commission on Education in New Zealand (1962). Report of the Commission on Education in New Zealand [Currie] Wellington: New Zealand Government pp11.

[55] D.J. Scott (1996). *The Currie Commission and report on education in New Zealand, 1960-1962.* A thesis submitted in partial fulfilment of the requirements for the degree of Doctor of Philosophy, pp5.

scientists and religious leaders.[56] In this sense the Currie Commission was somehow almost certain to succeed at finding the general direction of New Zealand education at the time satisfactory.

Despite the loading of the Commission towards the status quo, there were other discourses presented in the Commission's report. These discourses can be observed in comments on the uncertain future facing New Zealand, the economic place of education and the changing role of New Zealand within the world. Openshaw has suggested that through their comments on such matters, the Commission took a defensive step in reasserting the national allegiance to Peter Fraser's 1939 statement:

> Nothing that has been said or written in evidence before the Commission has given any grounds for believing that there is in the community any large body of sentiment opposed to the ideas... nor in the 22 years since he made it has there been any movement – social or political – which would suggest any retreat from this viewpoint.[57]

The implication here is that if you disagreed with Fraser's statement you should consider yourself in a small minority (there was certainly no need to invite you onto the Commission). This defensiveness can also be seen in the other ways the Commission reinforced its traditional position and incorporated economic notions about the purpose and nature of education. From page three and four of the report comes this quote with explicit references to scientific advancement and a more veiled reference to the ambitious Japanese economy (among others):

> At the present moment, however, in all the countries of the world, there broods a new urgency regarding education. It is felt most strongly in the newly developing nations whose spectacular advances, political and economic, all find themselves ultimately dependent on advances in the education of their peoples. It is felt with hardly less strength in the older nations – and in education New Zealand may style herself old from European ancestry – since rapid material change and, in particular, rapid advance in scientific knowledge of every kind pose a new challenge to the schools and universities.[58]

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[56] Scott (1996)
[57] Cited in R. Openshaw (1995). *Unresolved struggle: consensus and conflict in New Zealand state post-primary education*. Palmerston North: Dunmore Press pp85
[58] Currie commission (1962). pp3-4

On page 25 there is also a comment about the uncertain economic future and an attempt to link education to overcoming this uncertainty:

> The Commission has had set before it a number of estimates of the economic future of this country. Because the shifts in the power relations of world economies, which are outside our control, it would appear that New Zealand faces years of adjustment and change demanding...other skills and knowledge.

There are many other such economic and future-based connections made in the body of the Currie Commission report. John Codd has suggested that there is a technocratic image of schooling pervading the Currie Report.[59] What is evident is that while instrumental or technocratic notions of education were not dominant or hegemonic at this time, they were certainly present. These were the sorts of forces that much later supported particular uses for computers in schools and also supported the development of an increasingly vocational approach to schooling.

New maths

In the early 1960s the development of 'new maths' was a curriculum fore-runner for educational computing. New maths involved a movement away from the mainstream arithmetic, rote learning tendencies of traditional core mathematics programmes and the rigid, abstract formalism of 'full mathematics' programmes. New maths sought a cognitive, comprehension basis to mathematics, focussing on student conceptual understanding and the application of more creative methods of mathematical inquiry. It gained its start in New Zealand through some Christchurch mathematics teachers who considered that basis of their teaching at university could be applied in a secondary education context.[60]

According to Openshaw, new maths attracted an energetic set of educators who were pivotal to new maths developing as an innovation throughout the 1960s.[61] Textbooks were published, conferences were held and secondary school

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[59] J. Codd, R. Harker. and R. Nash (1985). *Political issues in New Zealand education*. Palmerston North: Dunmore Press, pp26

[60] R. Openshaw, G. Lee. and H. Lee (1993). *Challenging the myths*. Palmerston North: Dunmore Press; R. Openshaw (1992). New Zealand secondary schools and the coming of the new mathematics. In *SAMEpapers*, University of Waikato: Longman Paul pp140-157.

[61] Ibid

schemes were re-written during this time of change for the mathematics curriculum. There were a number of reasons why this change took hold. The energy and personalities of the key staff was important. The teachers leading new maths mobilised departmental policy and were able to by-pass bureaucratic barriers. New maths also gained momentum through its links to the cognitive revolution and the thinking it sought to develop in its students. There were also links between new maths and developments in the economic, political and global context. These links meant that the new maths innovators were able to draw upon the rising set of uncertainties surrounding the increasingly technological future, including New Zealand's future, to justify Department of Education resources. In this way, New Zealand's rationale for new maths was somewhat borrowed from the United States, where new maths had been justified after the public crisis in American education brought on by the success of the Russian Sputnik programme. A Department of Education report in 1963 underlined this position:

> It is clear that we are on the threshold in far-reaching advances in the teaching of [science and mathematics] which have arisen partly from the changing needs of the modern world with its vast technological development[62]

Eventually the innovative ambition of new maths waned as 'back to basics' ideas, coupled with a widespread lack of professional acceptance and capability, limited the effectiveness of this innovation.[63] The feelings of parents and employers were relevant here as they conservatively responded to the new maths debate and the national anxiety about the economic problems of the early 1970s.[64]

The new maths innovation it provides an interesting case study in education policy. Both the Currie Commission and new maths reveal the complexity of the educational policy context and, despite the dominance of liberal-progressive notions of education, a variety of other philosophical notions supported, and then worked against, aspects of this dominance. Both the Currie Commission and

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[62] Openshaw (1992) pp143.
[63] Openshaw (1992).
[64] Ibid.

new maths utilised technological and economic rationales, alongside the liberal status quo. This situation framed the beginnings of educational computing, as the New Zealand economy continued to weaken and computers increasingly became part of New Zealand education.

The first educational computing in New Zealand 1967-1971

New maths also provided an innovative basis for the introduction of computers into the classroom. From the mid 1960s onwards innovative mathematics teachers introduced aspects of computing and computer programming to their students. Mathematics subsequently became the curriculum area through which the majority of New Zealand's initial educational computing took place.

According to Spence, there were other possible options for the introduction of educational computing including the use of programmed instruction across the curriculum, or by way of the closer examination of computers in the 'commercial' subjects.[65] But these alternatives did not achieve any significant status in New Zealand. As this section discusses, schools predominantly borrowed computer-time from businesses and Universities in this initial stage, and although techno-advocates suggested that vocational or instrumental uses of computers were important, the late 1960s and early 1970s was a context in which liberal-progressive notions of schools still dominated. Subsequently these first steps in New Zealand's educational computing were based around computer programming applications in senior secondary school mathematics classes, where the cognitive 'discipline' of computer programming outweighed the vocational rationales for students to develop commercial skills.

The work of Seymour Papert was especially influential in emphasising the cognitive aspects of computer programming. Papert's work was seen as a Piagetian-style way of developing logical minds and important general thinking

[65] R.J. Spence (1970). *Delimiting factors in computer education at the secondary school level.* New Zealand Computer Society (Inc.). Second National Conference Proceedings Volume II.

skills for problem-solving.[66] As then, mathematics teacher R.J. Spence sets out in 1968:

> Computer studies have particular relevance for general education because:
>
> Systems analysis provides a useful exercise in logical processes.[67]

This Piagetian or Papertian approach also reinforced the dominant educational philosophy of the time, in that computer programming was justified, not so much in terms of its direct, vocational usefulness, but more because of the inherent cognitive benefits it offered to New Zealand's growing 'citizens'. This perspective is also demonstrated in the writing of R.J. Spence who wrote a number of articles about computers in schools in the late 1960s and throughout the 1970s.[68] In 1968 for instance, Spence promulgated the argument for computers being included within 6th form Liberal Studies. The rationale for such an inclusion was to allow for teaching about the general social implications of computers, including such topics as "The computer and the citizen". In 1970 Spence continued the point by discussing the need for computing to take its place within the concept of a "broad general education" rather than any vocational imperative. His 1970 article about computers in secondary education even begins with an extensive discussion of educational philosophy. Spence links his ideas about computing with the work of the Currie Commission, Maria Montessori, Jack Shallcrass and Robert Hutchins. In referring to these commentators Spence suggests:

> Attitudes like these both contribute to, and derive from, a generally held belief that the purpose of New Zealand secondary education is broad personal development for effective citizenship[69]

Spence also drew support for his arguments about the broad nature of education from the 1952 UNESCO report on New Zealand education,[70] noting that such views were "held by the majority rather than a minority of New Zealand

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[66] See S. Papert (1970). *Teaching children thinking* (a paper to the IFIPS World conference on computers, Amsterdam); Spence (1970); R.J. Spence (1974). Computer in the classroom. *Delta* 14 pp40-44.
[67] R.J. Spence (1968). Classroom computer studies. *Data Trend* 4(10). pp13-15.
[68] For example Spence (1968); Spence (1970); Spence (1974).
[69] Spence (1970). pp75.
[70] UNESCO (1952). *Compulsory education in New Zealand* Paris, France: UNESCO.

educators".[71] Whether or not the expressed opinion of these educators would have always been maintained by their practice is another question,[72] but it is clear that Spence's ideas were shared by many others in education, including those within the Department of Education and the educational policy context.[73]

This liberal-progressive orientation also seems to have contributed to why computers were not commonly used for computer assisted instruction (CAI) and drill and practice computer programmes.[74] In an article about the variety of ways computers might be used in education, Spence refers to such processes as actually being outside of education, and belonging to the skills-based realm of training:

> Leaving aside computer assisted instruction and computer managed instruction (which have more to do with training than liberal education)...[75]

Writing in 1981, the point of view of the Departmental official Bevan Werry suggests that this scepticism about computer assisted instruction (CAI) was also evident in the policy context throughout this period:

> Many claims, some highly questionable, have been made for CAI: that it provides individualised self-paced instruction with immediate feedback to the learner; that the teacher can be freed for other classroom roles; that it ensures the application of what are termed "proven teaching methods" to all pupils at all times; that it changes the role of the teacher from adversary to guide or coach, and so on.[76]

Besides the Fraser/Beeby approach to education, there were other rationales surrounding the early stages of educational computing. Spence notes in 1970 the concerns of some teachers regarding the potential of technology to make the curriculum irrelevant. This was because of the time-lag between what is taught

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[71] Spence (1970) pp75.
[72] C. Whitehead (1974). The Thomas Report – A Study in Educational Reform. *New Zealand Journal of Educational Studies* (9) 1, pp52-64.
[73] See for example B. Werry (1981). Computers in New Zealand secondary schools. *Education* 3, pp8-12.
[74] These terms are used generally here to refer to those educational computing resources under the heading of Computer Assisted Instruction (CAI)., see Werry (1981). for a more in-depth discussion of how these terms were applied at the time.
[75] R.J. Spence (1976). Computers in liberal continuing education. *Continuing Education in NZ* 8 pp35-40.
[76] Werry (1981).

and what is used in the work place.[77] This fear is linked by Spence to vocational or instrumental ideas about education, rather than the idea of a 'broad liberal education'. Spence defends his position by suggesting that the principles of education are more important than any requirements for the workplace:

> The aim implicit in all programmes at this [secondary] level should be the education of future citizens rather than the training of future computer personnel.[78]

Spence's point helps to demonstrate the contested nature of educational philosophy as it was applied in the classroom. That is to say that besides the dominant liberal-progressive point of view for education, and education with computers, there were also more skills-based ideas about computers in the classroom. This discussion can be considered alongside the increasing amount of business contact with schools from the beginning of New Zealand's educational computing. While the Currie Commission devoted just one and a half pages to educational links with business, educational computing began in New Zealand schools because of such partnerships. Watties, IBM, Rothmans and the East Coast Farmers Fertilizer company are all business interests mentioned by Spence who became more interested in the computer work of schools.[79]

With the introduction of computers to schools, computing businesses had more scope to discuss how the curriculum should be developed. For example, Stuart Rose of IBM wrote in 1969 about the importance of computers in education. In his discussion Rose (who was himself an ex-teacher) mixes a social rhetoric with ideas about progress, economics and a concept he called the "New Educational system". The result was a blend of liberal ideas with tendencies towards the economic, technological and uncertain:

> The best answer to "why computers" questions is a social one. That much of our present scientific, commercial, political and social activity depends on the state of computer technology today is little understood, and less appreciated. Our progress as human beings has, and continues to be, accelerated as a result of computer applications. A small percentage of University students in New Zealand use computers, but in general their use is small in the New Educational system. For understanding of

[77] Spence (1970) pp76.
[78] Spence (1970) pp77.
[79] Spence (1968) pp14.

> the capabilities of computers to reach all levels of the population, studies must commence, at the latest, in the first stages of post-primary education.[80]

In another 1969 article, accountant Philip Harding suggested that business applications of computers meant that schools should develop the sorts of skills demanded by industries such as banking and finance.

> ...With so much interest being exhibited by computer users and allied organisations, the impact of this new technology on the school curriculum cannot be long delayed. To quote one example, any school leaver starting work in a bank today, will immediately meet some aspects of computer operations. [81]

Harding also conducted a survey of schools as part of this article. This survey found that computing courses faced school-based barriers such as a lack of training for teachers, the lack of an examination prescription and an otherwise occupied timetable. Harding also found that there was some reluctance from schools towards computers. According to Harding, this reluctance was based around the idea that "Many [principals] regard it [computing] as too specialised for secondary education".[82] In effect many principals were probably of a similar mind to Spence, in showing loyalty to an education system a based around broad liberal education over the skills-based (and expensive) approach advocated by Harding.

The arguments of Harding and Rose did not strongly persuade the Department of Education at the time. The Department began considering computers in the secondary curriculum at this stage but this was undertaken with any particular urgency. Writing in 1968, Spence suggests that the Department decided against including computers in the upcoming 1970 Applied Mathematics curriculum because of departmental exhaustion due to the innovations brought by 'new maths':

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[80] S. Rose (1969). Computer courses in schools. *Education and equipment services review* pp3, 5, 16.
[81] P. Harding (1969). Computers in the secondary classroom. *Education and equipment services review* pp2-3.
[82] Harding (1969).

> ...it is as though the authorities had already exhausted their capacity for innovation and now need several years breathing-space before taking any further steps.[83]

A January 1971 letter from the Department to the Auckland Mathematical Association offers some confirmation of this exhaustion. In this letter the Department note that they were then planning the introduction of computing in the 1974 6th form Applied Mathematics curriculum – three years away.

> At present the Curriculum Unit's attention is focussed on the preparation for the introduction of Computing and Numerical Analysis as an option in Scholarship and Bursary Applied Mathematics in 1974.[84]

This letter was written in response to a request by the Auckland Mathematical Association that secondary schools were provided with computers, terminals and "post-cards" at the cost of several thousand dollars a school. Its rather weak justification included that:

> The cost of having computers in schools is offset by the prime educational advantage of instant reinforcement when it comes to checking the correctness of programs.[85]

To the Department's credit, they did not seek to finance such an initiative and continued towards the adaptation of the 7th form Applied Mathematic curriculum. Their response to the Auckland Mathematical Association suggests a rather reasonable and practical way for schools to progress in introducing computing into their classroom programmes, while also revealing something of the liberal-progressive tendencies of the Department towards educational computing.

> Various methods of establishing facilities for computing in schools have been investigated and the most feasible at the present time appears to be the Portran system developed by Otago University. ... used in conjunction with Databank services it will give almost immediate national coverage...Schools that wish to introduce computer appreciation courses in the lower forms could also use this system.... Such courses giving familiarity with computer installations, their abilities, their limitations, some idea of how they work, how material must be presented

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[83] Spence (1968).
[84] Archives NZ file ABEP w4262 39/5/28 Part 1.
[85] Ibid.

> to them, simple uses in commerce and industry, and the social problems computers raise, will become more and more relevant to all pupils.[86]

The Department's tendencies towards the status quo are observed in the priority given to programming. This approach is balanced by the general emphasis placed on the possibility of younger students (lower forms) learning about the applications of technology in industry; the limitations and abilities of computers; and the 'social problems' brought by new technology. As is set out in the following section there is little to suggest that this was an approach overly influenced by the economic imperatives of the time. As the 1974 guide notes to the Applied Mathematics curriculum confirm, a general understanding of numerical analysis, flowcharts, algorithms and programming was sought rather than the development of specific skills for industry.[87]

The OECD, Education Development Conference and the first educational computing policy 1972-1979

Although it was three years in the development, New Zealand's first educational computing policy was a small step for educational computing. In 1974 a Computing and Numerical Analysis section was included as an optional component within the 7th form Applied Mathematics prescription. The number of students who sat this option was small. In considering the significant economic events, the wider political and economic context between 1972 and 1979 are arguably more important to this particular history.

The years 1972-1979 saw a range of significant economic, political, social and educational events. New Zealand's economy was challenged by oil shocks and Britain's entrance to of the European market. New Zealand joined the OECD at this time and the Education Development Conference involved thousands of New Zealanders in a discussion about schooling.

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[86] Archives NZ file ABEP w4262 39/5/28 Part 1

[87] Department of Education (1974). *7th form Applied Mathematics guide notes. Curriculum bulletin* 72 Wellington: Government Printer.

The growth of unemployment was a particularly disturbing social and economic change. Since the end of World War two, New Zealand had had a policy of full employment. In the 1970s however, unemployment started to develop in line with the country's economic concerns. In 1969 unemployment was around 0.5%, it was around 1% during the early 1970s and had reached 2% by 1979.[88] As an interesting note, it was at this time that suspicion arose about the role of new technology as a factor in this unemployment. The third Labour government (1972-1975) even placed a 40% surcharge on personal computers 'largely for fear of job erosion'.[89]

It was in 1974 that New Zealand joined the Organisation for Economic Co-operation and development (OECD). In the years from 1974-1979, the OECD seemed to have had little impact on New Zealand's overall education policy or its educational computing policy. While in more recent times the OECD has been linked with global new right entities such as the World Bank and the World Trade Organisation,[90] the OECD had yet to develop any such policy positions in the 1970s.[91] As late as 1983 the OECD endorsed New Zealand's education system by stating that it existed "with a plurality of educational purposes and aspirations".[92] The minimal influence of the OECD in educational computing policy is suggested in the Department of Education's records of the time. These records show that there were few interactions with the OECD's educational branch – CERI (Centre for Education Research and Innovation). Indeed when New Zealand were invited to a CERI conference on educational technology in 1974, they decided not to attend.[93]

In 1974 New Zealand also held the Education Development Conference. The 1974 Education Development Conference, like the Currie Report earlier, reaffirmed New Zealand's liberal educational values, despite the fact that

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[88] Briggs (2003) pp99.
[89] J. Belich (2001). Paradise reforged : a history of the New Zealanders from the 1880s to the year 2000. Auckland, New Zealand: Allen Lane, Penguin Press
[90] M. Henry, B. Lingard, F. Rizvi and S. Taylor (2002). *The OECD, globalisation, and education policy.* New York: IAU Press.
[91] Ibid.
[92] OECD (1983). Reviews of National policies for education – New Zealand. OECD pp13.
[93] Archives records ABEP w 4262 838 17/3/22/82.

instrumental and economic points of view about education were part of the policy context. The Education Development Conference was an extensive public consultation process on the education system from 1972 to 1974. The wide-ranging consultation, and the importance of 'traditional' educational themes, stand out for a 21st century audience.[94] At the 1972 priorities conference (before the nation-wide consultation rounds commenced) "three hundred delegates, representing one hundred and ten organisations... discussed such major issues as equalising educational opportunity, education and democracy, education and moral development, and education and personal development".[95] The 110 recommendations reflected the educational ideology of the time. They included concerns with early childhood enrolments, the abolition of external examinations, additional resources for teachers and improved education for Pacific Islanders and Maori(s).

In comparison with the Currie Commission however, the Education Development Conference took place in an education context that had intensified instrumental and economic thinking about education. This intensified economic approach to education at the Education Development Conference has been noted by John Codd and Anne-Marie O'Neill. Codd and O'Neill have pointed to the Nordmeyer report, for instance. The Nordmeyer report was one of many within the Education Development Conference. This report endorsed a significant role for economists in education and asked questions about the level of public investment that should be placed in education and the subsequent nature of education policy:

> ...the most significant developments in educational administration since the field was last surveyed, just over a decade ago by the Commission on Education... have resulted from the discovery of education by the economist.[96]

> ...evaluat[ing] the returns on the present investment in education, to assess alternatives which might offer better returns, to consider whether

[94] J. Ewing (1972). The Currie report: ten years later *Education* 21 (6).
[95] J. Ewing (1979). The educational development conference – an assessment five years later *Education*. 28 (10) pp3.
[96] Educational Development Conference (1974). *Working Party on Organisation and Administration Organisation and administration of education* Wellington: Government Printer pp11.

> increased demands by education on the national purse can be justified, and in general to arrive at optimal priorities in the light of limited resource.[97]

While the wider New Zealand political and educational context was showing signs of economic and instrumental input, the developments of educational computing policy were not so dramatic. The 'numerical analysis and computing' component in the 7th form Applied mathematics course provided schools with an official, and examination recognised, way of included computing in the curriculum, it also allocated them $15 per participating student. The additional funding was to help with the expenses involved with the processing of punch-card computer programming. The curriculum component itself, included mathematical (reckoning) and computing processes as algorithms, loops, flowcharts, functions, computation errors, codes, the history of hardware and software and the viewing of the National Film Library's holding of *The Incredible machine*.[98]

The number of students that took this option seemed to be small. In a survey of 72 schools, only 43 undertook the Numerical analysis and computing option, involving a total of 527 students.[99] The actual number of students doing computing across New Zealand was not kept by the Department of Education before 1980, nor was the number of computers. During the 1970s, the Department of Education kept no records of the number of computers, or the level of computer education, in schools. Departmental official at the time, Bevan Werry, has suggested that up to 100 computers were in schools by the late 1970s.[100] Most of these would not have been micro-computers, but more like the PDP 8e at Christ's.[101] A 1978 Auckland survey by Roger Woolford (1978) found that, out of 65 schools and 51 replies, only seven taught no computer studies at all, 43 schools offered computing via the Applied mathematics course and six schools offered computing at the sixth form. Third form computing

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[97] Ibid.
[98] Department of Education (1974).
[99] Werry (1981).
[100] Werry (1981).
[101] K. Ryba and B. Christiansen (1980). The microcomputer in school. *Set* (2) Item 12.

courses were found in eight of the schools and fourth form computing in 14 schools.[102]

Based on the information provided by Werry, schools in the mid to late 1970s focused on programming, although there were a small number of simulations and computers were also considered as an object of study, through such approaches as 'computer awareness'.[103] Likewise programming approaches were reinforced with Piagetian ideas about the benefits to learners of the generic thinking skills generated the process and logic of programming.[104] Any vocational urgency for programming tended to be secondary. Ramsay for instance in 1975, provides very little in the way of a rationale for the Christ's College computer, but noted that the main advantages for mathematics learning included:

(a) [That] absolute accuracy in syntax and punctuation is needed. It is a salutary experience for the hitherto untidy worker to observe the disastrous results after inserting a comma instead of a semi-colon.

(b) Logical thinking is essential and the students feel that the work improves their clarity of thought and ability to analyse a problem.

(c) They can solve problems and deal with topics which would not otherwise be considered at school, and this leads to a far more interesting and wider view of mathematics.[105]

Towards the 1980s

The Education Development Conference and the Currie Commission, understandably had very little to say about computers in classrooms. Even in 1974, the issues of equality of opportunity and education for personal development no doubt seemed much more relevant at the time than what was occurring at the back of some senior mathematics classrooms. Nevertheless the context around educational technology was growing in important ways throughout this 'first contact' period. Economic and instrumental ideas about education were also present, both in the wider context and in direct relation to the use of computers in the classroom. Although the economy came under

[102] R. Woolford (1978). Computer Studies questionnaire *New Zealand mathematics magazine* 15 4, pp196-199.
[103] Spence (1975) and Spence (1976).
[104] For example Spence (1975).
[105] A.R.D. Ramsay (1975). A computer in school. *Education* 24 (2) pp8-10.

increasing pressure, the education context maintained its liberal-progressive qualities, albeit that computer education showed that some techno-advocates could point to the direct vocational utility of computer education.

This does not mean that by the end of the 1970s, that there was general satisfaction with the educational computing policy situation in New Zealand. Teachers, such as those in the Auckland Mathematical Association, had demanded greater government commitment to educational computing at the beginning of the decade. By the end of the decade, and as the micro-computer was being developed overseas, additional pressure from parents and teachers was placed on a government that had previously offered only moderate and practical support for educational computing in schools. Going into the 1980s the microcomputer was beginning to be marketed to schools by companies such as BBC, Radioshack, Atari and Sinclair. Schools were quickly developing classroom educational computing options well in excess of what was possible when the Christ's college computer was installed 1971. The government responded to this challenge and in the early 1980s they not only put together a committee on computers in schools – they helped put together the computer.

Chapter Five

'Thinking big' - the consultative committee and the Poly computer (1980-1984)

The beginning of the 1980s was a tumultuous time in New Zealand. The Prime Minister and Minister of Finance, Robert Muldoon oversaw a poorly performing economy. Unemployment went from 2% in 1980 to nearly 6% in 1984; the public and government debts grew alarmingly; there was double figure inflation and minimal economic growth. A range of interventionist economic measures were introduced over this period to support the New Zealand economy and manage the pressures such as the oil crisis. New Zealand's initiatives at this time car-less days, wage and price freezes, import controls and export subsidies. In attempting to solve its energy problems and boost manufacturing, the Muldoon government developed a large state-led industrialisation programme in which petroleum, electricity, steel and aluminium production were to feature heavily. These projects were known as the 'Think Big' schemes.[1]

Merv Wellington was the Minister responsible for education during this period. Wellington has become known for his conservative morals and his championing of flag-raising in New Zealand schools. His time as the Minister of Education is also remembered for the conservative and hurried 1984 Curriculum Review[2] and, in keeping with the performance of the economy, cuts to education spending. In educational computing, Merv Wellington also oversaw the development of a Consultative Committee on computers in schools and the government-led efforts to design a New Zealand educational computer – the Poly. The Consultative Committee on computers in schools was a group charged with the production of a report on the developments, curricula, hardware, software and ramifications of the introduction of computers in

[1] J. Belich (2001). Paradise reforged: A history of the New Zealanders from the 1880s to the year 2000. Auckland: Allen Lane, Penguin Press.
[2] Department of Education (1984). *A Review of the core curriculum for schools*. Wellington,: Government Printer

schools. The Poly computer was to be the world's first educational micro-computer.

The Poly was designed at Wellington Polytechnic. It caught the attention of Merv Wellington during a visit made by the Minister in June 1980. Based on Department of Education papers,[3] Merv Wellington soon after initiated the government's involvement with the Poly and sought ways to commercialise the design. The Poly was seen by the Minister as an opportunity to develop a home-grown micro-computer product that could, not just meet the educational needs of New Zealand secondary schools, but also develop into a lucrative electronic export. In this sense the New Zealand educational computing scene attempted in catch up to the development in British computing at the time – the BBC, Sinclair and Atari for instance – with a specially designed educational computer.[4] The plan was for New Zealand's Poly computer to be launched into the export market on the back of domestic sales. Having accomplished considerable overseas sales, the Poly would have contributed to the new type of New Zealand economy. It was an educational equivalent to the 'Think Big' energy projects.

Most of the recommendations of the Consultative Committee, and the development of the Poly as an export success, failed to materialise. The overall failure of both these initiatives was linked to issues of the economy and the financial position of the government. The economic story is only one aspect of the events and consideration is given in this chapter to the complex mix of events and agendas that became woven into this policy dynamic. The Minister of Education and a number of Department of Education officials strongly supported the development of the Poly and were keen, at least initially, to see it progress as part of the overall approach to educational computing suggested by the Consultative Committee. Various big businesses played a part in either

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[3] An extensive number of papers were read and collected from Archives NZ for this chapter. Among the papers copied and collected from Archives NZ include a number from the ABEP w4262 series. Files of note include those within ABEP w4262 34/2/26; ABEP w4262 17/1/126; and ABEP w4262 50/12.

[4] See also N. Selwyn (2002). Learning to Love the Micro: the Discursive Construction of 'Educational Computing' in the UK, 1979-1989. *British Journal of Sociology of Education* 23 (3), pp427-443

supporting or sabotaging the Poly. In support of the Poly were the government's Development Finance Corporation (DFC) and the private software firm Progeni, who were contracted to develop much of the software. Undermining the Poly were a collection of New Zealand operated computer companies, including the United States' Apple Computers – who, fearing the establishment of the Poly in New Zealand schools – even cut the price of single computer sales to New Zealand schools by 80% at a strategic stage in the development and marketing of the Poly. This event lead to a number of schools to, by default, build their educational computing resources using the Apple platform. As a result of their actions Apple were charged and convicted of dumping.

The incident with Apple introduces something of the range of complex and 'soap-operatic' events around the Poly. To fully explore this educational computing policy episode would be the work of at least one thesis on its own. This chapter provides an overview of the policy events, first through a discussion of the key contextual developments of this period and then by considering the events and forces around the Poly and Consultative Committee. This chapter also notes a shift in the educational computing context to include the possibilities brought about by the new micro-computers. Programming was joined with more curriculum-based simulations and tutorial uses of computers. In a climate of unemployment, economic uncertainty and the conservatism of the Minister, liberal-progressive notions of educational computing were put aside as the policy context concentrated on the economics of educational computing.

The political, social and educational context 1980-1984

The early 1980s was a difficult time for New Zealand. The figure at the centre of the political difficulties of this time was Prime Minister Robert Muldoon. The Muldoon government had started its reign in 1975 and was made famous for a number of notorious incidents, including the 'dancing Cossacks' television campaign and optimistic guarantees about national superannuation. The economy, the 1981 Springbok tour and the style of leadership of Muldoon have been the traditional targets for commentators. In education there was at least the

semblance of calm with the 1983 OECD report offering a generally positive evaluation of the New Zealand education system.[5] Despite the positive OECD review the Minister of Education decided that a conservative curriculum review was required in 1983, a policy development which was somewhat inspired by America's policy processes resulting from its publication of *A Nation at Risk* (1981) The curriculum review's recommendations were never implemented and when Prime Minister Muldoon announced the snap election for July 1984, the National party were well on the way to completing their three terms in power. At the end of the Muldoon era there existed little in the way of positive policy developments either in educational computing, or indeed, in educational policy overall.

The economic background

Between 1960 and 1980 New Zealand's economic position witnessed a dramatic decline compared to the other OECD countries.[6] From a position of fifth in the world for GNP per capita in 1960, New Zealand was twentieth in 1980. Economic growth averaged around four percent in the early 1960s and by the early 1980s it was virtually non-existent.[7] Unemployment went from 0 to 2% of the workforce in 1980 and 6% by 1984. The healthy surpluses became deficits and New Zealand accumulated substantial public and private overseas debt. The oil shocks and Britain joining the EEC were major factors in this economic drop but at least part of the reason is thought to have been of the economic policies of Robert Muldoon. The Treasury certainly thought so in its brief to the 1984 Labour Government.[8] They suggested that the previous economic policies involved 'a heavy reliance on particular forms of intervention in the economy [that did] not achieve their objectives and frustrated the achievement of higher living standards'.[9]

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[5] Organisation for Economic Co-operation and Development (OECD) (1983). *New Zealand Reviews of national policies for education*. Paris: OECD

[6] S. Stratford (2002). *The dirty decade: New Zealand in the 80s.* Auckland:Tandem Press.

[7] D. McLoughlin (1992). The undeveloping nation: New Zealand's twenty-year fall towards the third world. Auckland: Penguin Books

[8] New Zealand Treasury (1984). *Economic Management* Wellington: Government Printer

[9] As cited in S. Stratford (2002). *The dirty decade: New Zealand in the 80s.* Auckland: Tandem Press, pp12

A close assessment of Robert Muldoon's government and economic polices is not attempted here. Such an assessment is beyond the scope of this work, however, though it is relevant to consider the overall economic situation, including certain policies of the Muldoon government, and how they have contributed to educational computing policy.

The large-scale solutions to New Zealand's economic situation through the Think Big schemes are an important aspect of the policy context of this time. The Think Big policy, in a sense, provided a model for the development of the Poly. The industrial energy schemes around petroleum and electricity represented a way for New Zealand to escape from the perils of the international oil market and develop some energy self-sufficiency. The scale and technology involved in the Think Big projects also represented New Zealand's efforts to 'diversify' its industrial base. Instead of an economy based so rigidly around being 'Britain's farm', the New Zealand economy was to be one also based on manufacturing and industry.

New Zealand's social context 1980-1984

There were a number of very important social issues that made up the context around the early 1980s in New Zealand. The 1981 Springbok tour fragmented New Zealand society and polarised opinion on the government and sporting links with South Africa.[10] The poorly performing New Zealand economy affected the social context through the increasing unemployment and its associated social problems.

Some of the concerns around unemployment were connected with new technology. The government, employers, social commentators and unions developed their various points of view on this issue. These points of view included genuine concern about the future of employment and a recognition that new technology offered ways to potentially improve the economic situation of New Zealand.

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[10] Belich (2001).

New technology had led to questions about its potential pitfalls before the early 1980s. However the publication of Professor James Duncan's paper 'Redeployment of the workforce consequent on the introduction of microprocessors'[11] concentrated public interest in technology and the workplace. As a member of the Commission for the Future, Duncan's estimate that between 337,00 and 595,000 people would be displaced by micro-computers over the next 30 years caused considerable public concern.[12]

Other commentators also made links between employment, the future and technology. Pauline Ray (1979) writing in the *Listener* noted that:

> Unemployment is one of the biggest problems facing the Western world at present. With the aid of technology it promises to reach disastrous proportions in the next 10 years.... Treasury predictions show that even under the most favourable conditions this will reach 280,000 by 1985. If the impact of technology is taken into account unemployment could range from 340,000 (23.3 per cent of the workforce) to 460,000 (31.5 per cent) by 1985.[13]

Ray's point of view also left little room for optimism:

> Fred Turnovsky, president of the New Zealand Manufacturer's Federation, says that even if the country doubled the volume of its manufacturing and processing of exports within five years this would create only 6000 jobs a year.

Government Ministers were more sanguine in their approach to new technologies and the economy. The Minister of Labour at the time, Jim Bolger, in an address to a seminar on new technology, was keen for New Zealand to see the potential of new technology for a new economy:

> employment levels could be maintained or increased in the long term only by the growth of efficient sectors in the economy. This could be frustrated by employers' lack of enterprise or uncooperative employees fearing the adverse effects of new technology.[14]

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[11] J. Duncan (1979). *Redeployment of the workforce consequent on the introduction of microprocessors* Report 20, Chemistry department, Victoria University of Wellington August 1979.

[12] For example D. Wallace (1981). Technological change – its effect on employment *New Zealand Engineering* March 1; C. O'Leary (1980). Machine takeover. *NZ Listener* May 31, 1981.

[13] P. Ray (1979). The second industrial revolution. *NZ Listener* August 18, 1979.

[14] Wallace (1981).

The State Service Commissioner, M.C. Probine speaking in December 1979, also made a link between training, technology and economy, including a point about British educational policy:

> Some jobs will diminish, and some will disappear, and it is therefore important that we should have an enlightened programme of training and reprogramming for those that are displaced. ...
>
> ...Communication technology could play a powerful role in education (its seems a waste to use a powerful medium like television for entertainment purposes only when it could be used for education as it is in Britain).[15]

Regardless of these government points of view, a fearful point of view certainly existed in the background to discussions about New Zealand's future. This background included the discussion of technology and what it could mean for the economy and unemployment. As Fred Turnovsky has suggested:

> If New Zealand did not accept the influx of new technology, it would have a peasant economy for the rest of its days.[16]

The fear of the peasant or third world economy is difficult to dismiss in an economy that had dramatically worsened in the preceding decade. It was this fear, and the potential for export opportunity, that is especially relevant to the educational policy context of the early 1980s. As these glimpses suggest, unless some form of drastic again was taken, and even in spite of such action, New Zealand's economy was set to continue its course away from the developed nations. In a real sense New Zealand was a country that did face an uncertain future.

The educational context

There were a number of relatively minor educational developments in education policy in the early 1980s. Issues of teacher supply to schools and teacher ratio were on the agenda as was the costly integration of private schools.[17] The major educational event of the early 1980s involved the 1983 publication of the

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[15] M.C. Probine (1979). The electronics revolution and its possible impact on employment and development. *NZ Engineering* 34 December 1979

[16] Turnovsky as cited in Wallace (1981)

[17] S. Butterworth (1993). *The department of education 1877-1989.* Wellington: Ministry of Education

Organisation of Economic Co-operation and Development (OECD) report on New Zealand's educational system; the need for the government to trim 3% off government expenditure;[18] and the 1984 publication of the review of the Core Curriculum.[19]

From one point of view the 1983 report by the OECD should have calmed some fears that the education system may not be prepared for the economic situation that faced New Zealand. The OECD review of education policy found that New Zealand's education system was is generally in good stead "with a plurality of educational purposes and aspirations",[20] and moreover, where...

> Education is not seen as an activity above, or uninfluenced by politics, but as requiring to be pursued in accordance with more or less intrinsic purpose, having to do with the growth and development of individuals, rather than as an instrument for the attainment of political or social goals.[21]

Such comments imply that New Zealand's educational system was working well and, with its links to personal development, also adhering to the framework established by Fraser in 1939. Despite the general endorsement of this approach, the OECD report did contain some links to economic concerns.[22] As Butterworth and Butterworth (1998) note, these economic links are expressed on page 49 of the report, with the "...warning that education must arm itself to meet economic changes which were not cyclical, as in previous recessions, but structural and permanent".[23] In this sense the OECD report continues the trend developed by the Currie Commission (1960) and Education Development Conference (1974) in drawing attention to economic issues and education.

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[18] M. Wellington (1985). *New Zealand education in crisis.* Auckland: Endeavour Press, pp39.
[19] Department of Education (1984).
[20] OECD (1983) pp.13.
[21] OECD (1983) pp22.
[22] Observe the degree to which economic issues have become more important in the following document: OECD (1985). *Education in a modern society.* Paris, France: OECD.
[23] G.V. Butterworth and S. Butterworth (1998). *Reforming education: the New Zealand experience, 1984-1996.* Palmerston North: Dunmore Press.

The OECD report should also be considered in relation to the United States' publication: *A Nation at Risk.*[24] Merv Wellington notes, how this publication, detailing the alleged demise of education in the United States, influenced his own thinking of the time.

> The concern about educational standards is not a New Zealand phenomena...*A Nation at Risk*, concluded, in part "if an unfriendly foreign power had attempted to impose on America the mediocre educational performance that exists today, we might well have viewed it as an act of war'. ...
>
> A significant number of New Zealanders believe that similar comments could equally apply to New Zealand education. I found employers, and many parents, either bewildered or exasperated by what they saw as a shortage of capable skills among young job seekers.[25]

The conservative rationales within *A Nation At Risk* specifically influenced Wellington's decision to go ahead with the review of the Core Curriculum for schools. The final publication from this review prescribed the hours of maths and language teaching that should be undertaken. This teaching was to concentrate on the 'basics' of these subjects and help address the supposed skill shortage in New Zealand's students.

There was an important point of difference worth noting between Wellington's review and *A Nation At Risk.* Following on from the failure of the Poly project there is very little mention in either *A review of the core curriculum for schools,* or in Wellington's autobiography,[26] of the role of educational computing in the core curriculum. This is interesting because computing makes up such an important aspect of *A Nation at Risk.* It is almost as if the experience with the Poly left Wellington with very little ambition for educational computing.

Educational computing in the early 1980s

From the start of the 1980s educational computing started to accelerate in New Zealand schools. The advent of the micro-computer allowed schools to purchase

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[24] National Commission on Excellence in Education (U.S.) (1981). *A nation at risk: the imperative for educational reform: a report to the Nation and the Secretary of Education.* Washington D.C.: United States Department of Education.
[25] Wellington (1985) pp58.
[26] Wellington (1985).

relatively inexpensive Apple, Sinclair and Commodore computers,[27] which could not only be programmed but also allowed for the running of commercial programmes such as simple simulations, curriculum-based software and word-processing. Despite the fact that Seymour Papert published *Mindstorms* in 1980, programming lost ground as the dominant form of educational computing with the increasing use of the micro-computer as both a 'tool' (e.g. for simulations and word-processing) and as a 'tutor' (e.g. drill and practice exercises).[28] Computer awareness, including the social implications of technology as well as the consideration of the computer as an object of study, continued to develop at this time too.

The development of the micro-computer and the increasing diversity of computer applications available to schools, meant that primary schools began to develop their educational computing at this time. Up until the early 1980s educational computing in New Zealand was mostly concerned with programming and educational computing at secondary schools. With micro-technologies however, primary schools had affordable computers that could be used for tasks beyond programming such as simple simulations and games. The department itself started to observe the changes, although the official policy throughout this time was to neither encourage or discourage primary schools into computers. [29]

From the early 1980s the Department of Education also started to keep track of the numbers and usage of secondary school computers. Although not all schools returned the Department's survey, information the Department estimated that by the start of 1984, 97% to 98% of secondary schools had one or more micro-computer.[30] The total number of computers by the end of 1983 was well over 1600 and, as can be seen on the table below, this represented a large increase since 1981.

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[27] Relatively inexpensive compared to the $8,000 Christ's College paid in 1971 (Introduction, this volume).
[28] K. Ryba and B. Christiansen (1980). The microcomputer in school. *Set* (2) Item 12.
[29] Briefing paper 1696 to the Minister of Education 28 September 1984 ABEP w4262 34/2/26/1.
[30] Briefing paper 1538 to the Minister of Education Undated (late 1983/4?). ABEP w4262 34/2/26/10.

Table 1: Total computers in secondary schools (1981-1983)[31]

	May 1981	July 1982	October 1983
Number of secondary schools with micro-computers	141 (36%)	245 (63%)	376 (96%)
Number of machines in schools[32]	229	554	1,683

The types of computers in secondary schools varied considerably. Microsoft and IBM had yet to register their dominance on the global personal computer market and so this variety of micro-computer also made for variety of software systems. This variation in software was often discussed in the policy context and the potential proliferation of the Poly was cited as an opportunity for New Zealand schools to rationalise their educational software and use the same operating systems across all schools[33]. The Department's failure to rationalise New Zealand's educational computing platforms is evident in a 1983 Department of Education survey showing the breakdown of the different computers in use in schools in the early 1980s.[34]

Table 2 Types of computers in New Zealand secondary schools (1982-1983)[35]

	Number of machines		**Number of secondary schools**	
	July 1982	Oct 1983	July 1982	Oct 1983
Apple	189	881[36]	107	315
BBC	-	121	4	18
BMC	-	53	-	4
Poly	58	79	9	15
TRS-80	182	206	83	82
Commodore	62	142	24	28
Franklin Ace	-	73	-	17
Microbee	-	37	-	6
OSI	21	35	10	17
Pegasus	14	14	7	6
Other	26	42	19	21
Small machines[37]	159	312		

[31] Briefing paper 1538 to the Minister of Education Undated (late 1983/4?). ABEP w4262 34/2/26/10.

[32] These numbers did not include 'small computers' such as the Sinclair ZX81 or Sharp PC1211.

[33] Operating systems are the base software systems that allow other forms of software to be used.

[34] See also C.S.F. Yip (1985). *The use of computers in New Zealand Schools.* Thesis presented at Victoria University of Wellington in partial fulfilment of the requirements for the degree of M.A. in education. Wellington: Victoria University.

[35] Briefing paper 1538 to the Minister of Education Undated (late 1983/4?). ABEP w4262 34/2/26/10.

[36] Note the jump in Apple computers from 1982 to 1983. This jump is explained in the section below which discusses the events surrounding the Poly computer.

[37] For example Sinclair ZX81, Sharp PC1211.

Total	**713**	**1995**	**261**	**378**

The early 1980s also saw the Department's first attempt to categorise the curriculum uses of computers in schools. Again, the marked increase in the use of computers across the curriculum from 1981 to 1983 is evident in the Department's figures. Based on the 1981 figures the Consultative Committee on computers in schools reported that "relatively little computer activity was reported" in subjects other than mathematics and new computer courses. By 1983 results from a survey by C.S.F. Yip showed considerable educational interest in computer use across the curriculum. Mathematics and programming were still strong, but other curriculum areas were also well represented.

Table 3: The use of computers in New Zealand schools 1983

Subject	Number of schools
Computer Awareness	251 (94% at Form 3/4)
Computer studies	157 (88% at Form 6)
Applied mathematics	258
Mathematics	158 (74% at Form 3/4)
Physics	162
Keyboarding/typing	121 (53% at Form 3/4)
Economic studies	117 (36% at Form 3/4)
Geography	88
Chemistry	82
Accounting	69
Biology	60
Science	46
Foreign languages	40
Music	26
English	23
Special needs classes	48
Evening classes	87
Other, including clubs	23

Part of the reason for other subjects registering in Yip's survey is most likely because of an increase in both 'tool' and 'tutor' uses of computers in schools.[38] Computer Assisted Instruction, or the use of computer as a tutor, is implied in Yip's results where respondents rated 'individualised instruction' as the greatest advantage of computers in the classroom, closely followed by 'immediate feedback' and 'motivation'.

Table 4: The uses of computers in New Zealand schools

Factors[39]	No. of schools
Provide individualised teaching	14
Immediate feedback	13
Motivation	12
Simulation	11
Learn at one's own pace	11
Interactive response	10
Student's interest	10
Patience	9
Novelty	9
Visual impact	8
Gives practice (drills)	6
Hands-on experience	6

These results also reflect CAL (Computer Assisted learning) or computer as 'tool' uses too. This would be in the form of simulations and word-processing type uses. Because of the way Yip's results are presented however, it is not clear the extent to which either CAI or CAL were undertaken in New Zealand schools in 1984. The Department of Education did not survey for the extent of CAI and CAL either.

By 1983 Form Six Computer Studies was also a popular course. Form Six Computer Studies had been developed after a group of Auckland teachers met with Departmental officials in 1979. The course drew mainly upon a liberal-

[38] This could include electronic equivalents of Cloze exercises and other such behavioural activities for learning.

[39] These are the top 12 factors as identified by Yip (1984/1985). The question asked of teachers was 'What do you see as the computer's greatest advantages in this type of teaching? There were 220 questionnaires sent out with 183 returned.

progressive approach to education, alongside an occasional instrumental rhetoric. The course was described as both "non-vocational" and "practical" in its introduction. The objectives for the course mirrored this combination and exhibited a preference for programming. The course included sections on the social issues surrounding computers, the history of the computer and how computers could be applied in the world. The objectives of the course were to:

1. Understand the concepts of computer programming and data handling, and develop competence in a specific language implementation.
2. Develop an appreciation of task definition and problem solving as precursors to programming.
3. Develop an awareness of the different components and functions of typical computer systems (including both hardware and software).
4. Gain a knowledge of applications in broad areas, such as business, engineering and science, and the humanities.
5. Gain a knowledge of the history and development of computer technology.
6. Develop an understanding of the social influence of the computer in the contexts of security, privacy, ethics and automation.[40]

From 1982 to 1983 the number of students participating in Form Six computer studies rose from 5495 to 12717. That said, the Department did not support computing as a bursary option at schools. The rationale behind this was that such an option would potentially absorb the computing resources of secondary schools and reduce the computers that were available for other subjects.[41]

The Consultative Committee on computers in schools

The Consultative Committee on computers in schools set up late in 1980 and first met in February 1981. According to Departmental records, the committee was established in line with the Minister's interest in the Poly computer. The Consultative Committee representatives were a mixture of advocates for educational computing. There were five departmental officers, including those

[40] Department of Education (1983). *Form 6 computer studies.* Wellington: Department of Education.
[41] B. Werry (1987). Computer studies in the seventh form – a departmental view. *Computers in Education* (1) 2.

who were closely connected with the development of the Poly. There was a large contingent of education sector representatives, including three from the teacher unions, a Principal and three representatives from various education boards. Additionally the NZ Vocational Training Council, NZ Computer Society, NZ Employers Federation, and the NZ Federation of Labour were also represented. There were no representatives from the computer industry.[42] The Terms of Reference of the Consultative Committee were:

1. To review developments relating to computers in schools in New Zealand to date, in light of overseas developments.[43]
2. To consider the syllabuses which might be involved in computer activities and to plan a subject-class level grid of possible programmes.
3. To consider the effect of such programmes on school subjects and school organisation.
4. To be involved in the evaluation of hardware and software.
5. To make recommendations to the Minister and to the Director-General of Education with relation to the syllabuses and the use of computers in schools.

The committee was to provide a final report to the Minister in February 1982 as well as a preliminary report, before the November 1981 election. The final report contained 16 recommendations essentially presenting the need for a comprehensive educational computing policy in New Zealand. The recommendations covered teacher training, a computer awareness course at the junior secondary school level and computer studies at the senior secondary level; the urgent requirement to standardise platforms (or computer languages) to ease the development of national computer programmes; the setting up a Departmental Courseware (educational software) unit to produce, evaluate and distribute software to schools; and the need for the government to provide a "major financial commitment... to support the introduction and ... continued

[42] In part this may have helped avoid a conflict of interest in relation to the terms of reference related to the evaluation of hardware and software. The Poly, through the Departmental officers, had a type of representation however. It is also worth noting that the absence of computer-based companies is in contrast to the position in later years, where computer-based companies are heavily involved. See chapters Seven, Eight and Nine of this volume.

[43] This was especially in relation to developments in the British educational computing context. See for instance N. Selwyn (2002) and New Zealand Herald *Computer lag in NZ schools* as cited in ABEP w4262 34/2/26/10.

operation of a total programme of computer education and the use of computers in schools."[44]

The report from the Consultative Committee did not draw upon liberal-progressive notions of education, to the same extent as the education and policy contexts of the 1960s and 1970s. The Consultative Committee had an eclectic mix of liberal and vocational elements within its report. For instance, it made reference to both the general educational benefits of computers in schools, while emphasising the importance of technological skills in an uncertain economic future.

> The Committee believes the development of computer courses and the use of computers in schools is essential to fulfil the general educational aim of equipping students with the knowledge, skills and attitudes to enable them to enjoy their rightful place in society... Computers are becoming an unavoidable feature of daily life for almost every citizen.
>
> In addition it is important for the country's general economic future that students with special aptitude for work with computers are identified early...

Many of the participants were already involved in educational computing and the representatives were enthusiastic about the potential benefits to education. As a result, the committee's report highlighted the potential of educational computing and made optimistic assumptions about the benefits computers.

> The computer also has the potential to improve the quality of education in schools by assisting the processes of learning and teaching.[45]

Most of the recommendations of the report were not implemented. As is discussed in the following section, the development of the Poly, and a comprehensive educational computing policy, stalled on a lack of funds from the government amongst a context of unfortunate political and entrepreneurial activity.

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[44] Department of Education (1982). *Report of the consultative committee on computers in schools* Wellington: Department of Education pp8-9.
[45] Department of Education (1982). pp11.

The Poly computer

In hindsight, project POLYWOG was an ambitious project. The eventual failure of the Poly has many of the elements of a television drama. The Poly story contains accusations of bureaucratic pecuniary advantage, big business dirty-tricks, successful prosecutions for uncompetitive behaviour, the involvement of the Ombudsman and the promise of big returns – not to mention the government's Development Finance Corporation (which became ingloriously bankrupt in the early 1990s).[46] Overall, the Poly's story involves a number of important events and reveals a range of educational forces at work. A critical understanding of the Poly's story requires a careful and critical reading of these different aspects.

A popular summary of the events has characterised the Poly as an innovative and bold attempt to develop micro-computing capability skills for New Zealand's secondary students.[47] The government, however, lost its nerve to the detriment of New Zealand's students. From the outset, the Minister of Education, Merv Wellington, was one of the major proponents of the Poly and schools believed that the Department of Education was on the way to resolving the lack of computers in New Zealand secondary schools. Government inaction and the aggressive marketing of computer companies prevented the Poly becoming a computing platform for New Zealand school – much to the disappointment of parents and schools.

> The Dunstan High School Board of Governors is becoming increasingly distressed at the Government's inaction on the matter of computers in secondary schools.
>
> The school is creating a bank of computers and does not know the best way to achieve this when a long-awaited statement from the Minister on the possible issue of the Poly computers to schools is made.[48]

One of the obstacles to the Poly's proliferation into New Zealand schools was an evaluation of the Poly by the State Services Commission (SSC). This

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[46] This information is based on Department of Education files from Archives NZ.

[47] For example Close Up, (1982). *Chopped Chips*. TVNZ Documentary.

[48] Example of several letters found in Archives NZ files. This letter sourced from ABEP w4262 17/1/26/5 dated December 1981 from T.B. Brooks secretary Dunstan High School Board of Governors.

evaluation sought to compare the Poly with other educational computers. The best computer was to be recommended to schools. Given that the Poly was specifically designed for the educational market, and that it had had the support of the Minister, schools expected that the Poly would be favoured in the evaluation and that the government would purchase a bulk order of Poly computers, from which schools would receive a substantial reduction in the price. This reduction in the price of hardware was nicely complemented by the advantages of having a uniform software platform for the development of educational software across the country.

Unfortunately for schools, the State Service Commission evaluation backed not one, but five computers – although one of these was the Poly. Somewhat unexpectedly for schools and parents no money was forthcoming from the government to help with the purchase of any of these computers. Schools were essentially left to sort out for themselves the place of computers in the curricula, and the issues of financial and technical support.

This version of events covers many of the main points of the Poly story – although it is a rather simple version of the motivations and events at the time. Omitted from this summary is a critical discussion of how the economic and/or export potential of the Poly dominated the bureaucratic, political and business thinking to the detriment of educational considerations. Indeed the educational considerations concerning the Poly were simplistic. As the economic potential of the Poly was asserted by those connected with the manufacture and potential development of the Poly, the educational benefits were readily assumed.

Also omitted is the fact that the enthusiasm of the Minister of Education, Merv Wellington, and the Department of Education was partially based on the economic potential of the Poly. This admiration was in evidence from July 1980 when the Minister and the Director General Bill Renwick visited the Wellington Polytechnic computer science department and observed the development of the original Poly.[49] Enthusiastic about by the fact that the computer was specifically

[49] Briefing paper 1696 to the Minister of Education 28 September 1984 ABEP w4262 34/2/26/1.

intended for the classroom, the Minister asked his officials to prepare a paper outlining the position of computers in schools and setting in motion the development of the Poly.[50]

According to a Department of Education official "the main feature of this paper was to fund the research and development required to bring the POLYWOG to the pre-production stage".[51] Seven individuals made up the group who developed the ideas in the report. They included two departmental officials, three teachers, Chris Potter from the NZ Computer society and Stuart Rose from IBM.[52] One of the departmental officials was Bevan Werry, who worked in the mathematics development division. Overall it was not a group who engaged in a sceptical questioning of the role of computers in schools. It was a group interested in 'how' rather than the 'why' or 'why not' of educational computing. This group worked from an assumption regarding the educational necessity, both here and overseas, for computers in the classroom. The educational contexts posited by their paper included:

I. The introduction of computer awareness courses for all pupils at junior high schools level (Form 4);
II. The introduction of a computer studies course at senior high schools level (Form 6);
III. The encouragement of the use of computer techniques in the teaching of all subjects.

Following on from these educational rationales, this paper devotes much more consideration of the issues connected with computer 'author languages', the research, and experimentation required for the Poly, as well as the export potential of the Poly and the possible revenue generated for Department of Education by the Poly patents, licences and software. The most notable financially-based statement in this paper said:

> It would appear that both the hardware and software being developed at Wellington Polytechnic has export potential, especially for countries bordering the Pacific.

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[50] Briefing paper 9200 to the Minister of Education 11 July 1980 ABEP w4262 39/5/28/3.
[51] ABEP w 4262 764/17/1/126 Letter from Kevin Hearle to ADG Ross, 29 August 1980.
[52] See discussion of Stuart Rose from *Chapter Four* of this thesis.

The questions begged by this paper include 'how qualified is the Department of Education is to assess the export potential of new technology?', 'why would the export potential of a computer be of concern to the Minister of Education?'. These questions underline the idea that from the beginning of this project the commercial potential of the Poly was a key driver of the actions of the cash-strapped government. As the following Departmental summary of events sets out:

> In July 1980 the Minister of education, the Hon M L Wellington visited Wellington Polytechnic and viewed a prototype of a microcomputer system developed by that institution. the Minister recognised the potential of this piece of technology and asked his department to pursue the possible commercialisation of the technology. The Department of Education being a non-trading organisation contacted the Development Finance Corporation, Applied Technology Programme to assist us in taking the project through research, development and evaluation to a final concept for commercialisation.[53]

Certainly the involvement of the Development Finance Corporation (DFC) underlined the economic justifications for the Poly. In the 1980s the DFC operated as a government catalyst agency for private sector developments in New Zealand. In working with the Department of Education officials, the DFC understood that the Poly project was most likely on a pathway that would see their purchase, by the Department, on behalf of every secondary school in New Zealand.[54] By August 15th 1980, the DFC, having had several meetings with the Polytech and Department of Education officials, produced a report on the management of the 'POLYWOG' project. This report recommended the go-ahead of the project and justified the decision with an estimate that the "total potential sales in New Zealand is thus approximately $7-8 million".[55]

By early 1981 the DFC engaged the private sector company Progeni to enter the project and to help form the Polycorp, the private sector software company that was responsible as the Poly made its way towards commercialisation. On 23rd May Polycorp lobbied Members of Parliament with a presentation outlining the

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[53] Quoted from an undated departmental paper (approximately July 1981). ABEP w4262 17/1/26/5.
[54] Close up (1982).
[55] Development Finance Corporation (1980). Unnamed confidential report. 15 August 1980, pp5, as sourced from ABEP w4262 17/1/126.

project including the educational and economic justifications for the Poly. The economic justifications in this report were arguably better prepared than the educational assumptions. The economic potential of the Poly included a summary of the internal market that awaited the Poly:

- 4000 computers in secondary schools
- 2500 computers in primary schools
- 2500 in job training schemes

and in terms of the export potential Polycorp suggested;

> It is Polycorp's view that a viable and potentially most rewarding overseas market potential exists – one that can confidently be seen to be many times the magnitude of the original New Zealand base. ...
>
> As a guide to this potential, authoritative sources in the United States have estimated that, by the year 1985, the total world market for microcomputers will represent 9 billion dollars per annum in turnover.[56]

It was this excitement, rather than a well considered or visionary understanding of the application of computers in education, which helped propel the Poly towards the Cabinet table. For instance, Polycorp's educational justifications for the Poly were used to support the economic benefits of the Poly. The educational justifications did not draw themselves from any liberal-progressive notions of education, but rather a commercial form of common sense:

> Commonsense suggests that micro-computer learning systems should fulfil two major roles in New Zealand schools....
>
> A. To help students adapt to an increasingly computer-oriented workplace.
>
> B. To offer a teacher-support tool, providing additional motivational force for the learning process across a broad range of subject material.

A trial of Poly computers was undertaken in mid 1981. The prototype machines were tested at Queen Elizabeth College Palmerston North and Tawa College Wellington, over six weeks in June to mid-July 1981. The software used included material on:

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[56] Polycorp's presentation to Cabinet Tuesday 23 May, 1981 as sourced from ABEP w4262 17/1/126 Part 2 pp9.

- Physics (projectiles for form 6)
- Geography (climatic conditions for the Canterbury plains for form 6)
- Keyboard skills (forms 4-6)
- Computer awareness (form 4)
- English as a second language
- Farming (TCB farm management)

The evaluation of the Poly prototype was led by Ray Adams from Massey University. Adams was well known to the Department and was also known to have positive views towards educational computing. The evaluation examined:

- the operational effectiveness and efficiency
- educational effectiveness and efficiency
- administrative effectiveness and efficiency.[57]

The evaluation had a short time frame and did not make any strongly positive or negative findings about the Poly. It did not make any direct comparisons between the Poly and other computer systems, however it did state that "the hardware is at least as good as any commercially available microcomputer". The evaluation found that it was difficult to claim any great educational effectiveness over the six weeks of the evaluation. Statistically significant gains were registered in geography and students using computers were not disadvantaged "against classes taught the same material in a traditional manner".[58] Overall though, while there was no triumphant endorsement of educational computing in this short evaluation, there was also nothing to hold up the progress of the Poly and the Department continued its developmental process.

By the end of 1981 Merv Wellington also received a preliminary report from the Consultative Committee on computers in schools with an extensive list of recommendations outlining the need for an extensive government policy for

[57] Draft departmental briefing on the Massey University evaluation report ABEP w4262 NS 50/2 com-pc.
[58] Ibid.

computers in schools.[59] At this point the Department drafted a comprehensive Cabinet policy proposal for computers in schools. This proposal was not yet ready to endorse the Poly prototype but it did set out what educational computing was to look like in the future:

> It is proposed to introduce Computer Awareness, Computer Studies courses and encourage the use of the computer as a teaching aid in secondary schools in New Zealand. The programmes would be supported by a low cost, Micro-Computer system.
>
> The objective is to equip secondary school students to face a world in which computers and associated technology will form an unavoidable part of every person's daily experience. These programmes together with those already running at 7th form level [e.g. applied maths] will better equip students for their working life or study at the tertiary level.[60]

This wording in this part of the policy proposal helps to demonstrate an important aspect of computers in education. It is not a straight-forward process to justify computers in terms of a broad humanitarian approach to education. Computers, by their nature, lead more easily into issues of work and the future, than they do civic responsibility and human development. Of course in a situation where educational solutions are becoming increasingly seen as economic solutions, then it is easier to justify such a policy proposal as this one in terms of the future "working lives".

Certainly the education justifications in Wellington's policy proposal are not built upon deep philosophical understandings of what it might mean to be educated. Computers were said to have become "a necessary and integral part of the curriculum", and as was stated in the policy proposal:

> Currently the education service is under some criticism for not providing general and specific education in the "computer" field.
>
> The new technology will affect everybody in their workplace, the home, and their leisure pursuits. the impact of technology on society will accelerate throughout the 80s. Those people who are adequately prepared should be able to cope with the technology and the change it will bring.[61]

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[59] The Consultative Committee contained three officials actively supporting the Poly development with the Minister.
[60] Departmental policy proposal (1981/82). ABEP w4262 17/1/126.
[61] Ibid.

These comments are heavily based on an economic framework for educational computing. Unlike the 1960s and 1970s there is very little reference to educational computing occurring within an education system based on the development of citizens and an improved democracy.

Following the submission of this proposal to the Cabinet Officials committee P. W. Boag, the deputy Chairman of the State Services Commission wrote the Minister a letter encouraging a tender process for a "low-cost micro-computer". The criteria for this process would be defined by the Department of Education and the Computer Services Division of the SSC.[62] In many ways this letter reaffirmed what might be thought of as 'good government' when it came to dealing with matters of multi-million dollar tenders. It also ensured that there would be an official process for the Poly to undertake before becoming officially supported by the government.

A State Service Commission-based evaluation and tender process provided a balance to the manner in which the Department and Minister had hitherto endorsed the Poly. Schools had already been sent advertising by the Poly and messages by both the Department and Minister had implied that the government was going to select the Poly as its educational computing platform. This may have been some form of electioneering building up to the November election, but throughout 1981 this state of affairs led to some confusion and angst from schools. Observe this letter from the Headmaster of St Paul's Collegiate in May 1981:

> I am in a state of confusion about the whole question of computer hardware for schools and I would imagine that there are others in the same state.
>
> ...Given the facts as they are presented in the [recent Polywog] circular and the Departmental advice which I have received verbally, we have decided to wait until 'Polywog' produces its processor before embarking on any major expenditure.[63]

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[62] SSC Deputy Chair P W Boag letter to Merv Wellington, Minister of Education 23 Oct 1981 ABEP w4262 17/1/126 5a.

[63] Lawrence, M.G. Headmaster St. Paul's Collegiate letter to Merv Wellington, Minister of Education 4 May 1981 ABEP w4262 34/2/26/3.

The *PPTA news* in August 1981, provides an example of the sorts of statements received by schools which could have led to them imagining, prior to the State Service Commission involvement, that the Poly had the inside running:

> Mr Wellington says it is intended that the Poly system will become the standard in New Zealand secondary schools – but he does say that the 130 schools who have already bought equipment will not be penalised.[64]

In response to the public perception that the Poly was destined for a large government contract, public computer companies became busy with their own forms of marketing. One such case was the development of what Peter Isaac called an "ingenious" deal with Auckland's Birkdale College.[65] Under this scheme Birkdale college acted as the agent for Radio Shack computers lumping together orders from schools across New Zealand and thus creating a better deal for their client schools.

Other computer companies took a direct political route and there were several delegations of computer industry people who approached the Minister regarding the future of educational computing. Microprocessor Developments Ltd was a particularly energetic advocate, in particular John M. Lovelock who was also the Chairman of an industry group calling itself the 'Poly' sub-committee of the Microcomputer Industry Association (MIA). In a 16 October 1981 letter to the Manager of the DFC (and copied to the Minister of Education) Lovelock set out the objectives of the sub-committee and made a number of points about the development of the Poly.

> To convince the Government that the purchasing of microcomputer systems for schools should be by public tender.
>
> To record our concern at the sequence of events that has occurred leading up to the formation of Polycorp.

Lovelock questioned the role of the DFC and the exclusion of New Zealand companies from the development of Poly hardware. He also suggested that the

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[64] *PPTA news* (2).12 August 1981 pp1.
[65] P. Isaac (1982). *Computing in New Zealand.* INL Print, pp58.

material schools had received about the Poly was misleading and unfairly advantaged the Poly.[66]

Lovelock intensified his arguments two months later in a letter to Assistant Director-General of Education J A Ross. In this letter Lovelock criticised Polycorp's presentation of reports to schools on roneo paper "so that they appear to look like an official release from the Department". He also criticised the use of Departmental staff to present the features of the Poly computer at commercial seminars. Lovelock suggested that the involvement of Departmental officers in such matters could in some way reflect a pecuniary involvement from these officers and a contradiction of their role as public servants.[67]

The New Zealand representatives of Apple Computers also developed a strategy against the Poly computer. In July-August 1982 Apple Computers made a New Zealand only special deal of approximately 80% off the cost of a single computer to secondary schools. It was an extraordinary deal and had the effect of propelling schools down a particular platform at the stage when the government had not yet finished its processes to recommend a particular computer. Apple's 'generous' offer was ruled to be illegal and they were fined by the Commerce Commission. Following on from this Apple managed to get around the issue by offering 'free software' with future hardware purchases which amounted to a similar sort of deal.

After the election victory by National in November 1981, Merv Wellington was returned as the Minister of Education and continued to develop the Poly project. Although Wellington had Cabinet's conditional support, the expenditure committee did not provide the funding the Minister required. The economic position was such that, in a time when there were expenditure cuts to Vote: Education, the Poly project, which could have cost $29 million over 5 years,

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[66] John M. Lovelock letter to the Manager of the Development Finance Corporation October 16 1981 as sourced from ABEP w4262 17/1/126/ Part 5a.

[67] John M. Lovelock letter to Assistant Director-General of Education December 16 1981 as sourced from ABEP w4262 17/1/126/ Part 5.

was not considered favourably.[68] A tender process still commenced, and by the start of June 1982 the criteria for identifying a computer schools might choose was in place, even if the money was not likely to be forthcoming. Companies were asked to have their machines available and the State Service Commission evaluation occurred in early August.

Schools expected that this evaluation would be a step towards government coordination and policy support for educational computing. This did not occur and instead of the Poly being identified and funded by government, five computers were acknowledged against the criteria, and no government money as forthcoming. This left schools without a government supported hardware purchase and without even a definite software platform on which to share programming. The State Service Commission evaluation report was not circulated at the time. It took the involvement of the Ombudsman before this report was released in May 1984. Based on the analysis in this report the government would have been embarrassed by the results of the evaluation. The Poly was arguably no better than the fifth place getter in the list of five computers.

The end of the Poly

The Poly did not disappear after the failure of the government to finance its entry to schools. Polycorp sold a number of units overseas, besides the numbers it sold to no more than a dozen secondary schools. Considerable lobbying of the government occurred by private sector partners to the Poly, even into the time of the next government – but to no avail. There was no government money available to spend on educational computing and a return of the Poly to the policy context would no doubt have been politically risky.

Following on from the demise of the Poly, Merv Wellington moved away from educational computing and put his efforts into the Core Curriculum Review and a more 'back to basics' educational approach. With the exception of the computing component, this approach aligned with the philosophy of *A Nation at*

[68] Briefing paper 2109 to the Minister of Education 28 October 1982 ABEP w4262 17/1/126/ Part 7.

Risk. A few recommendations from the Consultative Committee were continued and these are discussed in the following chapter.

Chapter Six

The CCDU and the fourth Labour government (1984 -1990)

After the Poly, it would be more than a decade before educational computing would be such a high priority for the New Zealand government. The lack of success with the Poly was not the only reason for educational computing becoming a low priority. The time of the fourth Labour government made significant changes to the political and economic landscape in an effort to correct the poor performance of the economy. The lack of funds and the efforts put into its social, economic and educational reforms meant that the significant educational computing policies Labour had campaigned upon were not implemented. In a context where 'market-based' reforms were rapidly and fundamentally altering the economy, the Fraser/Beeby educational settlement was replaced in 1987 with an economic and instrumental view about the role and nature of education. This process also led to the development of the *Tomorrow's Schools* policy. In essence, although the Labour government did not have the funds to implement a comprehensive educational computing policy, it laid the groundwork for the business-based, economic rationales that would be the basis of the ICT strategies of the late 1990s.

The educational computing policy that was implemented from 1984-1990 was based around the operations of the Computer Courseware Development Unit (CCDU). Following its inception in 1983 the Computer Courseware Development Unit was the Department of Education's contact point for the development of educational computing across the school sector. The CCDU evolved into the CEDU (Computer Education Development Unit) in 1986 as it broadened its focus to include tool uses of software and educational computing in primary schools. Outside of the CCDU/CEDU there very little funding for the educational computing in schools. School expectations were in part managed by a large group of case studies into the use of computers in the classroom – the Exploratory Studies. The Exploratory Studies were a less expensive, although

arguably more well-intentioned, approach to computers in classrooms, than the policies which Labour had campaigned upon.[1] The helpfulness of the Exploratory Studies would have been enhanced if the evaluations of each initiative had been fed-back to schools and/or published in a timely manner. Part of the reason why many of these studies were not released may have been related to their questionable merit. Indeed the results they generated would arguably have better supported a case against computers in schools. In the changeover to *Tomorrow's Schools* in 1989, the Exploratory Studies appear to have been left behind. The CEDU was dissolved and in its place were six roaming advisers who worked from the Colleges of Education.

In the following year the Consultative Committee on Computers in Schools (Sallis) was convened. After the August 1989 resignation of David Lange as Prime Minister and Education Minister, the new Minister of Education, Phil Goff, hurriedly put together this small group[2] on which to develop an educational computing policy before the October 1990 election. The Sallis report called for a more coordinated approach to computers, or information technology, in schools and provided the government with a short list of options. In September 1990 Phil Goff outlined a $23 million dollar policy framework that included professional development resources and a fund that would assist low-income communities to purchase hardware and software.[3] Despite this policy, Labour lost the 1990 election, and this proposal did not proceed.

Political, economic, social and educational contexts 1984-1990

Political and economic context 1984-1990

Labour's election win in July 1984 saw an end of Robert Muldoon's government. There was a dramatic flourish to Muldoon's exit as the departing Prime Minister initially refused to obey convention and follow the instructions

[1] The policies were a computer awareness course for primary schools and the provision of adequate computer facilities and support for every state secondary school. As sourced from ABEP w4262 NS-50/2 Com-D Part 2.

[2] Eight altogether including two Ministry of Education officials, five educators and Professor Philip Sallis computing lecturer from Otago University.

[3] P. Goff (1990). *Major boost for information technology in schools.* Phil Goff news release September 19 1990.

of the newly elected (but not yet sworn in) government.[4] In some ways this dramatic opening for the fourth Labour government was a fitting introduction to what was the start of a revolutionary period in New Zealand's history. The economy turned out to be in a much worse state than was anticipated, with a huge amount of public and private debt having been accumulated by the previous administration. Unemployment stood at around 6% and would get to 10% by 1990. Double digit inflation lasted until 1987. It was a situation that arguably justified dramatic changes to the economic management of New Zealand. In such an environment most of caucus aligned with the finance Minister Roger Douglas, and a range of market-oriented economic and social reforms were undertaken.

These market-based changes to New Zealand's economic and social policies, became the focus for the new government. The post-1987, the enmity between Roger Douglas, Minister of Finance and David Lange, Prime Minister, also became the centre of the political strife dominating the government. Lange appears to have been unconvinced by the extremes of the TINA (There Is No Alternative) approach. The reforms carried on regardless and began a restructuring of the way New Zealand operated. Farm subsidies were among the first changes, followed by the goods and services tax (GST), trade deregulation, a flatter income tax system and the tight fiscal controls on inflation. Education and other social policies were focussed upon after 1987. In education the market-based approach involved transforming education from a 'public good' to an 'economic investment'.[5] As many commentators have pointed out, education's primary or sole purpose was now to build the economy rather than as a source of pluralistic, democratic and social development for the countries citizens.[6]

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[4] J. Belich (2001). Paradise reforged: a history of the New Zealanders from the 1880s to the year 2000. Auckland: Allen Lane, Penguin Press.

[5] G. Grace (1990). The New Zealand Treasury and the commodification of education. In S. Middleton, J. Codd and A. Jones (Eds) *New Zealand education policy today.* Wellington: Allen and Unwin.

[6] M. Thrupp (Ed) (1999). *A decade of reform in New Zealand education: where to now?* Hamilton: School of Education, University of Waikato.

The economic position of the government was a key factor in the Labour government not going ahead with the educational computing policies in their manifesto. The manifesto set out a range of educational policies in anticipation of a better set of government finances. Junior school class sizes, and qualification reforms were among an extensive list of educational priorities. Among this list were two policy statements for educational computing for schools.

> 11 (d) develop a programme for the provision of computer awareness education in primary schools.[7]

And

> 12 (c) the next Labour Government will ensure that every state secondary school is provided with adequate computer facilities, and support, with increasing provision for experience with other technological developments.[8]

Neither of these policies came to pass.

Social context 1984-1990

The social context of New Zealand at this time was strongly influenced by the market-based or neo-liberal restructuring occurring across the New Zealand state. Asset sales, cuts in subsidies and tariffs, budget deficits and user pays became a focus for policy. Unemployment and crime, were key social concerns[9] with unemployment rising from 6% in 1984 to over 10% in 1990 and violent crime significantly increasing.[10] The early 1980s tensions, regarding the links between technology and unemployment were less present and a 1986 Ministerial working party on science and technology focussed on technology as a potential source of employment.

> Science and technology have the power to transform every aspect of our lives. ... I consider that future economic success will be built on the foundations of organised scientific knowledge and capability. I am also convinced that the role of science and technology is especially significant for countries such as Australia and New Zealand which see a

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[7] New Zealand Labour party Education policy (1984) pp3.
[8] New Zealand Labour party Education policy (1984) pp4.
[9] Eg The Royal Commission on Social Policy (1987). *Work: its nature, role and value in New Zealand*. Wellington: Government Printer.
[10] As sourced 14 February 2006 from Howard League website http://www.howardleague.co.nz/factsheets/factsheet_19.html.

> need to move away from their heavy reliance on primary, resource-based industries to a more diverse, and skills-based economy in order to provide insulation from downturns in markets and prices for raw commodities, and to support or improve existing standards of living. We have been production pushed rather than market led.[11]

The position taken here by the committee embraces both technology, and the market economy. Such a position is very much a political position, which holds up both the benefits of technology and the market, whilst minimising the critical discussion about the negative effects of both.[12]

On a wider social level public fears concerning technology were possibly subsumed by quite different issues. The threat of nuclear annihilation intensified with the film *The day after.* The bombing of the Rainbow Warrior reinforced the country's support for the government's anti-nuclear stance. Homosexual law reform, the Cartwright report, the development of AIDS and the 1987 Rugby World Cup also made this a busy time for the social context. Video games, CDs, videos and cell phones gained a much greater prominence over this time. The increasing prevalence of such devices perhaps helped to soften the previous concerns about technology as more and more New Zealanders made use of them in the increasingly deregulated economy. At the very end of this period, in 1990, the internet made its first, quiet entry to New Zealand vis a link made by Waikato University.[13]

Educational policy context 1984-1990

Between 1984 and 1987 the education system was relatively untouched by the restructuring occurring in the economy. Russell Marshall was the Minister of Education during this period and his time in charge can be characterised as a move away from the conservative 'back to basics' approach of the Review of the Core Curriculum, towards an approach drawing on Fraser's original philosophy for education. Marshall's focus concerned teacher/student ratios and

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[11] Chairman's foreword in The Ministerial working party on science and technology (1986). *Key to prosperity, science & technology: report of the Ministerial Working Party* Wellington.

[12] J. McDermott (1990). Technology: The opiate of the intellectuals. In *Technology and the future* A. H. Teich, (Ed) New York: St. Martin's Press.

[13] 'Tuianet' see C. Lipscombe *Surf's Up: Internet New Zealand Style.* As sourced 15 November 2004 from http://www.redmark.co.nz/history.htm.

a consensus-based approach to education policy development. The 1987 Curriculum Review probably best emphasises this approach with an enormous number of teachers, students, parents and educators having their comments recognised within a document which appeared to value education as a source of human development and an important aspect in the development of citizen's within a democracy.

> Learning is more than knowledge and skills; it is the power by which we integrate these things into ourselves so that they serve our purposes as human beings who live individually and in community. learning can be carried out only by the learner; it can be stimulated, encouraged, and supported by skilled teaching in a context which is consistent with and bears out the teaching.
>
> Learners are at the centre of schooling and the curriculum. No learner should be harmed as a result of schooling. The extent to which everyone of its learners is able to experience success is a measure of the success of the school. Successful schools will help learners develop the power to be secure in their personal, cultural and national identity, and to accept the responsibilities of interdependence and independence, to form and maintain caring and cooperative relationships, to continue learning throughout adulthood, and to lead satisfying and effective lives.[14]

Despite the reinstatement of liberal-progressive ideas, it was following the 1987 election that the market-based restructuring of the economy began to focus on education. Education was such an important issue to the Treasury that the second volume of its 1987 brief to the incoming government: *Government Management*, was dedicated solely to education and how it could be improved. *Government Management Volume II: Education issues* offers a complex analysis of the nature and function of education. In constructing its analysis it includes links to such diverse commentators as the OECD and Ivan Illich.[15] Ultimately the Treasury view of education emerges presents education as a personal commodity rather than as a public good.[16] Subsequently, Treasury argued, future government 'intervention' in education should be concerned with establishing the disciplines faced by other commodity markets. Essentially this

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[14] Department of Education (1987). *The Curriculum Review*. Wellington: Department of Education pp2.

[15] J. Boston, B. Haig, and H. Lauder (1988). The third wave: a critique of the New Zealand Treasury's report on education. Part II. *New Zealand Journal of Educational Studies* 23(2), pp115-143.

[16] Grace (1990).

meant that 'quality' education should develop increased competition and choice.[17]

The publication of *Government Management Volume II* was an important watershed for economic approaches to educational policy. The origins economic ideas about education were discussed in earlier chapters. Economic and instrumental approaches to education existed within the policy context as a subordinate discourse to the notions of Fraser and Beeby. In comparison to the Currie Commission, the National Development Conference, and the educational context around the Poly (if not in the 'back to basics' mind of the Minister at the time), *Government Management Volume II* elevated the instrumental and economic justifications for education to the dominant decision-making paradigm, at the expense of the broader goals for education in New Zealand.

This dominance can be seen, for instance, in the ideology of a number of post-1987 government documents concerning education. The New Zealand planning council for instance, wrote the following in *Tomorrow's Skills*:

> Both developers of the national curriculum, and schools in choosing which non-compulsory subjects to offer students, have a role to play in making education more relevant to the new economy. In the past developers of the national curriculum have not explicitly linked curriculum to the requirements of the economy. For example, the 1988 draft National Curriculum Statement made no reference to the changing economy or altering employment patterns.[18]

The work carried of the Picot committee, and the 1989 development of *Tomorrow's Schools*, offers the best example of this ideological switch from liberal-progressive to neo-liberal, or economic and market principles.[19] John Codd's 1993 analysis, examines this shift in terms of how the tradition of equity was used alongside the market concept of choice. The tension in these terms, Codd argues, in the first instance enables a substantive agreement from educators on the nature of a new educational administration, but then

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[17] Boston et al (1990).

[18] New Zealand Planning Council (1991). *Tomorrow's skills*. Wellington: New Zealand Planning council pp21.

[19] For example J. Marshall and M. Peters (1996). The politics of curriculum: busnocratic rationality and enterprise culture. *Delta* 48 (1), pp33-46; J. Codd, (1993). Equity and Choice: the paradox of New Zealand educational reform. *Curriculum Studies*. 1(1), pp75-90.

procedurally introduces the market mechanisms related to individual Boards of Trustees and schools competing for students and funding.

The *Tomorrow's Schools* policy does not substantively affect schools until 1989. It was at this point that the Department of Education was dissolved in favour of a more policy focussed Ministry of Education. This decision ended the role for CEDU and, using a more market approach, schools were then expected to meet any educational computing needs from less centralised sources of expertise.

Educational computing context 1984-1990

The period from 1984 to 1989 saw a number of important developments in classroom computing. With the growing importance of the micro-computer came a large increase in the total number of computers in schools. Secondary schools continued to develop the number of computers they used and there was also marked increase in primary school computing in line with the increasing focus on tool applications of computers, especially word-processing, and with less emphasis on programming.

In secondary schools the number of computers grew from approximately 1600 in 1983 to 8500 by 1989. Part of the reason for the secondary school growth was connected with the increase in senior school computing. 49% of secondary schools offered senior computer studies in 1984 but by 1990 the vast majority of secondary schools had a senior computing option.[20] Despite the popularity of such courses, the department continued to see senior computing as a lower priority than the across the curriculum 'tool' applications of computers put forward by the CCDU/CEDU. Convinced of the need to use computers to improve teaching and learning across the curriculum the Department discourage senior schools computing by refusing to offer a bursary examination option for secondary school computing. In the face of computer teacher pressure the

[20] Briefing paper 1538 to the Minister of Education Undated (late 1983/4?). ABEP w4262 34/2/26/10; D.A. Nightingale and M. Chamberlain (1991). *A Study of computers in New Zealand schools: a report of the IEA Computers in Education*. Wellington: Research and Statistics Division, Ministry of Education.

Department's point of view was set out by Bevan Werry in June 1987, in a New Zealand Computer Education Society newsletter:

> The Department suggests that consideration be given also to the fact that computers are a relatively scarce resource, and are likely to remain so for some time. The computer potentially offers students in subjects right across the curriculum a very powerful learning tool. In many schools teachers are not taking the opportunity to introduce computers into their classes because of lack of access to the equipment which is perceived, rightly or wrongly, to be the preserve of computer studies. It is the department's view that the introduction of an examination subject in the seventh form would make further demands, no matter how little, on an already scarce resource. The opportunity for students who may never wish to take computer studies, to benefit from the potential of the computer as a learning aid would be further diminished.

The Department might also have been protecting the secondary system from becoming an overtly vocational arm in the development of computing skills for the market. Unlike the points of view of those after 1987, Russell Marshall actively shunned suggestions that computer sources in secondary schools were present to directly develop marketable skills. Observe the following response of the Minister to a parliamentary question from Raglan MP Simon Upton:

> Mr Upton (Raglan) to the Minister of Education: Is he taking any steps to increase the supply of school leavers and graduates with competence in computer software development, and, if so, what steps are being taken?
>
> Reply
>
> Hon C R Marshall (Minister of Education) replied: Computer software development is a skilled professional occupation.
>
> I do not consider that it is the function of secondary schools to train computer professionals, any more than it is their function to train doctors, lawyers or any other professionals. Secondary schools do, however, offer courses in computer awareness and computer studies. The latter include aspects of computer programming. My department has produced resources for both secondary courses.
>
> It has always been regarded as the function of the polytechnics and the universities to provide courses for the training of professional computer systems analysts and programmers.[21]

In primary schools the number of computers increased from approximately 200 in 1985 to over 1000 by 1989.[22] The development of the micro-computer and

[21] Question for written answer Tuesday 26 February 1985

the use of computers as tools was responsible for much of this increase. In the years between 1984 and 1990 computers did not demand the same programming skills from users and they came with tool software such as word-processors and databases. Graphical user interfaces[23] and the development of desktop publishing software provided also more approachable technology for primary schools. Certainly the Computer Courseware Development Unit CCDU (later the Computers in Education Development Unit CEDU) came to encourage primary school computing (see below). Tool applications such as word-processors and databases were more easily welcomed into the primary classroom than were the disciplines of BASIC programming, the less hands-on computer awareness courses or the repetition of computer assisted instruction.[24]

Tool applications were seen by most schools as a more enjoyable and hands-on way to experience computers. Word-processing, databases and simple drawing programmes offered primary schools a way to use computers in relatively straight-forward applications. During the mid to late 1980s there was even the opportunity to use computers in basic email encounters through the government initiated Starnet system. The Starnet system was a proto-email system that allowed schools to communicate in within a cluster of other schools. Starnet was overseen by the CEDU, through a Telecom business-partnership, with up to 200 schools involved between 1987 and 1989. The system was used for national and international student correspondence as well as email and bulletin board based projects. It cost upwards of $15 a month for schools, and the CEDU newsletters often refer to strategies that kept the costs to a minimum. The system was far from perfect and the technological limitations, and cost of Starnet, led to a significant redesign of one Exploratory Study.[25]

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[22] Nightingale and Chamberlain (1991).

[23] GUIs are basically systems that use less programming and more windows to access a computer's software

[24] A further political dimension to the waning of computer awareness is also discussed in the section on the CCDU and CEDU.

[25] D. Atmore and B. Craig (1989). Exploratory Studies in Educational Computing. *SET: Research Information for Teachers* 2 item 12.

New Zealand Computers in Education Society

While the mid to late 1980s was a time of change in education policy, the extent of this change influenced the ideas and discussion across the education sector. In this section these changes are considered in relation to the New Zealand Computers in Education Society (NZCES), and in particular the newsletters they produced over this period. The NZCES was started in 1985, as "an umbrella organisation for the regional Computer Education Societies".[26] There were eight newsletters in total produced by the NZCES with the first in September 1986 and the last newsletter produced at the end of 1989.[27] The newsletters usually contained an editorial (the first two issues did not) and then followed on with a number of articles about educational computing. The topics covered in the newsletters were as diverse as 'Interactive video in the U.K.' (August, 1987), 'Encouraging girls in computing' (October, 1988), issues of software copyright (August, 1987), senior secondary computer studies and software reviews (several issues).

The tone and content of these newsletters over time, reflects the shift in the educational context away from liberal-progressive ideas and towards a greater anxiety about the future of education and an increasingly economic rationale for the role of schooling. For instance the first editorial produced, in August 1987 was entitled 'How good are computers for children?' and considers the arguments of the NZCES Conference guest speaker Professor Joseph Weizenbaum against the use of computers[28]. The editorial goes on to provide a somewhat critical discussion of the need to clarify how computers might relate to education's "aim to achieve for the citizens of tomorrow".[29]

> But more than just defending our views, we need to be prepared to examine them critically and continually, to ensure that no exaggerated claims are being made. Computers do not provide an educational panacea and we must not be seen to believe otherwise. Are we using computers to do things that can be achieved more efficiently by other means? Are we ignoring the values that the technology carries with it? Do we recognise (in light of the Curriculum Review that perhaps a well-

[26] NZCES newsletter June, 1987
[27] The eight NZCES newsletters were variously timed at September 1986, June 1987, August 1987, Term 3 1987, Term 1 1988, October 1988, May 1989, Term 3 1989.
[28] NZCES newsletter (August 1987) pp12.
[29] NZCES newsletter (August, 1987) inside cover.

> stocked library, a remedial reading program(me), a Maori language teacher or a human relationships course may be of more benefit than computers and more desired by the community?[30].

The editorial of the Term 3, 1987 newsletter discussed the lack of policy action by the government; while the editorial of term 1, 1988 was more buoyant in response a Prime Ministerial comment about the "possibility of making large numbers of computers available to schools". [31] The editor goes on to say:

> Most of us are convinced that they [computers] can provide valuable benefits to learners at all levels: in developing basic thinking skills which are applicable to a wide range of endeavours and in developing the skills at handling information and gaining the power which will be necessary for their survival – and that of our nation – in the information age which is upon us.[32]

There are a range of ideas represented in this quote. In the first instance this quote suggests a high degree of confidence or optimism about the role of computers in education. It also reveals a bias towards both the Papertian ideas about the development of general thinking skills as well as a general endorsement of the 'tool' metaphor. Further to this tool idea however, is the emphasis placed on educational computing and national survival. Given that this statement is made by an educator, rather than a politician or computer salesman, then this represents a significant change in educational discourse. Specifically this comment represents a movement away from education for citizens, and education for economic survival.

This quote also introduces the future concerns with the 'information age'. Two of the three remaining editorials continue this theme and also emphasise economic approaches to education. 'Into the new age...?' [33]and 'Into the new decade'[34] provide a portentous introduction to the Picot report and the subsequent *Tomorrow's Schools* policy. While there is some insightful and considered ideas in these editorials, including a comment describing how the Exploratory Studies were acting as a government process to manage educational

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[30] NZCES newsletter (August 1987)
[31] Ibid. No policy proposal was formed by Prime Minister Lange in relation to these comments.
[32] Ibid.
[33] NZCES newsletter (October, 1988).
[34] NZCES newsletter (Term 3, 1989).

expectations, the 'Into the new decade' editorial is concerned with justifying computers as an economic policy strategy for education.

> What is worrying is the perception that there is no understanding in the Government that the future of New Zealand in the "Information Age" depends on the quality and type of education received by today's children and that an investment here is essential for our economic and human survival[35].

This urgency surrounding the economic nature of computers in education is some philosophical distance from the points made by the same editor is response to the ideas of Weizenbaum. Indeed the values surrounding education from 1987 to 1989 seem to have changed dramatically in the context of the wider changes occurring to the administration and structure of education.

Labour party policy and the CCDU/CEDU

The Labour party came to office in July 1984 with two key educational computing policies.

> 11 (d) Develop a programme for the provision of computer awareness education in primary schools

And

> 12 (c) The next Labour Government will ensure that every state secondary school is provided with adequate computer facilities, and support, with increasing provision for experience with other technological developments.[36]

Neither of these policies were developed. The costs of the educational computing, along with the persuasion of the Departmental officers, meant that Russell Marshall adapted his policy position. In this adapted position, the CCDU became the pivot of government's policies for educational computing. Instead of the provision of computer awareness for primary schools and "adequate computer facilities" for secondary schools, the Labour government oversaw the 1986 transformation of the 'software and programming' CCDU into the 'computer as tool' CEDU. Labour also introduced the Exploratory Studies, which became an important part of the CEDU's work.

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[35] NZCES newsletter (Term 3 1989).
[36] Labour Party education policy (1984).

The Computer Courseware Development Unit (CCDU) began work in 1983, during Merv Wellington's time as Minister of Education. As was outlined in the previous chapter, the rationale for the CCDU was based on the idea that the use of computers depended on schools accessing good quality software.[37] This understanding originated from the Consultative Committee on Computers in Schools. The committee's 1982 report recommended that:

> A Courseware Development Unit should be established within the department of education, to have oversight of he production, evaluation and distribution of courseware and software suitable for New Zealand schools.[38]

The CCDU sent its first newsletter out to secondary schools in March of 1984. In a defensive beginning the CCDU linked its role to the evaluation process involving the Poly computer:

> It must be realised that many of the proposed practices and procedures to be followed by the unit were not yet fully formulated...
>
> The unit will be established with each of four of the microcomputers named as a result of the evaluation exercise undertaken by the Department and the Computer Services Division of the State Services Commission in late 1982. The fifth machine, NEC, has not been included because it appears not to have been purchased by any school. It is proposed that courseware activity will, at least in the initial stages, be concentrated on these four machines.[39]

From this basis the CCDU evolved and developed its support for educational computing in New Zealand. An undated file-note also helps put into perspective the priorities of the CCDU at this time. The file-note, which appears to have been produced after the first CCDU newsletter, is headed 'Computer Courseware Development Priorities', focuses on the production of courseware for curriculum areas and the "promising" use of computer tool packages. It does not mention computer awareness and is disparaging about computer studies as a senior secondary subject:

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[37] Indeed this rationale was part of reason for the Department's investment in the Poly as a possible single platform for New Zealand schools.

[38] Department of Education (1982). Report of the consultative committee on computers in schools Wellington pp9.

[39] CCDU Newsletter 1.

> The computer is not an end in itself. Computer studies is a small (relatively) unimportant senior secondary subject.[40]

The use of tool software by schools emerged over time as the main focus for the unit. As the above mentioned file-note also suggests, the courseware and programming emphasis was apparently poorly received by teachers and other Departmental officials at the time. In this context the emphasis in the CCDU newsletters shifted from 'courseware' to 'tool' applications, in line with shifts in the educational computing context. Hence in 1986 the CCDU removed the reference to Courseware in its title and became the Computer Education Development Unit (CEDU) in 1986.

In the focus on tool software, the Labour party's policy of computer awareness for primary schools was also not prioritised by the CCDU. Computer awareness for junior secondary students had originally been recommended in 1982 by the Consultative Committee on Computers in Schools.[41] The Department of Education subsequently published the *Computer awareness course for junior secondary schools* in 1984.[42] This course covered the history of computers, the parts, logic, applications and functions of computers, computers in shops and offices, computers and employment, how computers affect people and computers as a problem solving tool and the ubiquitous computers and the future. As might be gathered from the topics, a generous allocation was given to the social aspects of computing and providing students with time to reflect on such. The introduction of the course emphasises its practical nature although there is very little "hands-on" work with computers.

The computer awareness cause was not helped by the fact that the Department did not manage to get the computer awareness teacher guide books to schools until April 1984. The CCDU gave the books an introductory note in the first newsletter, and apart from a couple of short references to the original computer

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[40] CCDU undated file-note (circa 1983) file no. ABEP w4262 NS 50/2 com-d Part 3.
[41] Department of Education (1982). *Report of the consultative committee on computers in schools*. Wellington: Department of Education pp8.
[42] Department of Education (1984). Computer awareness – a course for junior secondary classes: Teacher's guide. Wellington: Department of Education.

awareness publication, and a note to amend a post-publication error, computer awareness did not warrant any further discussion in the CCDU newsletters.

The development of the computer awareness course was also overtaken by the development of the micro-computer. Micro-computers were increasingly common in schools from 1984, and their proliferation does not seem to have been anticipated by the writers of the course. With micro-computers, it was assumed that students could develop computer awareness through their use of the computer. The computer awareness course promulgated by the Department was more oriented to understanding the social implications of the computer. With the technology more readily available, it seems to have been to tempting to move away from the social implications of technology to explore the tool functions of micro-computers. The effect of this shift however, was also to move away from the humanitarian concerns of computer awareness to focus more on the technical aspects of how to use a computer.

The movement away from computer awareness (and towards tool applications) was actively pursued by the CCDU staff. In the undated file-note referred to above, the role of tool technology was highlighted thus:

> The most promising uses of the computer appear to be a student tool. Several commercial software packages eg database program, word-processing program, electronic spreadsheet etc etc are suitable for classroom use.[43]

Similarly, in September 1984, the minutes of a CCDU meeting involving the Director-General of Education, one of the 'final thoughts' voiced at this meeting involved a particular strategy regarding computer awareness:

> We must unhook the Minister from Computer Awareness.[44]

Whether or not a strategy was put into effect, at least one Departmental brief was written arguing that computer awareness in primary schools was a potentially expensive and unsuccessful policy approach.[45] For whatever reason,

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[43] CCDU undated file-note (circa 1983). file no. ABEP, w4262 NS 50/2 Com-D Part 3.
[44] 7 September 1984 meeting, file no. ABEP w4262 NS 50/2 Com-D Part 2.
[45] Computer awareness in primary schools brief, file no. ABEP w4262 NS 50/2 Com-D Part 2.

the Minister seemed to be less 'hooked on' computer awareness. By the end of 1984 he endorsed an overseas trend towards micro-computer-based tool applications. Observe the following Ministerial letter to a primary school concerned about computer awareness:

> An election policy of the Labour Party was that computer awareness programmes would be introduced into primary schools. Overseas experience seems to suggest that the everyday use of the computer as a classroom tool, for example, using an appropriate word-processor for writing, can serve the double function of improving children's skill and also making them aware of the potential of the computer. Experience also seems to suggest that programming is an inappropriate activity for primary aged children. I have already announced that I intend to set up a number of studies into the use of computers in primary schools, in order to establish what are the most effective uses of the computer in the New Zealand context. Some time next year I hope to be calling for study proposals from schools.[46]

Exposure to a word-processor is unlikely to serve as a way of primary aged students to consider how the social implications of computer technology are manifest in society. The emphasis from the Department officials however was focussed on the inherently positive effects of 'technology as a tool', and the social implications of computers in education became far less important.

The Exploratory Studies

Although the Labour party had made an election promise to "ensure that every state secondary school is provided with adequate computer facilities", there was very little finance available for such a policy. Instead, the Minister focussed on an alternative educational computing policy: the Exploratory Studies into educational computing. The Exploratory Studies met two policy objectives for the government. In the first instance they provided research on the use of computers in the classroom. They also provided a way to manage the expectations of schools and parents.

At the conclusion of the studies the latter of these objectives was more successfully fulfilled. The Exploratory Studies achieved, at best, only mixed results. Moreover, the findings of these studies arguably provided some cause

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[46] Letter from the Minister of Education to Mr M Spencer 21 December 1984 file no. ABEP w4262 40/13/46 Part 1.

for concern regarding computers in the classroom. Only a handful of the Exploratory Studies were ever published.

The Exploratory Studies policy was announced in July 1985. The studies were to begin in February 1986, and were scheduled to end nearly three years later in 1988. The NZCER managed the evaluation and reported back to the CEDU in 1989.[47] According to a Department briefing paper the Exploratory Studies:

> were designed to provide information on three aspects of educational computing:
>
> - to explore the most effective uses of microcomputers in New Zealand schools;
> - to investigate methods of teaching and appropriate uses of microcomputers within existing curricula; and
> - to provide information leading to the creation of new departmental policy.[48]

$960,000 was set aside for the studies over four year time frame for this research. This money covered the equipment and research costs.[49] No Departmental money was set aside for the professional development or training needs of the participating teachers.[50] Schools did not own the equipment used in their classrooms but they were able to purchase it after the studies had concluded.[51]

More than 200 proposals were submitted by more than 100 schools to participate in a programme. In September 1985, 19 projects were selected as fully funded studies, with a further nine projects receiving partial funding. Of the fully funded projects, 55 primary and secondary schools, and 2 kindergartens were included, with a carefully selected range of geographical and

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[47] Atmore and Craig (1989).
[48] Briefing to the Associate Minister of Education 1285 Exploratory studies in the uses of computers in education (Oct 1987). ABEP w4262 50/2/Compm Part 3.
[49] Background notes for the Minister of Education, oral question 10, 8 July 1987
[50] NZCER (1987). *Exploratory studies in educational computing* (Exploratory studies in educational computing update report.). CEDU: Department of Education. This report does note that nine days per teacher were set aside for the administration of the research.
[51] The money made from selling the equipment financed the action-research studies which used a similar approach to the Exploratory Studies.

socio-economic features. Over 2000 students and 100 teachers were directly involved in the fully funded projects.

The research connected to these projects reflected a hopeful exploration of classroom computing. The methodology essentially placed computer technology within an educational setting and, with some sense of expectation, waited to see what would happened. Anecdotal evidence was used in the first instance, and various curriculum-based testing approaches were subsequently undertaken by the NZCER research staff. An underlying optimism was at work in this methodology in that it was assumed that there would be a significant educational benefit in a variety of processes which placed the technology at the centre of the educational experience. Included in the projects were:

- The role of word-processing in students' written language
- Creating and using databases in the classroom
- Videotex in primary schools
- Introducing microcomputers as writing tools
- Using the word-processor to develop skills of written expression[52]

As the projects got underway, the CCDU/CEDU staff were able to visit many of the sites and speak optimistically about the projects – especially those involving word-processing.

> Although it is too early to draw any definite conclusions from the Exploratory Studies it has become clear that they have contributed to heightened self-esteem for many of the participants... The enthusiasm of the participating children and teachers has been quite outstanding.
>
> Among the variety of computer-based activities which have been investigated, the word processor in particular has emerged as a powerful learning tool to enhance the quality of children's writing.[53]

This enthusiasm also seems to have encouraged the CEDU to develop a similar smaller-scale event, known as the Action research studies. In the Action research studies schools were provided with a modem and access to the Starnet

[52] NZCER (1987).
[53] Briefing to the Associate Minister of Education 1285 Exploratory studies in the uses of computers in education (Oct 1987). ABEP w4262 50/2/Compm part 3.

system. Very little published information was released regarding these studies, although the evidence from CEDU newsletters suggests they followed a similar pattern to the Exploratory Studies, including logistical difficulties, teacher enthusiasm, optimism for success, anecdotal success but with questionable final outcomes.[54]

In 1987 the NZCER produced an update report on the Exploratory Studies. This report was upbeat about the use of computers in schools. Drawing upon observational evidence the reports of participants it noted:

> In many of the studies teachers commented that children felt positive about the activities in which they were involved. Children report feeling a sense of independence when working at the computer and satisfaction in their ability to control the technology and the results they can achieve with it. The satisfaction with achieved results was particularly true in the case of some of the formerly reluctant writers using a word processor.[55]

But even within the upbeat update from NZCER, there were signs of problems within the Exploratory Studies. Many of the final Exploratory Studies projects had been grouped together from the initial proposals. This grouping undermined some of the studies and led to significant difficulties the way they were organised. Equipment supply and delivery problems also affected the beginning of the study. This in turn, led to problems with service support. After the initial delays most of the studies did not begin using the computers until the second term in 1986.[56] The long time-frames were also affected by a lack of continuity amongst staff and students. The staff turnover problem alone "affected nearly all of the studies to some degree or another".[57] The lack of teacher release days for professional development also meant that "some teachers took a very long time to become comfortable with the equipment and its use in the classroom", "especially in the schools where the study took a different shape to that which had originally been submitted".[58]

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[54] See also D. Stanley (1996). From starnet, to schools network: A history of computer—mediated communications in New Zealand schools. In *Words have Wings* K-W. Lai (Ed). Dunedin: Otago University Press.
[55] Exploratory studies in educational computing 1987 update report pp6.
[56] Which would have been the end of May in the three term year.
[57] NZCER (1987). pp3.
[58] NZCER (1987). pp4.

According to the NZCER, the participating staff and students did however, enjoy working with the computers. Most of the schools also purchased the computers once the studies were completed.[59] It is doubtful though whether these studies revealed computers to be the "powerful learning tool" anticipated by the Departmental officials. There was certainly some delays in getting information from the Exploratory Studies. The NZCER took a long time to analyse the data gathered from the studies, although the CEDU produced its policy paper before NZCER's results were finally analysed. Only four studies were published with study 6, *Using the word-processor to develop skills or written expression* eventually published in 1995, seven years after the data was gathered. Its abstract offers a clue as to why the publication might have been delayed. NZCER had not been able to collect any evidence that word-processors were beneficial to classroom writing. Notice the guarded manner in which this is discussed (emphasis provided):

> The results from the qualitative data show that most of the case-study pupils improved their writing during the study, but the pattern of development varied from pupil to pupil and was inconsistent even for the same pupil. It is unlikely that the improvements in the pupils' writing, where these occurred, could be attributed ***solely or largely*** to the use of the word processors. There did not appear to be a noticeable improvement in students' spelling because of the availability of the spell-checker, however the word processors may have provided a positive boost for some pupils, and were generally considered in a favourable light by their teachers.[60]

Outside of the policy paper prepared by the CEDU paper, no policy work directly emerged from the Exploratory Studies. After taking four years to prepare the Exploratory Studies had, at best, left the policy context with very much in the same educational computing position as it had started with in 1984. There was no explicit policy position and no money to purchase computers for schools. It was not clear how the government should proceed and there was parental and school expectation for positive policy action.

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[59] Briefing to the Associate Minister of Education 1285 Exploratory studies in the uses of computers in education (Oct 1987). ABEP w4262 50/2/compm part 3.

[60] NZCER (1995). Evaluation of exploratory studies in educational computing: using the word processor to develop skills in written expression. Wellington pp iii.

The Sallis Report

The limited use made of the Exploratory Studies was at least partially linked to the administrative changes occurring in education at this time. In October 1989 the CEDU, along with the rest of the Department of Education was disestablished to make way for the Ministry of Education. In the place of the CEDU a set of educational advisers were located at the Colleges of Education. With the removal of such operational divisions as the CEDU, the new Ministry of Education focussed on being a 'policy-based' government agency.

Educational computing policy was not at the forefront of the new Ministry's policy programme.[61] Just before the Department made way for the Ministry, the CEDU had prepared a policy paper for the Minister of Education regarding the Exploratory Studies. This does not appear to have been influential in the post-Tomorrow's Schools environment. No mention this paper was found in relation to decision to create the New Zealand Consultative Committee on Information Technology in the School Curriculum (Sallis). In a memorandum to the Cabinet social equity committee, the new Minister of Education, Phil Goff[62] makes no mention of the Exploratory Studies, opting instead to provides a background of computer education policy that jumps from the origin of the CCDU, to the disestablishment of the CEDU, to the work of the Sallis committee. [63] It should also be noted at this point that the emphasis in the policy context shifts from educational computing to the broader concept of information technology, involving such devices as faxes and cameras alongside computers.

> In May this year [1990], on my initiative, the Ministry of Education established a Consultative Committee on Information Technology in the School Curriculum.[64]

In essence the Sallis report (1990) was a pre-election attempt by Labour to develop an approach to information technology. In terms of policy precedents therefore, the Sallis report has something in common with Merv Wellington's

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[61] Atmore & Craig (1989).
[62] Phil Goff took over from David Lange when he resigned as Prime Minister and Education Minister in 1990.
[63] Cabinet Social Equity Committee SEQ (90). M 22/6 August 8 1990 Funding for Information Technology in Schools.
[64] Ibid

hurried *Review of the Core Curriculum*. It took the Sallis committee just two months to consider the submissions and to write a final report. The Minister of Education, Phil Goff announced a $23 Million package 10 weeks later – a package that had yet to gain Cabinet approval, and which the Treasury and the State Service Commission had already suggested be declined.[65] After Labour lost the October election in 1990, the professional development recommendations, designed in response to the Sallis report, survived the change of government, a portion which equated to roughly 40% of the Phil Goff announced policy.

The terms of reference of the Sallis committee were designed around the assumption that computers are naturally beneficial to the curriculum.

1. To recommend to the Ministry of Education policy goals for information technology within the curriculum of New Zealand schools.
2. To prepare options for achieving key objectives derived from policy goals.
3. To estimate the implementation costs of the options.[66]

In the discussion following the terms of reference, the Sallis report quickly established the 'truth' that computers are a natural and important part of educational improvement:

> Research in New Zealand and overseas has shown that access to computers and related information technologies improves the effectiveness of children's learning in almost every part of the curriculum.[67]

What is interesting about the first paragraph of this introduction is that the research quoted is the Department of Education Exploratory Studies. No account is given of the considerable range of problems that were associated with the Exploratory Studies, including the lack of any significant success even with word processors and writing. There is also no obvious use of any literature

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[65] Papers supplied under the Official Information Act see for instance Cabinet Social Equity Committee SEQ (90). 81 August 7 1990 Funding for Information Technology in Schools.
[66] Consultative Committee on Information Technology in the School Curriculum (1990). *Report of the Consultative Committee on Information Technology in the School Curriculum* (The Sallis report). Wellington: Ministry of Education pp2.
[67] Ibid pp3.

critical of classroom computing. The following paragraph of this introduction also shows an explicit link between information technology and the skills required for a restructured economy. The Sallis committee make economic utility a significant strand of their argument justifying computers in schools – and second only to the 'obvious' benefits of computers in education.

> ... it is predicted that by the year 2000 the proportion of our population employed in the service sector rather than in manufacturing or primary production or processing will have risen from 65% to more than 75% ...
>
> Many authorities acknowledge that education must prepare students for a working life dominated by information technology.[68]

The economic and optimistic views regarding information technology are more pertinent given the background of the committee members. All the members of the committee were linked to education, with two of the eight members working as College of Education lecturers at the time. All the participants could also be described as techno-advocates in some degree, while Philip Sallis, who was a computing (rather than education) academic, was also the president of the New Zealand Computer Society at the time.[69] Arguably this was a group that not only had optimistic views about computers and education but had also readily absorbed aspects of the *Government Management* or economic point of view about education.[70]

In light of the terms of reference and the subsequent optimistic and economic justifications about the benefits of computer technology, the committee also made the slightly unusual step of stating the following:

> The committee therefore asserts that the following ought to be the policy goals for New Zealand education:
>
> Goal 1:

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[68] Ibid pp2.

[69] This should not be confused with the New Zealand Computers in Education Society, which was made up of educators. The New Zealand Computer Society is still active as at 2004 and continues to be a conglomerate of computing interests associated mainly with commercial uses of computers.

[70] Besides having an education background, this group also had various connections to educational computing. The committee chair, Professor Philip Sallis was an information science lecturer from Otago university, and somewhat ironically, had the least amount of experience in terms of the needs of compulsory education. There were two ex-members of the CEDU and both of the College of Education representatives lectured in computer studies.

> That all students will have the opportunity to increase the efficiency and the effectiveness of their learning at all levels and in all subjects through the appropriate use of information technology.
>
> Goal 2:
>
> That all students, through access to appropriate information technologies at all levels of education, will leave school with the necessary skills to take their place in an information society.[71]

The word asserts attracts some attention in the above statement. It seems unusual to build a policy position on the basis of an open assertion. From one point of view the boldness of such a statement defies argument about the utility of computers and education.

The other notable point about these goal statements is the instrumental qualities of goal 2. This is the discourse of workplace 'skills' and the 'needs of the future'. In an educational policy context that had no longer used 'public good' justifications for education, such a goal statement demonstrates the success of neo-liberal ideas in the educational policy context. As was stated in the July 1990 Budget document *Economic Growth – Social Policy*:

> The Government recognises that in a world where information technology is altering the face of society and the economy, there is a need to ensure that all students acquire information technology skills.[72]

Based on the Sallis report, Phil Goff announced a $23 million package to support computers in schools on 19th September 1990. Goff's announcement made reference to the two (asserted) goals of the Sallis committee to justify a package which included professional development, resource materials, a national co-ordinator, a $12 million fund to help schools in poorer communities and the inclusion of information technology in the new national curriculum.[73] It was five weeks before the election.

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[71] Sallis (1990) pp3.

[72] Supplied under the Official Information Act, this phrase was quoted in a letter from Phil Goff to Rt Hon Helen Clark Chairperson Cabinet Social Equity Committee 3 August 1990.

[73] Papers supplied under the Official Information Act Phil Goff press release *Major boost for information technology in schools* 19 September 1990.

The announcement made by Phil Goff, understandably, did not include any reference to the dissenting comments made by the State Services Commission and the Treasury about the cost and philosophy of his proposal. Neither agency considered that the tenets of the proposal aligned with the decentralised management approach of the recently introduced *Tomorrow's Schools* changes and the costs were not welcomed in an environment where the government were still running deficits. While not actively opposed to computer education the argument from the Treasury and the SSC suggested that schools be bulk funded so they could decide for themselves how best to use their resources. Phil Goff and the Ministry of Education was encouraged by Cabinet to find the money from within the existing Ministry budget. According to the files supplied by the Ministry of Education this was not agreed to before the election.[74]

The end of the Labour government

On October 27 the fourth Labour government was defeated in the election. At the end of their term education and education policy had become more closely aligned to economic policy. While the government finances were still problematic and government spending on computers continued to be difficult to justify. Additional spending on computers also appeared to contradict the *Tomorrow's Schools* approach focussed on allowing schools to make their own decisions about the educational needs of their students. These were the basic policy problems facing the National government in the 1990s: how to develop a cost-effective educational computing policy without compromising the newly developed autonomy of schools.

[74] Papers supplied under the Official Information Act.

Chapter Seven

Tomorrow's Schools, ITAG and the development of the first ICT strategy (1990-1998)

Aside from Chapter Four, this chapter covers the longest time period in this thesis. This is not to suggest that the years from 1990-1998 were a period of calm in education or educational computing policy. The 1990s was one of the busiest reform periods in New Zealand education's history. It involved the introduction of new administrative, curricula and qualifications systems. Educational computing also transformed over this period, from computers that were linked to black and white monitors and utilised mainly for simple word-processing to considerably faster machines that were accessing the internet and presenting multi-media images and sounds. And while the government's only substantive IT[1] policy initiative in the early and mid 1990s involved the financing of a considerable amount of professional development for teachers, the years between 1990 and 1998 were also part of the long lead time in the development of the first ICT[2] strategy – *Interactive Education. Interactive Education* is an important milestone in the history of educational computing policy of New Zealand. In one respect, it marks the government's first attempt to strategically manage educational technologies.[3] From a more critical perspective, it also the first educational computing policy that was strongly linked an economic or 'busnocratic' approach to education.[4]

This chapter is divided into two sections. Part One discusses the important contextual developments of this period included the minor policy initiatives developed by government. It begins with a description of the political and social

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[1] Information Technology

[2] Information and Communications Technology. By 1998 IT had become ICT.

[3] The term educational technologies is used here rather than educational computing because it was at this point that 'information technology' was more commonly used in the policy context. Educational technology and information technology refer to a broader group of technologies than computers alone. Alongside computers, telecommunications, audio and visual equipment are also included.

[4] M. Peters and J. Marshall. (1996). The politics of curriculum: busnocratic rationality and enterprise culture. *Delta* 48 (1) pp33-46.

context of the time and the development of *Tomorrow's Schools* and the new Ministry of Education. It then discusses the wide range of policy, educational and technological events relevant to the educational computing context. This includes the development the New Zealand Curriculum Framework, especially the technology curriculum. The first section of this chapter also discusses the development of the internet, the increasing number of computers in schools and the ways in which schools used these computers. The professional development contracts of the government are included in Part One, along with a mention of the smaller quasi-government initiatives such as the schools network, net day, an IT help desk and a computer recycling scheme.

One of the key aspects of the first section of this chapter is the discussion of how the policy context endorsed a more busnocratic or economic approach to education and education policy. Such an approach is discussed in relation to issues of economic competitiveness and the positioning of New Zealand within a global economy. Information technology businesses also increased their interest in schools at this time. Much of this attention manifested itself in marketing-based voucher schemes, ostensibly aimed at helping schools acquire computers. The school-business initiatives of Telecom, as a newly formed private company, are also discussed.

Part Two of this chapter examines the policy processes leading up to the first ICT strategy. In particular this section traces the development of this strategy back to the efforts of Maurice Williamson, the Minister for Information technology, and the Information Technology Advisory Group (ITAG). ITAG was set up in 1993 by Maurice Williamson, essentially to lobby the government, parents and teachers in support of IT in schools.[5] Its focus was on the economic benefits of educational computing and the development of IT-literate workers (and consumers). It was uncompromisingly big-business based and worked closely with the Ministry of Commerce's IT policy unit as well as a number of personnel from the Ministry of Education. In May 1995 ITAG formed an

[5] Released by the Ministry of Economic Development under the Official Information Act Steve Trotter's (Chair of ITAG and Chief Executive of Unisys). presentation to the NZ Institute of Management 3 May 1995

education sub-committee based around these government officials. Aspects of ITAG's lobbying role were reconstituted in the aim of this sub-group:

> To formulate strategies for expanding the use of IT in learning by school students.[6]

Although the Ministry of Education were responsible for the publication of the *Interactive Education*, ITAG were the prime-movers in the development of an ICT strategy for schools. Between 1993 and 1998 ITAG, and its education sub-committee, worked to find a way to increase the use of computers in schools. Part Tow of this chapter critically considers busnocratic rationales of ITAG towards a school ICT strategy. The development of this strategy was no easy process and a number of potential policy avenues were explored by those in and around ITAG. ITAG originally envisaged the government investing hundreds of millions of dollars on information technology for schools but this approach was too expensive for a government dedicated to reducing government expenditure. Such an expensive proposal also contradicted the underlying philosophy of the *Tomorrow's Schools* policy in that it sought a central government solution in a framework that had only just provided schools with a sense of autonomy. In essence IT policy for schools was ostensibly caught between the potentially expensive route of mandating computers in schools and the less expensive, but more complex, process of having schools, parents and newly formed boards of trustees not only understand the 'wisdom' of computers in schools but also find the money for their purchase.

ITAG did make progress however. In 1996 the government's coalition agreement foreshadowed the development of an IT strategy for schools, albeit within the Maurice Williamson's portfolio area of telecommunications. The Minister and Ministry of Education were still to be convinced, although by the 1998 budget $14.3 million (excl. GST) was made available for an ICT strategy. After some uncertainty this strategy was based upon *Impact 2001 Strategies for Learning with Information Technology in Schools* - a joint ITAG, ITANZ[7] and

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[6] ITAG education joint working group 1 November 1995 meeting minutes

[7] Information Technology Association of New Zealand. Based on the information from their website www.itanz.co.nz (accessed 23 November 2005) ITANZ is the New Zealand national association of organisations involved in the development, production, marketing and support of

the Future's Trust[8] document published in early 1998. There was some relatively minor consultation with schools and an education reference group, before *Interactive Education* was published by the Ministry of Education in late 1998.

Interactive Education utilised many of the smaller educational computing initiatives developed throughout the 1990s. It also introduced the idea of 'clusters' of schools working together on professional development initiatives. *Interactive Education* did not involve extensive government investment in hardware and software, yet it was able to emphasise the government's commitment to ICT skills. As this chapter sets out, this strategy reflects its business background and a technocentric approach to educational improvement. Technology was placed at the centre of efforts to improve education and improve economic performance. *Interactive Education* demonstrated an optimistic government view of computer technology in education and simplified the nature of educational improvement. *Interactive Education* was also government's first successful attempt to build a strategic policy for computers (and other ICTs) in the classroom. In this manner it became a platform for ongoing policy developments in this area.

Part 1: Educational computing 1990-1998

New Zealand's social, political and economic context 1990-1998

Between 1990 and 1998 New Zealand's political structure, society and education system considerably altered. As National's finance Minister from 1990 to 1993, Ruth Richardson oversaw the most extreme examples of neo-liberal economics. According to Kelsey, Ruth Richardson's approach to economics was not only controversial for the electorate, but also struggled for

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goods and services related to the processing of information. ITANZ works to improve the business climate in the interests of all suppliers, through its vision and mission.

[8] As sourced from http://www.futurestrust.org.nz/ on 23 November 2005 The New Zealand Futures Trust is an independent non-profit organisation whose members aim to identify developments and changes affecting the lives and aspirations of New Zealanders, and to promote debate about possible futures. Its 2005 corporate membership included Auckland City Council Institute of Environmental Science and Research Manukau City Council Ministry for the Environment Ministry of Research, Science and Technology New Zealand Defence Force Royal Society of New Zealand.

acceptance within the Cabinet and caucus. But as the currency crisis in 1984 had helped to legitimise to the economic reforms of the Labour government, the collapse, and subsequent government bail-out, of the Bank of New Zealand, provided a degree of urgency to National's economic management. In 1991, the was a cut to the Social Welfare benefit as well as a $270 million dollar cut to Vote: Education.[9] The Employment Contracts Act was also introduced in 1991 and there were extensive reforms to the health system, including a per capita cut in health expenditure. Despite the tight controls on spending, the New Zealand government also continued to operate financial deficits until 1994.[10]

New Zealand experienced slow economic growth in the early 1990s. The official unemployment rate also reached between 11 and 12%, although the actual unemployment level of the country was likely to be much higher, as the official unemployment rate did not include those people who undertook even a small amount of work.[11] The high unemployment rate, and the benefit cuts, also meant that food-banks were in high demand. Violent crime also increased, growing over 50% since 1982. There were some commentators that suggested that New Zealand was developing some of the qualities of a third world country.

The 1991 publication of the *Upgrading New Zealand's competitive advantage* [The Porter Project],[12] seemed to chart New Zealand's decline to third world status. The Porter Project was commissioned by the Labour government in 1989, but reported back to the National government just before the 1991 budget. It examined New Zealand's 'competitive advantage' in the global economy. According to one front page article, the findings of its report were that:

> New Zealand is so far down the track of becoming a Third World economy that even a complete change in economic and business attitudes may not be enough to change the outlook...[13]

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[9] G. V Butterworth and S. Butterworth (1998). *Reforming education: the New Zealand experience, 1984-1996*. Palmerston North: Dunmore Press.
[10] Ibid
[11] Kelsey (1997).
[12] G.T. Crocombe, M.J.Enright and M.E. Porter (1991). *Upgrading New Zealand's competitive advantage*. Auckland: Oxford University Press.
[13] M. Reynolds (1991). NZ heading for third world – survey. *Dominion* 27 March 1991, pp1, 16.

The Porter Project strongly suggested that the education system was one of the ways to avert a third world standard of living. It recommended that schooling be more strongly linked to economic goals, with more emphasis on the technological:

> A central priority of our education system should be providing young New Zealanders with the skills necessary to become productive members in an increasingly competitive world. This means an increased focus on mathematics, technological subjects and languages.[14]

This approach affirmed the educational policy position developed by the Labour government, following on from *Government Management Volume II: Education Issues*. National's approach to education can best be seen through publications such as *Education for the 21st Century* and in the *New Zealand Curriculum Framework*. This approach to education policy is discussed in more detail in Part Two of this chapter.

By the 1993 election, the electorate had very little to choose from between Labour and National. Labour were still unpopular with voters and the New Zealand electorate returned the National government with a margin of only one seat. It was a difficult election for both major parties with over 30% of the votes going to small parties.[15] This was especially pertinent given that the 1993 election also saw New Zealand narrowly decide that the following general election would be carried out under a proportional representation electoral system – Mixed Member Proportional representation or MMP. The arguments around this system had included the benefits to the public connected to the breaking up the power of the executive and distributing a higher degree of control across parliament. The experience of having governments deliver such radical change to New Zealand's economic and social context, without a high degree of acceptance or mandate from the public, was most likely a factor in the electorate's decision. The small margin of victory (54%) was probably an indication of the success of those generally conservative and business interests which advocated for the maintenance of the status quo.

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[14] Crocombe et al (1991) pp168.

[15] Together Labour and National did not attract 70% of votes cast, the lowest total since their inceptions http://www.elections.org.nz/pandr/vote/seats-1993.html.

Both the margin of National's victory, and the uncertainty about the subsequent election results, seems to have influenced, what Kelsey has described as a more pragmatic leadership approach from Prime Minister Jim Bolger.[16] Ruth Richardson was not chosen as the Minister of Finance and the neo-liberal reform programme was scaled back as Bolger sought a stronger consensus within his party. One of the specific strategies Bolger employed was to place Maurice Williamson as the Minister in charge of Information Technology, a position with no actual budget, but which offered Williamson an official position from which he could advocate for New Zealand's technological advancement. In light of the delicate nature of National's parliamentary majority, Maurice Williamson was arguably not subject to the same party disciplinary processes that might be expected from a government with a more comfortable majority. As a result Maurice Williamson often expressed his strong points of view about government educational computing policy without strong sanction. Williamson comments included the lack of IT progress by schools and government. In 1995, Williamson even made reference to an upcoming Cabinet decision over whether hundreds of millions of dollars was to be invested in educational technology. Cabinet did not support this request and would not have approved of Williamson pre-empting their decision.[17]

Following the first MMP election in 1996, the New Zealand First Leader Winston Peters, after six weeks of negotiations, supported the National party in a coalition government. This coalition also moderated the neo-liberal potential of National, although it also made for a difficult political marriage. Jim Bolger was replaced by Jenny Shipley at the end of 1997 and Winston Peters was subsequently sacked by the new Prime Minister. The government survived through to the next election only with the support of several break away MPs from the New Zealand First party. In such difficult times for political managers Maurice Williamson still had scope to openly argue for policy. Throughout this time Williamson maintained his role as the Minister of Information Technology,

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[16] Kelsey (1997).

[17] D. King (1995). Williamson hints at IT funding for schools decision. *Dominion* 14 August 1995

and the carefully negotiated Coalition document, included that there would be an Information technology strategy developed within education.

> The Government will develop and implement [an] "Information and Technology in Learning" strategy that will ensure that all New Zealand children are equipped for the information age by an education system which is fully attuned to New Zealand in the 21st century.[18]

This IT strategy was not foreshadowed within the education section of the Coalition agreement, but with the Telecommunications section. This positioning reflects that in 1996 the government, including the Ministry of Education, were unconvinced of the need for such a strategy – at least an expensive strategy that did not align well with the autonomy of schools. As is discussed in the following sections the approach to the *Tomorrow's School* philosophy altered throughout the 1990s. Moreover the government's financial position also improved. Unlike in the early 1990s, the second half of the 1990s saw improvements in the government's revenue. This additional income allowed for new government spending initiatives.[19] The $14.3 million dollars (excl. GST) put aside for the 1998 ICT strategy was one such initiative.

The new Ministry of Education

When Lockwood Smith became the Minister of Education in November 1990 the Ministry of Education was still a new organisation. Under the *Tomorrow's Schools* reform of education the Ministry was to have a greater focus on education policy with schools directly responsible for their own administration.[20] According to the 1990/91 annual report of the Ministry[21]

> The Ministry of Education/Te Tahuhu o te Matauranga exists:
>
> to provide policy advice to the Government on early childhood, compulsory and post-compulsory education, including employment-related education and training;
>
> to ensure effective, efficient and equitable implementation of the Government's policies; and

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[18] *Coalition agreement* December 11, 1996 Wellington, New Zealand: New Zealand Government

[19] P. Briggs (2003). Looking at the numbers A view of New Zealand's economic history Wellington: NZIER

[20] Ibid

[21] Ibid

to advise on the optimal use of resources allocated to education.[22]

The local autonomy provided to Boards of Trustees were supposed to deliver a more flexible, competitive and efficient provision of education.[23] From the beginning however, the purity of a 'small policy Ministry' did not align with the work required in the education sector. For instance the regional offices were retained along with a number of operational components, dealing with transport and property.[24] Over the course of the 1990s the evolution continued away from the policy ministry and towards operational aspects such as centralised programmes for truancy, school improvement and, by 1998, ICT policy. Over this period the government also strengthened its control on schools through school charters, national curricula, funding mechanisms and the National Educational Goals.[25] In effect the original rhetoric concerning the autonomy of school was negotiated through new forms of government intervention and compliance.

Increasing control that was developed by the Ministry, mirrored the Ministry's movement away from traditional liberal educational values of the previous Department towards the neo-liberal views of Treasury. Evidence from the Ministry of Education's 1990 briefing to the incoming Minister *Quality education for all according to their needs*, shows a reluctance towards the market-based ideas. This document suggests that in 1990 the market ideas towards education, initially, at least, were still contested across the Ministry. The Beeby influenced title of this document underlined, not just a particular difficulty facing the new Ministry, but also a public servant level response to what was now the dominant policy paradigm for education in 1990. For instance the briefing notes the contradictory perspectives on educational policy evident in the points of view of 'central government agencies, employer and employee organisations, research institutions, educational institutions, and boards of

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[22] Ministry of Education (1991). *Annual report* 1990/91 Wellington, New Zealand: Ministry of Education pp5.
[23] J.Boston, B Haig and H. Lauder (1988). The third wave: a critique of the New Zealand Treasury's report on education. Part II *New Zealand Journal of Educational Studies*. 23(2), pp115-143.
[24] Butterworth and Butterworth (1998).
[25] I. Snook (1989). Educational reform in New Zealand; What is going on? *Access* 8(2), pp9-17.

trustees'.[26] Using an apologetic tone the document reasserts the idea of education as supporting 'critic and conscience' of society against the newer pushes for work place skills. In a backhanded way it also questions the arguments for education linked to an economic growth imperative, (as seen later in the Porter Project)[27] and seeks to explain the importance of a liberal-progressive approach to education. For instance:

> Economic implications for education have assumed greater importance. ... A more informed, more skilled and technologically literate workforce is required to meet the demands of New Zealand's economy. ... It must be acknowledged, nevertheless, that education cannot make jobs: the economic situation must be such as to capitalise on the knowledge, skills and attitudes developed by the education system....
>
> In achieving national education of good quality there is a need for a balance of interests between academic freedom, the autonomy of institutions, choice by the individual, the role of institutions and of the individual as critic and conscience of society, accountability for the use of public resources and responsiveness to the national need as expressed through government, national and local groups.[28]

And on page 227 in its conclusions:

Socially, education has two major tasks of:

- socialising people to be able to live and work successfully in society; and
- encouraging the innovative and critical faculties of each individual to challenge – albeit inconveniently – both in the work place and in society at large.[29]

The National government did not absorb these wider points of view for education. For example, in *Education for the 21st Century*,[30] there is very little acceptance of the broad and critical roles for education. This document contains an approach to education in line with the economic ideas that Treasury had put forward as public policy in *Government Management Volume II: Education Issues*. Such a position would remain as the dominant approach to education in

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[26] Ministry of Education (1990). *Quality education for all according to their needs* Wellington: Ministry of Education pp3.
[27] Crocombe et al (1991).
[28] Ministry of Education (1990) pp4.
[29] Ibid pp227
[30] Ministry of Education (1993). *Education for the 21st century* Wellington: Ministry of Education.

the 1990s.[31] It was a position that brought together vocational and academic learning within the explicit need for skills for the economy:

> The rapid pace of technological change, the and the explosive growth in communications we have seen over the last ten years, will accelerate as we enter the new century. New Zealand must compete in a global marketplace in which success will depend in large measure on the investment we make in education and training.[32]

As can be observed in the above quote, *Education for the 21st Century* also makes links between a more instrumental and economic focus on education with the current global and technological developments. This point of view is also evident on page 43 where it is stated that "Information technology must be part of the curriculum of every New Zealand student". The document then presents some targets for computers in schools, including an increase in the number of classroom computers from the 1994 ratio of 1 computer per 17 students to one computer per five students by 2001. The cost of providing this equipment was costed as $276 million. The ongoing annual costs, such as those related to operating and maintaining this equipment, was said to increase from a 1994 level of $47 million per annum to $157 million per annum by 2001. At no stage during the 1990s was this money provided by the government and no policy attempt was made to meet these targets. These figures were frequently referred to by those in and around ITAG. (This is discussed in more detail in Part Two of this chapter).

Information technology in schools 1990-1998

In 1991 the International Association for the Evaluation of Educational Achievement (IEA) report, *A study of computers in New Zealand schools* was published. This report provides considerable information about the number of computers in New Zealand schools and the nature of their use at the start of the 1990s.[33] The IEA report was part of an international study involving 21 countries and taking place in three stages. The 1991 report was part of the first

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[31] M Olssen and K Morris Matthews (1997). Introduction. In M Olssen and K Morris Matthews (Eds) *Education policy in New Zealand: the 1990s and beyond.* Palmerston North: Dunmore Press.

[32] Ministry of Education (1993) pp6.

[33] D.A. Nightingale and M. Chamberlain (1991). *A Study of computers in New Zealand schools: a report of the IEA Computers in Education*. Wellington: Research and Statistics Division, Ministry of Education.

stage and had the aim of essentially gathering information on the scope, nature and application of computers in schools.

According to the IEA study, New Zealand schools steadily acquired computers through the late 1980s, and by 1989 upper primary to upper secondary levels of schooling had a variety of makes of machines totalling up to around 8,500 computers.[34] At the end of 1989, primary and secondary schools were using a variety of machine makes with a processor speed averaging no more than 16Mhz and usually with no more than 1 meg of RAM.[35] Tool applications, especially word-processing were dominant, although drill and practice applications were also commonly found in schools. Colour monitors were becoming common place too – especially in primary schools.

The 1991 IEA study reported on a number of other areas of computer-based education. Teacher's knowledge of computers, equity issues, teacher training and comparisons between New Zealand and other countries are included in the broad data sets IEA has drawn together. New Zealand did not perform well compared to many other OECD countries in terms of the ratio of student to computer in the classroom (around 60 to 1). Nevertheless the results from the IEA study did not inspire any particular policy initiatives, although the report itself did suggest a number of policy implications and recommendations based on a strongly supportive position towards educational computing. The policy implications referred to the "insufficient number of computers available" and the "inadequate financial support" experienced by schools and teachers.[36] The recommendations referred the government back to the 1990 Sallis report, released under the Labour government's administration, especially emphasising the need for professional development of teachers.

In the years between the IEA study and 1998 ICT strategy, there was a large increase in the number of computers in New Zealand schools. There were 8,500

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[34] Nightingale and Chamberlain (1991) pp23.
[35] See for instance http://en.wikipedia.org/wiki/Apple_Macintosh#1985_-_1989 as sourced 5 October 2005. In 2005 computer power has increased by approximately 1000%, with many new computers having at least 1 gig (1000 Mhz) processors and around 1000 Megs of RAM.
[36] Nightingale and Chamberlain (1991) pp167

computers in New Zealand schools in 1989. By 1995 there were 52,000, with approximately 75,000 by 1998.[37] It is difficult to judge exactly the technical capability of thee computers, although on average IBM schools were using computers with 90-166Mhz processors, including 486s and early Pentiums, (running the new 'Windows 95 operating system'). Apple schools were operating a number of PowerMacs with similar specifications. At their very best, a quarter of primary schools and a third of secondary schools had computers that were less than a year old. Some of these schools would have had Pentium II 333Mhz processors, with 4 Gigs of hard-drive, and 32 Megs of Ram; some schools would have just started to purchase the brilliantly marketed iMac.[38] Compared to the 1989 position, by 1998 school technology had improved its technical specifications by around 20-30 times over and increased the number of computers by a factor of 9.[39]

This development in the number and power of computers did not appear to make for a similar increase in the innovative application of software. By 1998 the software on school computers was still dominated by word-processing in secondary and primary schools, although the graphic arts programme *Kidpix* had good showings in primary schools (39% of schools with at least one copy); and simple web-design and computer programming applications had a fair showing in secondary schools (around 25% of schools with at least one copy). CD Rom-based reference material was also popular with around 90% of primary and secondary schools having such software.[40]

Between 1993 and 1998 the number of schools with a modem and/or internet access rapidly developed too. As the table below sets out, by 1998 the majority of schools had some form of internet access on campus.

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[37] This was an ITAG estimate, which they admit may have been a little high. As sourced from http://www.med.govt.nz/pbt/infotech/it_in_schools_1998/it_in_schools_98-04.html#P1082_29399 23 November 2005

[38] See http://en.wikipedia.org/wiki/Timeline_of_computing_1990-forward for more information, as sourced 19 October 2005.

[39] Another way to think about this is that from a 1989 baseline of 8500 computers, on average New Zealand schools increased their net number of computers by 8500 computers annually.

[40] As sourced from http://www.med.govt.nz/pbt/infotech/it_in_schools_1998/it_in_schools_98-04.html#P1215_34062 7 July 2005

Table 5: Percentage of schools with a modem a 1993-1995/internet access 1995-1998[41]

Year	Primary	Secondary
1993	14	44
1994	24	60
1995	37	73
1996	55	80
1997	-	-
1998	83	94

Although there was considerable growth in the number of computers and internet connections over this period, these figures do not correlate high levels of computing activity. As was set out in the source document for these figures, "only a minority of schools (around 20%) reported that a quarter or more of their staff or students use Internet e-mail or World Wide Web during a typical school week."[42]

Parents, Boards of Trustees, Businesses and the IT initiatives in schools 1990-1998

On taking office in 1990 the National government decided against implementing most of the recommendations of the Sallis report. National did continue with a professional development programme for teachers. The funding of professional development contracts became the only substantive IT (information Technology) policy of the government until the development of the ICT strategy in 1998. 1800 teachers took part in this training from 1991 to 1993 and the programme cost the government $1.5 million, with schools providing another $0.7 million. The contracts were continued for another three years in 1993 and by 1996 approximately another 5500 teachers had participated. This extension cost the government a further $8.0 million.[43] According to two of the personnel who managed professional development

[41] As sourced from http://www.med.govt.nz/pbt/infotech/it_in_schools_1998/it_in_schools_98.html#P120_3760 7 July 2005

[42] As sourced from http://www.med.govt.nz/templates/MultipageDocumentPage____16875.aspx 11 March 2006

[43] The use of information technologies in school education. Paper prepared by the Ministry of Education for the Minister of Education 1993/94.

contracts they were successful[44] and aspects of this programme eventually became merged into the ICT strategy

While the professional development of teachers reached a considerable number of educators, many parents and school trustees were involved in fund raising for computers and collecting proof of purchase 'vouchers' in exchange for new technology. School fundraising increased substantially during the 1990s – especially after the stop placed on operational funding in 1991. From 1992 to 1997 schools had a 119% increase in their income gathered from local-fundraising, such as parental donations and various community-driven activities. A significant and increasing proportion of this finance went into the purchase of computer hardware and software. In 1996 for instance, secondary schools spent $107 million on computing resources compared with $87 million in 1995. Primary schools spent $74 million in 1996 compared with $52 million in 1995.[45]

The 'vouchers for computers' schemes also attracted a considerable amount of support from families throughout the early and mid 1990s. In varying ways schools from across New Zealand mobilised their students to collect supermarket, bread and even pet-food vouchers[46] that enabled them to have the latest technology. Both the major computer platforms, Apple and IBM computers, were involved. According to a report about one of these initiatives "[m]ore than 450,000 students, families and friends nationwide took part"[47].

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[44] D. Stanley (1995). Teacher professional development for information technology in the school curriculum. *Computers in New Zealand Schools.* November, pp3-6; A.M. Gilmore (1995). Turning teachers on to computers: Evaluation of a teacher development programme. *Journal of Research on Computing in Education*, 27 (3), pp251-269. See also R. Stratford (2000). Professional development models and the barriers to successful ICT integration in classrooms and schools. *Computers in New Zealand Schools.* 12 (1) pp7-12, 19.

[45] M. McDonald (1998). IT spending falling in mid-income schools. *NZInfotechWeekly* November 16 1998.

[46] For example A. Shelton (1995). PCs in schools campaign earns IBM pass mark. *Dominion* Monday May 29 1995 IT section pp3.
D. Levy (1995). Vouchers pay off for Onslow College. *Dominion* Monday August 7 1995 pp3 IT section.

[47] Levy (1995).

An article by Brown at the time[48] suggested that such voucher schemes encouraged a lack of strategic planning in schools. Brown noted that these schemes directed school energy into the acquisition of information technology rather than how such equipment might be best used in the classroom. Just as the raising of local funds provided a potentially unstable form of income from which to strategically develop a school, vouchers provide a single dose which still requires considerable care from a school to ensure that school programmes, software, professional development, school furniture and classroom design are aligned to the new technology. Continuing the point made by Brown, such voucher schemes were essentially effective methods at promoting IT businesses in schools. The overall outcome was therefore more concerned with marketing than education. As a manager for IBM stated at the time:

> IBM is keen to win a greater share of the school sector and campaigns such as this one certainly help us to strengthen our position in the market.[49]

The collection of vouchers for educational technology introduces the concept of business involvement with schools. A variety of educational technology businesses developed stronger relationships with schools at this time. Telecom were among the most active of businesses during the 1990s. It contributed tens of millions of dollars to schools through its various programmes during the 1990s,[50] they carried out research into educational technology in schools and, through Laurence Zwimpfer, were active members of ITAG. Telecom invested heavily in understanding their role as a corporate in the education environment especially through their corporate educational group the Telecom Education Foundation.

The Telecom Education Foundation was seen as something of a bridge between educators and the Telecom business.[51] An extensive and confidential research

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[48] M. Brown (1994). Really using those computers: after the supermarket vouchers *New Zealand Principal* Nov 1994, 9 (3) pp33-34.
[49] Levy (1995).
[50] Based on figures provided in the Telecom annual reports 1994-1998 The 1998 report notes that $40 million was spent on the schools connection programme alone between 1993 and 1998. In addition Telecom also ran a technology roadshow and various training courses for teachers
[51] Jack Shallcrass was its Educational Adviser, note the discussion of Shallcrass's ideas in the earlier chapters of this thesis

report was produced by CM research for the Foundation on the sorts of strategies to use to improve their marketing and relationship with schools. This report included discussed the use of information technology by schools and the perceptions of teachers towards Telecom and its Education Foundation.[52] The report found that teachers were often suspicious of Telecom's motives.[53] In analysing the barriers to information technology in schools this report also characterised teachers in terms of three attitudes to technology:[54]

Table 6:Three categories of teachers according to the CM research report for Telecom

	Attitude to Technology
Movers and shakers	Fundamentally astute and progressive
Wannabees	Similar to movers and shakers but stymied by low socio environment and poor administrative/funding initiatives
Reluctant acceptors	Maintaining a blocking stance toward technology. Waiting for the Ministry to provide. A preference to stay with the 'basics' of traditional learning

These categories suggest a simplistic and cynical attitude to educational computing. The inference is that all teachers should (or want to) develop their teaching through the use of educational technology. Traditional approaches to teaching and learning are not defined – but by implication, they are lacking. Telecom's analysis went on to cite the school principal as a key figure in moving the school forward – away from (what CM characterised as) an autocratic luddite scenario and towards a more 'team technology' perspective.[55] Subsequently the particular strategies the report suggested for the Telecom Education Foundation to remove barriers to information technology included:

- Involve school principals
- Overtly platform on providing equal opportunity for all, educators are sensitised to the development of elitist schools
- Ensure that the Foundation presents as upholding ethical standards

[52] Confidential Telecom Education Foundation Qualitative Research Report July 1995. (Prepared by CM research).
[53] Up until 1990 Telecom was a state asset, its sale, which was perceived to be at a low market price, was something of a marketing problem whenever high profit statements were released. See also http://www.treasury.govt.nz/assetsales/ and http://twm.co.nz/nzprivn.htm as sourced from 6 October 2005
[54] Ibid pp7-9
[55] Confidential Telecom Education Foundation Qualitative Research Report July 1995. (Prepared by CM research) pg 8

- Review the policy of charging commercial rates for downloading and line charges
- Provide a greater incentive for educators to attend professional development courses.

Ultimately it was reported that the Telecom corporation would benefit from being seen as humanised and would develop long-term loyal customers. Telecom would also be differentiated and therefore win over more of the education market:

> The principal differentiator between Telecom and other corporates is the recognition that the 'Tomorrow's Schools' initiative is strongly driven by advances in information technology. This places Telecom in an enviable position to influence educators perhaps to Telecom's own pecuniary advantage.[56]

It must be remembered at this point that Telecom were represented on a government committee to develop IT policy for schools. These points of view were not just the strategies of a company wishing to increase its share of the school telecommunications market. These points of view were understandably confidential. Ironically, many of the public announcements from Telecom on information technology in schools concentrate on the importance of information technology for education and to produce an IT literate workforce, yet it is worth noting that in this report Telecom's marketing rationales were more concerned with producing IT literate consumers and expanding their profits. From page 12:

Benefits for Telecom:	Students are: Short term persuaders Long term loyal customers

There were many other businesses that developed links with schools at this time. These businesses often developed their links through some of the smaller initiatives run by government. Many of these smaller initiatives actually struggled to succeed, although in the case of a computer recycling programme and a school's help desk, the concept was re-used in the ICT strategy. There were a number of computer recycling schemes in operation during the 1990s for instance. Telecom and IBM had their own satisfactory programmes, and the

[56] Ibid pp11

School Trustees Association also operated an unsuccessful programme.[57] A telephone helpdesk was trailed by the Ministry in partnership with a business partner, but this project did not succeed as a commercial venture.[58]

Telecom were involved in a business/Ministry of Education partnership to pilot a school's network in the early and mid 1990s. This project had a strong administrative focus, at least initially, with curriculum and professional development opportunities being developed as the project evolved. In 1991 six schools were started in the pilot although by 1996 459 schools were connected. Two evaluations were undertaken of this programme by the New Zealand Council for Educational Research. These evaluations offered poorly substantiated comments about the educational merits of the initiative and generously positive comments about the qualities and potential of the technology.[59] The complex and contradictory points made by the teacher respondents were left unanalysed by NZCER, leading to a conclusion that:

> ...there was an overall feeling that Schoolsnet was good value and worthwhile, yet improvements and needs were strongly stated, along with a message that attitude towards the network was all important in attempts to encourage it, and future promotion efforts should realise this.[60]

NZCER did not also consider the low response rates to the questionnaires used to gather most of the data for this evaluation. In the phase 1 evaluation only 162 out of 255 schools sent in at least one questionnaire, yet this was framed positively in that schools were said to be in the exploration phase because "[a]bout 35% of respondents ... used the Schoolsnet for curriculum and classroom purposes, and it was viewed as a valuable communication tool." This figure may be have been much lower with a greater response level from schools. Furthermore only a third of teacher-respondents logged on to the system more than once a week, and although the phase one evaluation noted that this was

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[57] N. Dias (1995). Computers for schools scheme needs monitoring *Dominion* Nov 20 1995
[58] Ministry of Commerce papers supplied under the Official Information Act
[59] D. Atmore (1995). *Schools network evaluation A report for the Ministry of Education by the New Zealand Council for Educational Research.* Wellington: Ministry of Education; D. Harris (1996). *Schools network evaluation phase two: A report for the Ministry of Education by the New Zealand Council for Educational Research.* Wellington: Ministry of Education.
[60] Harris (1996) ppxi.

disappointing, it optimistically concluded that training, support and suitable cost-structures would support greater success. No analysis was done about the lack of support for the system and issues connected to the implications for pedagogy and educational change, or the expressed potential of this technology versus the reality. As the concluding line of the phase 2 evaluation states:

> the potential benefit of Schoolsnet is far from being reached yet.

The Netdays initiative was a community trust/business backed venture to improve schools networking and internet connections using bulk-purchased hardware and volunteer labour. It was originally set up in 1995 by the Wellington City Council although the concept developed nationally. Netdays was based on an approach used in California and was undertaken with a degree of frustration towards the Ministry of Education. As Earl Mardle, the Netday coordinator for 1997 stated:

> The Ministry of Education is doing very little about networking in schools. New schools have it installed when they're built, but there is nothing for existing schools ... Eighty-five percent of teachers acknowledge the importance of networking, but there is not enough expertise, particularly in primary and intermediate schools to assess its value.[61]

Other business-based initiatives at this time included business sponsorship of information technology conferences. For instance Telecom and the ICT corporate watchdog TUANZ (Telecommunications Users Association of New Zealand)[62] organised and/or sponsored a number of conferences in the 1990s. TUANZ, in particular, ran annual conferences, across numerous locations, from 1995 onwards. These conferences provided a venue for bringing businesses, teachers and policy-makers together in one place. Telecom even sponsored the Ministry of Education's focus day for feedback on the first ICT strategy.

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[61] Online (1997). Plugging schools into system *Evening standard* Tuesday October 7 1997

[62] From its website www.tuanz.org.nz it describes itself as "Formed in 1986, TUANZ is a not-for-profit organisation representing the end-users of telecommunications in New Zealand. Our mission is to raise New Zealand into the OECD's Top 10 countries in information and communications technologies with a special focus on communications."

Curriculum and qualifications

Outside of fundraising and new business partnerships, schools were also busy in the 1990s with the introduction of new curricula and, in the case of secondary schools, new qualification systems. The New Zealand Curriculum Framework work began in 1991 and the overall structure and content of the curriculum was set out in 1993.[63] A great deal of school professional development time and school planning and development efforts went into the work of integrating the curriculum documents as they were introduced. Standards-based assessment was introduced in the early 1990s and throughout the mid-1990s an increasing number of secondary schools were assessing students using these standards. Two particular developments in curriculum and qualifications standout in relation to information technology: the introduction of computing unit standards for assessing senior school computing courses and development of the technology curriculum.

The development of computing unit standards[64] allowed secondary schools to develop a qualification programme that was aligned to the senior computing programmes that were already being taught in senior secondary classrooms. From 1996 onwards there were over 50 generic computing unit standards for schools to use (level 1-4).[65] These standards were based around the use of computer systems such as word-processing, databases, email and spreadsheets. There were also unit standards for assessing a student's knowledge of hardware, peripherals and operating systems as well as standards for assessing a student's investigation into the use of computers for leisure, or the management and use of computers in an organisation.

As had previously been the case, the government policy was against the development of a traditional academic pathway for computing.[66] It was argued

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[63] See Ministry of Education (1993). The New Zealand curriculum framework and See A-M. O'Neill, J. Clark and R. Openshaw (2004). Reshaping culture, knowledge and learning? Policy and content in the New Zealand curriculum framework. Palmerston North: Dunmore Press.

[64] NZQA website. Computing unit standards as sourced from http://www.nzqa.govt.nz/framework/explore/domain.do?frameworkId=545#nqf-top 11 September 2005

[65] NZQA (1996). Computing and Information Technology, Levels 1-4 unit standard matrix, Generic Computing (Part of the April 1996 assessment guide for computing).

[66] B. Werry (1987). Computer studies in the seventh form – a departmental view. *Computers in Education* 1 (2) pp9 (The newsletter of computer education society).

that such a pathway potentially limited the amount of time that computers would be able to be used across the curriculum by non-specialist classes.[67] It can be argued that the lack of an academic or specialist computing courses is counter to those economic points of view emphasising the importance of technological skills.[68] Nevertheless this policy seems to have continued in the 1990s. The lack of priority given to senior secondary school computing is underlined by the fact that the sixth form computing prescription was unchanged throughout the 1990s.[69]

The technology curriculum was published in 1995. From one point of view the development of a technology curriculum could be seen as a rationalisation of 'practical' education in New Zealand. According to *Technology in the New Zealand curriculum*:

> Technology education is a planned process designed to develop students' competence and confidence in understanding and using existing technologies and in creating solutions to technological problems. It contributes to the intellectual and practical development of students, as individuals and as informed members of a technological society.[70]

This description avoids the political intent of the technology curriculum. The introduction of the technology curriculum was also a response to the sorts of economic ideas about education that were presented in The Porter Project.[71]. In this manner, the technology curriculum an important part of the busnocratic developments to the New Zealand Curriculum Framework at this time and a

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[67] Ibid

[68] This may also add weight to the idea that the development of across the curriculum skills in students is at least as much about developing information literate consumers and/or a workforce with basic information technology skills that can readily be applied to a service oriented economy of the future.

[69] As seen in the unchanged content of the NZQA prescription for sixth form computing in the NZQA School Qualifications Handbooks between 1993 and 2001.

[70] Ministry of Education (1995). *Technology in the New Zealand curriculum* Wellington, New Zealand: Ministry of Education.

[71] See for instance J. Davies (1998). Constructing technology education: questions of purpose and fit. *New Zealand annual review of education* 8:1998 pp119-146; and also A-M. O'Neill (with S Jolley) (2004). The Technology Curriculum: Commercialising education for mindless consumption. In *Reshaping culture, knowledge and learning* A-M O'Neill, J. Clark and R. Openshaw. Palmerston North: Dunmore press.

politically-based curriculum move towards the development of an 'enterprise culture'.[72]

Anne-Marie O'Neill has provided a detailed discussion of the policy context favouring the (global) economic opinions in the Porter Project and the development of the technology curriculum.[73] An analysis of this depth is only summarised here. Particular attention is drawn to the links made by O'Neill between the government policy papers of the time, the technology curriculum and a number of OECD papers. Included in her analysis is the role played by the government policy report *Charting the Course Report of the Ministerial task group reviewing science and technology education.*[74] As O'Neill notes, the terms of reference of this report were strongly economic in their approach and clearly assumed that education was primarily an aspect of economic policy:

i. To identify current and future skills and knowledge required by society and in the workplace which are underpinned by science and technology.

ii. To identify any gaps, omission or problems which prevent science and technology education from pre-school to tertiary level, from meeting those requirements...

iii. .... to make recommendations on all aspects of science and technology education in New Zealand directed towards improving the ability of society and the workforce to meet the demands of an environment which is increasingly competitive and technologically based.[75]

O'Neill emphasises the economic perspective of the taskforce with reference to the rationales provided in their report. These rationales are based on the ideas and arguments of both The Porter Project and, in the case of the following quote, the New Zealand Employers Federation:

> The acquisition of technical and scientific skills and knowledge is essential if New Zealand is to develop a workforce – at all levels –

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[72] J. Marshall and M. Peters (1996). The politics of curriculum: Busnocratic rationality and enterprise culture. *Delta*, 48 (1), pp33-46

[73] Ibid

[74] New Zealand. Ministerial Task Group Reviewing Science and Technology Education (1992). *Charting the Course Report of the Ministerial task group reviewing science and technology education.* Wellington: Ministry of Research, Science and Technology and the Ministry of Education.

[75] Ibid pp8

> which will enable the New Zealand economy to succeed in increasingly competitive international markets.[76]

The discussion and recommendations of the report also assumes the neutrality of technology in the social and educational context. Technology is seen as a 'tool' for economic development and there is very little attempt to question the sense of progress implicit in this thinking or to understand the how non-neutrality of technology may variously affect power and social relationships. This is especially evident in the unproblematic vision of the future constructed in the report which offers up an 'innovative' and 'productive' workforce where teachers, woman and Maori can participate too. As O'Neill points out that this same philosophy underpins the technology curriculum. It is a philosophy where the opportunities and enabling qualities of technology are indivisible from social progress and the creation of equality. This is, of course, an ideological position, and one that is not confirmed by the complexity of everyday life.

Charting the course was published three years before *Technology in the New Zealand curriculum*. The process from draft curriculum to final document took two years and it attracted controversy along the way. Despite the second recommendation made by the Ministerial task group, *Technology in the New Zealand curriculum* did not have a strong or explicit relationship with information technology. Information technology was assumed to exist as a tool for undertaking technology projects – something to be drawn upon in solving classroom technology problems. It was not a particular strand in itself, and like the lack of emphasis placed upon senior computing, the absence of any explicit separate curriculum for information technology components also helped ameliorate government responsibility for the purchase of school IT equipment.

Although information technology was not a financial priority, it still appeared to be a political priority for government. This sense of priority can be seen in the comments of Maurice Williamson as the Minister of Information Technology and the work carried out by ITAG. These aspects are considered in detail in Part Tow of this chapter. In an overall sense this situation can also be summarised by

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[76] Ibid pp8

saying that there were two different sets of government priorities for information technology in schools. It might also have been the case that the education policy side of the government was unsure how to proceed in this complex and expensive area.

The potential contradiction between the emphasis placed on the technology curriculum and (the difficult to fund area of) information technology seems to have been played out in the 'technology development schools' project. Conceived of as a 'lighthouse' project for the development of the new technology curriculum, each of the four pilot schools involved made information technology an important component of their programme. However, as the project evaluator Kay Hawk has outlined, the Ministry of Education's precise reasons for setting up this project were not clear. Somewhat dryly Hawk notes that among the influential factors was that 'a member of the Ministry, as part of a trip to America, visiting a custom designed technology school [saw] the potential of such a school'.[77]

The confusion in the initial rationales and objectives for the project was one of a number of problems connected with this project. The four schools could not develop the desired infrastructure with the approximately $350,000 (excl. GST) provided by the Ministry. The costs associated with information technology put a considerable drain on this sum and a number of the key findings of the final evaluation report are dedicated to issues of the funding and cost of such equipment. The report also noted that, in part because of the poorly formed objectives at the beginning of the project, schools failed to develop the sorts of teaching and learning expected in the original optimistic expectations of the Ministry of Education. It also underlined the importance of schools having high levels of staff expertise and ongoing professional development in both the technology curriculum and information technology.[78] Schools were also challenged to develop the required level of staff cohesion needed for the innovative intent of the project. As Hawk puts it:

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[77] K. Hawk (1997). *Technology development schools evaluation.* Albany: Massey University educational research and development centre pp2.

[78] See also A. Hotere (1996). Technological beacon flickers without much hope. *New Zealand education review* 5th June 1 (5) pp10-11.

> Schools which are to be involved in a project requiring great innovation in a relatively short time frame need to be comparatively free of complications and have cohesive relationships and a high level of collaboration amongst staff.[79]

Putting aside the professional and social context of schools, the final evaluation report for the technology development schools gave the Ministry of Education scope for considering the innovation in schools. Something to look forward to in the future.

Part 2: The development of the first ICT strategy for schools

Like so many aspects of New Zealand's educational computing policy, the development of the first ICT strategy arguably deserves its own thesis. The origins of New Zealand's first ICT strategy *Interactive Education* (1998) can be traced back to 1993, when Maurice Williamson was appointed as the Minister for Information technology and made IT in education his personal priority. Between 1993 and 1998, the process leading towards the final ICT strategy involved a number of participants and a number of different attempts to increase the use of computers in New Zealand schools. Officials from the Ministry of Commerce and the Ministry of Education were prominent over this period, as were the business-linked members of the Information technology advisory group (ITAG). This chapter summarises the events and ideas that were prominent over this period, and in the production of *Interactive Education.* It concentrates its attention on the work of those in and around ITAG, Maurice Williamson's business-based advisory group for computers in schools.

The Information Technology Advisory Group (ITAG)

The period from 1993 to 1996 was a difficult time for IT policy for schools.[80] While there were some minor government initiatives aimed at increasing the amount and use of ICT in schools, other processes frustrated any substantive policy change. The first step towards an ICT policy for school was arguably when in November 1993 Maurice Williamson was appointed to the role of Minister for Information Technology. Williamson identified education as a

[79] Hawk (1997) pp82

[80] Sometime around 1997, Information Technology (IT) was replaced by the term Information and Communication's Technology.

priority area to the newly formed IT policy unit and the officials from this section soon began regular liaison meetings with the Ministry of Education. Maurice Williamson also assembled a business-based advisory group, the Information Technology Advisory Group (ITAG) before the 1993 Christmas break.[81] From this platform a number of unsuccessful attempts were made to improve the IT situation in schools. Based on the files of the time[82] 1993 to 1996 appears to have been a frustrating time for those both in and around ITAG, and for those from the Ministry of Education. Early on, some officials from the Ministry of Education were cautious about ITAG's expectations and understanding about IT in education.[83] Over time a group of officials from the Ministry of Education developed a good relationship with ITAG and the Ministry of Commerce Officials. As is discussed below, this working relationship was not representative of the position held by the senior management of the Education Ministry however. The net result for ITAG was that the Ministry were variously cooperative and obstructive of efforts to develop any sort of ICT strategy, and despite the opportunities that were discussed, no concrete policy position was agreed to by the time of the 1996 election. Instead, the achievements that could be measured involved the development of an ITAG education sub-committee, made up of officials from Education, Commerce and members of the ITAG main group and a willingness in the 1996 coalition document to develop an ICT strategy for schools within the next parliamentary term.

Maurice Williamson and ITAG

Elected in November 1993, Minister of Information Technology Maurice Williamson set up the ITAG group in February 1994 and stated that education was his priority area.[84] ITAG was made up a number of high profile business leaders with IT connections, including Ralph Norris (Managing Director, ASB Bank), Steve Trotter (Chief Executive, Unisys), Chris Kelliher (Managing

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[81] Ministry of Commerce papers requested under the Official Information Act

[82] A considerable number of files from the Ministry of Commerce, (now Economic Development)., the Ministry of Education and Treasury were requested via the official information act.

[83] Ministry of Education Technology report to SMG 9 December 1993 released under the Official Information Act

[84] Ministry of Commerce files IT policy unit discussions with the Ministry of Education – Chronology prepared by the IT Policy Unit file no. 70/6/2/1

Director Microsoft NZ Ltd) and Laurence Zwimpfer (General Manager, Business Futures Group Telecom NZ). The Ministry of Commerce's IT policy group also worked with the ITAG members and set up regular liaison with officials from the Ministry of Education.

Maurice Williamson and ITAG had a number of goals between 1993 and 1998. In a letter to the Minister of Education in March 1994 Maurice Williamson set out the following objectives for ITAG:

> Raising the level of IT awareness among parents, teachers, Boards of Trustees and principals
>
> Promoting the concept of IT across the whole curriculum to teachers
>
> Advancing both pre-service and in-service teacher training
> - mandating IT based courses at Colleges of Education;
> - increasing the funding for the in-service teacher development programme.
>
> Providing the necessary resources, in particular equipment to schools
> - increasing the resources available to Boards of Trustee for IT equipment;
> - targeting operational grant funding towards IT purchasing.
>
> Developing guidelines on purchasing, the use of equipment and course-ware.
>
> Encouraging arrangements for bulk-purchasing or leasing equipment.[85]

ITAG was primarily concerned with increasing the level of IT in schools.[86] Their approach was based on assumptions about the educational benefits of IT and the importance of IT for the economy.

> The main objective of ITAG is to ensure that New Zealanders understand, and are comfortable with, the nature, place and potential of information technology (IT) in society and the workplace. The full integration of IT into the education system is seen by ITAG as a key step towards that objective. It is also seen as a means to: improve IT skills, the efficiency and effectiveness of the education process, provide trained IT people for industry and everyday life, and to develop in students an attitude and awareness of innovation. Exposure to, and familiarity with, information technology is seen as the best means of achieving the desired ends.[87]

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[85] Ministry of Commerce files IT Policy Unit file no. 70/6/2/1
[86] Ibid
[87] *ITAG education project* February 28 1994 Ministry of Commerce file no. 70/6/2/1

ITAG valued IT skills and innovation in education. Initially ITAG gave very little consideration to pedagogy and its effects on learning and technology was placed at the centre of educational change. ITAG also lacked a degree of sophistication regarding the autonomy of schools and the *Tomorrow's Schools* role of the Ministry of Education. As a December 1993 brief from Ministry of Education notes:

> The ITAG has not fully understood the Ministry of Education's role in relation to schools' acquisition of IT; it is confusing technology education with the use of technology in education; and means of delivering the curriculum with education (i.e. learning) outcomes.[88]

As time went on, and the liaison with the Ministry of Education improved, ITAG developed more understanding of the importance of pedagogy to political discussions of learning with computers. It also developed its understanding of the other policy issues such as the role of Boards of Trustees, the Ministry of Education and the costs of improving the number of computers in schools. Indeed, as is discussed below, these issues were so well understood by those in and around ITAG that they were able to lead the Ministry of Education on what an ICT strategy should involve.[89]

ITAG's and the policy process from 1993-1996

In their first year however, ITAG struggled to develop anything more than suggestions and enthusiasm from officials and the Minister of Education, Lockwood Smith with no actual outcome. By September 1994 a draft cabinet paper had been prepared by the Ministry of Education officials in consultation with the Ministry of Commerce. The basis for this paper had been developed in relation to the calculations published in *Education for the 21st century. Education for the 21st Century* suggested that schools required an additional $276 million between 1994 and 2001 to reach a 1 computer to 5 students ratio.[90] The subsequent Cabinet paper provided a number of options for Cabinet ranging

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[88] Ministry of Education Technology report to SMG 9 December 1993

[89] See for example ITAG (1998). *ImpacT 2001 Strategies for Learning with Information Technology in Schools*. As sourced 11 September 2005 from http://www.med.govt.nz/pbt/infotech/impact/strategies.html

[90] Ministry of Education (1993). *Education for the 21st Century* Wellington: Ministry of Education pp43

between taking no action and, ITAG's preferred option,[91] of allocating $110 million annually to improve IT access in schools.

There was very little progress in this Cabinet paper in the 12 months following September 1994. According to a briefing note prepared by the Ministry of Commerce, there was an uneventful meeting between Lockwood Smith and Maurice Williamson in October 1994, with no commitment emerging from the Education Minister to invest in IT.[92] In early 1995 the ITAG group asked the Ministry of Education to provide it with information about the IT in schools situation. In response to the Ministry of Education's March 1 paper, ITAG recommended that the Ministry of Education "produce a vision for IT in schools, backed by a clear implementation strategy".[93] ITAG offered the Ministry its support with these processes.

Perhaps because of a lack of action, ITAG members made a number of the pointed public comments about IT policy for schools. One newspaper article quotes an ITAG member discussing the lack of school funds for IT.[94] One article quotes an ITAG member criticising the Ministry of Education's decision to increase teacher numbers ahead of improving IT in schools.[95] Another article refers to the public release of the ITAG inspired school IT planning template (something similar made it into the ICT strategy subsequently).[96] A member of the Ministry of Commerce's IT policy unit published a [questionable] piece on educational computing 'research' and the application of computers in the classroom.[97] In January 1995 Maurice Williamson even featured in an extensive article titled 'Evangelist for the high-tech revolution'.[98]

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[91] Notes for a meeting between Minister of Education and Minister of Information technology – 22 November 1994, Ministry of Commerce files 70/6/2/1.
[92] Ministry of Commerce files 70/6/2/1
[93] ITAG (1995). *Getting schools into IT* ITAG's response to the Ministry of Education. Ministry of Commerce files 70/3/3
[94] M. Henderson (1995). Hi-tech challenge for child education. *Sunday star times* July 16 1995 quoting Graham Prentice.
[95] A. Shelton (1995). Tait: push for extra teachers may setback IT education. *Dominion* 27 March 1995
[96] D. Levy. (1995) Apple offers guide to IT for schools. *Dominion* 14 August 1995
[97] M. Templeton (1995).Is IT a better way to learn? *LEA informer* Issue 4, Winter pp5
[98] R. Fea (1995). Evangelist for the high-tech revolution. *NZ Herald* 25 January 1995 part 1 pp9

Of special note among the public comments of this time, were those made by the ITAG Chair Steve Trotter in a March 1995 speech to the New Zealand Institute of Management. In this presentation Trotter outlined ITAG's case for computers in schools. Trotter discussed ITAG's role to lobby the government and emphasised a strong economic rationale for IT in schools. He cited changes in the structure of employment and the growing demand for "knowledge workers" ahead of manual and administrative staff. In particular he called on the government to develop an IT strategy for schools covering the:

- training of teachers
- selection, acquisition and maintenance of equipment
- complete integration of IT into teaching practice; and
- the use of IT for efficient learning as well as learning in new ways.[99]

According to Trotter such a strategy:

> will enable schools to impart the skills relevant in [an] age dominated by information processing – not redundant skills such as typing and metalwork.
>
> It is about innovative ways of delivering the curriculum using IT.[100]

One of the participants in the Institute of management meeting was Maris O'Rourke, the Secretary for Education, and she subsequently agreed to meet with ITAG. The May 1995 meeting between ITAG and the Secretary for Education had one fruitful outcome – the setting up of the ITAG education sub-group. This group drew upon officials from both the Ministries of Education and Commerce (IT Policy unit) along with a number of ITAG members. This group actually took over some of the ITAG role in lobbying for IT spending. The terms of reference for this group were set out in the second meeting minutes thus:

- The value of this group is in its ability to address issues as they arise in any manner deemed appropriate and it should not get too tied to a bureaucratic process
- The group is a think tank focussing on strategic issues

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[99] Trotter (1995).
[100] Ibid

- The group exists to provide a liaison between the IT industry and the Ministry of Education

The overall goal of the group was to "formulate strategies for expanding the use of IT in learning by school students." [101] The three major areas of influence for the group were: parents/boards of trustee; teachers/principals; and Cabinet.[102] The intention was for this group to be finished its work by Christmas 1995.[103] Instead, it continued to operate until after the October 1998 release of the ICT strategy for schools.[104]

During 1995 and 1996 much of this group's activity involved the development of IT planning material for schools and ensuring the Cabinet Ministers made visits to schools using IT.[105] The Cabinet paper requesting $110 million per annum had also made limited progress. By September 1995 this paper had been redrafted by the Ministry of Education, with the $110 million dollar purchase recommendation changed to a 'noting' recommendation. A new request had also been inserted by the Ministry of Education's asking for just $5 million dollars.

> **agree** that funding provision of $5 million per year be made to enable schools to purchase, operate, maintain and provide for replacement of information technology equipment for schools;[106]

This substantial change in the Ministry of Education's position did not sit well with those in ITAG or the IT policy unit of the Ministry of Commerce. It was also the understanding of the Commerce Ministry that these changes may have come as a result of the Minister of Education's own directions. To that end a note from the IT unit to Maurice Williamson set out their position:

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[101] Minutes of the ITAG Education joint working group 1 November 1995 Ministry of Commerce files IT Policy unit 70/5/12

[102] Ibid

[103] Minutes of the first meeting of the ITAG Education joint working group 3 August 1995 Ministry of Commerce files IT Policy unit 70/5/12

[104] The 30 March 1999 agenda includes a list of the 1999 priorities, including a bid to provide every teacher with laptop, Ministry of Commerce files IT Policy unit 70/3/3

[105] See for instance the January 1996 minutes of the ITAG joint working group Ministry of Commerce files IT Policy unit 770/5/12

[106] Recommendation i of the Ministry of Education draft Cabinet paper *The use of information technology in schools* provided to the Ministry of Commerce 4 September 1995, Ministry of Commerce files IT Policy unit 70/5/12

> Previous experiences suggest that such a small sum is likely to be greeted with anger and derision in the education sector. It is insufficient to have an impact on more than a few schools, and the effort involved in choosing these schools may well outweigh any benefit.
>
> I recommend that you discuss this with your colleague Hon Dr Smith as a matter of urgency, and seek to determine whether he has in fact given such a direction. If he has indeed done so, and this is irreversible, then you may wish to be cautious in any further public statements on this matter. If he has given no such instruction then you may wish to advise him of the Ministry of Education's change in direction.[107]

The public statements referred to included an August 14th 1995 article in the Dominion headlined 'Williamson hints at IT funding for schools decision'. The focus of this article was a comment that Maurice Williamson had made indicating that Cabinet was considering an extensive investment in IT. This comment was made well before the Cabinet decision making process had ended. With the $110 million Cabinet paper still in draft form this was an unfortunate slip by Williamson. Perhaps in an attempt to recover from any political damage the Prime Minister produced a September public comment on IT in schools. The September 25 Dominion article featured Prime Minister Bolger under the headline 'Community must decide on IT spending – PM'.

> ...each community must decide what their children will learn and how government funds are spent, says Prime Minister Jim Bolger.
>
> He made this comment to Infotech Weekly after a tour of the Wellington School [Miramar Central], organised last week by the Information Technology Advisory Group...[108]

The government did not decide to invest $110 million per annum into schools. Instead Maurice Williamson and Lockwood Smith were instructed by the Prime Minister to develop a business case for computers in schools and there were a number of meetings and interactions between the two from September 1995 to early March 1996. The evidence suggests that these meetings were not so fruitful.[109]

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[107] Note to the Minister for Information Technology 8 September 1995 from the Manager IT Policy, Ministry of Commerce files IT Policy unit 70/6/2/1

[108] N. Dias (1995). Community must decide on IT spending – PM. *Dominion* September 25 1995, pp3 Infotech weekly.

[109] Based on the minutes of these meetings no policy decisions were made. Ministry of Commerce files IT Policy unit 70/6/2/1.

A Cabinet reshuffle at the beginning of 1996 saw Lockwood Smith replaced as Minister of Education by Wyatt Creech. The change of Minister's further hindered the business case process. At least part of the reason for the loss of momentum seems to have been the indifference of the Ministry of Education. In a November 1995 summary paper prepared by the Ministry of Commerce officials a high degree of frustration expressed at the failure of the Ministry of Education to unite behind an ICT strategy:

> Despite the PM and Cabinet's apparent acceptance of the case for use of IT in learning in schools, the Ministry of Education's position remains equivocal. There is no consistent view from them over the pedagogical benefits. In fact, the varying of their position is used by the Ministry (although perhaps not consciously) as a way of seducing those who wish to improve IT in schools and then killing any initiatives they generate.[110]

Regardless of the differences there was a small victory for those in and around ITAG. It came with the election in October 1996 and the creation of a National and New Zealand First Coalition government. Within the telecommunications section of their detailed Coalition agreement, there was a broad commitment to develop an IT policy for schools. In the following two years this comment was the basis the policy discussions and debate towards the development of *Interactive Education.* These developments are discussed in the following section.

> The Government will develop and implement [an] "Information and Technology in Learning" strategy that will ensure that all New Zealand children are equipped for the information age by an education system which is fully attuned to New Zealand in the 21st century.[111]

ITAG and the events from 1997 to *Interactive Education*

In contrast to the frustration experienced in the years from 1993 to 1996, 1997 and 1998 saw a degree of urgency and activity develop around the production of an ICT strategy for schools. Besides, the political pressure provided by the promise set out in the Coalition Agreement, a contributing factor in this movement may have been connected with a number of personnel changes at this time. Besides the newly appointed Wyatt Creech, mid 1997 also saw Howard

[110] IT policy unit filenote: *IT in schools – status as at 29 November 1995*, Ministry of Commerce files IT Policy unit 70/6/2/1

[111] New Zealand government (1996). *Coalition agreement.* December 11, 1996 Wellington.

Fancy move from being the Chief Executive of the Ministry of Commerce to being the Secretary for Education. Given Fancy's support for the work of the IT policy unit it seems hard to go past the fact that he would have been sympathetic to the ideas put forward by his old department. In this context Fancy would have also overseen the 1998 appointment of Carol Moffat as the project manager for the schools information technology project.[112]

In combination with the personnel changes, the development of the ICT strategy hastened as those in and around ITAG developed their approach to IT in schools. ITAG produced a series of documents that provided leadership on this policy issue both in terms of the pedagogical and the financial issues connected with IT in schools. Part of this leadership also saw ITAG support a push from educators to see policy developments for ICT in schools. Subsequently ITAG's *Impact 2001 Strategies for Learning with Information Technology in Schools* became the basis for an ICT strategy that blended technocentric, educational and busnocratic understandings of technology and education.

Following on from the announcement of an ICT strategy for schools in the Coalition Agreement, the January 1997, response from the Ministry of Education was to re-circulate a new draft of the $110 million Cabinet paper. Again this was not successful and, based on the information they provided back to the Ministry of Education, it was Treasury who may have had the last word on this paper. Treasury had already criticised 1995, and 1996 iterations of this paper they had seen. In faxed feedback provided to the Ministry their criticism of the 1997 paper remained unchanged:

> What is the problem the paper addresses? (E.g. Sub-optimal use of information technology in schools as determined by OECD norms?)
>
> And why is this a problem? (E.g. Because a sub-optimal mix of information technology and teachers results in the inefficient production of teaching outputs? Because, by spending $100 million more on information technology, you can expect to raise student achievement

[112] Ministry of Education letter to the Manager of the Ministry of Commerce IT policy unit, Ministry of Commerce files, 70/6/2/1

> more than if you spent the same amount on employing more teachers?)[113]

The questions from Treasury were fundamental and, given the actual research information available, could not easily be answered by the Ministry. Whether Treasury's point of view sunk this paper or not, the $110 million Cabinet paper did not again resurface.

Replacing the intent of this paper with an actual strategy for IT in schools was initially, at least, slow off the ground. There were some initial meetings between Maurice Williamson and Wyatt Creech in early 1997 to no real outcome.[114] By July 1997, with some input from the Finance Minister, there was more focus and the Ministry appeared to be committed to preparing a strategy for the 1998 budget. [115] However, following on from this July 1997 position there was a policy lull. In part, this may have been connected with a change in leadership for the government, including Wyatt Creech's elevation to Deputy Prime Minister.

The Ministry of Education prepared a draft paper in time for the 1998 budget. This proposal was involved financing 13 clusters of schools, facilitators and managers to assist schools with the use of IT.[116] On Cabinet agreed to this proposal on April 6th 1998. Based on the notes provided by the Ministry of Commerce there seems to have been minimal input to this paper from either the IT policy unit or ITAG. There is for instance no reference to the Ministry's proposal in the ITAG education group notes, perhaps because it was a budget secret. Regardless the Ministry of Education proposal did not proceed. Just over four weeks later, on the 11 May 1998 the Ministry of Education presented another paper to Cabinet seeking to rescind their first proposal and use the money from this first proposal for a new IT strategy for schools. The Ministry

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[113] Fax to the Ministry of Education 10 January 1997 from The Treasury regarding their IT Cabinet paper, Treasury files GD 10/6/19

[114] Ministry of Commerce files, including for example an 18 February 1997 briefing note to Maurice Williamson from the IT policy unit, Ministry of Commerce files 70/6/2/1

[115] 8 July 1997 briefing note to Maurice Williamson, Ministry of Commerce files 70/6/2/1

[116] See Cab (98) M 12/9 (13)

were to report back by 30 September 1998 with details of how this money was to be spent.[117]

The Ministry of Education's decision to rescind their original proposal was linked to the publication of the ITAG document *Impact 2001 Strategies for Learning with Information Technology in School. Impact 2001* was provided to the Minister of Education on the same day that Cabinet agreed to the Ministry of Education's initial proposal for IT spending (6 April 1998). The report was supposed to be handed over to the Minister of Education in an earlier meeting with Ralph Norris from ITAG. This meeting did not eventuate and instead the document was provided to Wyatt Creech by Maurice Williamson, along with a somewhat terse letter from Maurice Williamson.

> The report contains detailed strategies which will meet the promises made in the Coalition Agreement and the undertakings we gave Mr Birch during the last budget round. ...
>
> ...In the circumstances, it would go a long way towards mending fences if you would write to Ralph Norris thanking him for the report, and if possible endorsing it and telling him that you have asked the Ministry of Education to respond urgently and positively on it.[118]

Wyatt Creech agreed to thank Ralph Norris for the report and stated that the Ministry of Education would provide an assessment as soon as possible. It seems that the Ministry of Education was somewhat trumped by *Impact 2001 Strategies for Learning with Information Technology in School.* The document offered a more extensive and strategic set of initiatives that the original cluster proposal of the Ministry of Education. Had the initiatives in the original Cabinet paper been announced and implemented, *Impact 2001 Strategies for Learning with Information Technology in School*, with its broader strategic intent, is likely to have embarrassed the government. As a result, the Ministry withdrew their original proposal with the May 11 Cabinet paper. And following the July 13 1998 appointment of Carol Moffat to the Ministry, they set up a reference group to "inform the development of the [ICT] strategy and discuss potential

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[117] See Cab (98) M 16/32

[118] 6 April 1998 letter to Wyatt Creech from Maurice Williamson, Ministry of Commerce files 70/5/12

new initiatives that might form part of the strategy".[119] The reference group met on 31 July 1998 on a fast-track to launch the strategy in time for the 1999 school year. The names of the participants are acknowledged inside the first page of *Interactive Education.*

Following on from this July meeting a (slightly late) paper was supplied to the Cabinet expenditure committee on October 7th outlining the initiatives that would make up the ICT strategy.[120] The initiatives in the Ministry of Education Cabinet paper mirror those developed by ITAG. The table below sets out the initiatives provided in *Impact 2001*[121] and those suggested in the final copy of the ICT strategy.

Table 7: Comparison of Impact 2001 and Interactive Education

Impact 2001 Strategies for Learning with Information Technology in School	*Interactive Education*
Help Desk Providing Information to Schools Online Teaching Resources Online	On-line resource centre A central on-line resource centre will be established to provide all schools with a mechanisms for the delivery of multi-media resources, including curriculum and administration resources using the internet. over time, the centre will include: • curriculum materials • access to a helpdesk ...(several other aspects were also listed)
Hardware and Software in Schools "There may be a role for the Government in setting standards for new equipment and for software, or at least in facilitating schools' access to reviews of education software offerings"	Promotion of a computer recycling scheme
Local Area Networking ITAG is gratified to see that Ministers are endorsing and promoting NetDay, but it does not recommend that the Government intervene directly with large scale financial support. The Government should, however, consider allowing school cabling costs to qualify for the Financial Assistance Scheme...	Financial assistance scheme Current priorities include cables for local area networking. Netday – (remains as is)

[119] 6 July 1998 letter from Ministry of Education to the Manager of the IT policy unit, Ministry of Commerce files 70/6/2/1
[120] See EXG (98) M 15/1
[121] Ministry of Education (1998). Interactive Education – An information and communication technologies strategy for schools. Wellington: Ministry of Education, pp 11-13

Strategic IT Advice and Guidance to Schools	Professional development for planning and implementation (one day course for principals)
Teacher Training ..."[O]pened to non-traditional providers" - that is, tendered for rather than simply arranged by funding the colleges of education. This would be consistent with the current Ministry of Education IT professional development proposals, which involve contestable funding.	Information technology professional development [Schools] may use outside providers or the expertise of their own teachers to deliver programmes
Learning Clusters	ICT professional development schools and clusters
Wide Area Networking: Internet	*No equivalent*

Apparently the Education reference group could only make minor changes to the suggestions put forward by ITAG. Only one *Impact 2001* recommendation was not picked up by the reference group, that of wide area networking and its impractical suggestions connected with caches. There were also minor changes to the hardware and software, strategic advice and guidance areas. The government agreed to stay out of hardware and software for now and did not pick up any role in setting standards. The government also developed a strategic guidance and advice process through the principals' workshops, a process not mentioned in *Impact 2001 Strategies for Learning with Information Technology in School.*

The consultation processes discussed in the October 7th Cabinet paper provides an insight into how educators were included in the policy process for the ICT strategy. In the consultation section of the October 7th Cabinet paper the Ministry of Education lists four sources of support in developing the ICT strategy:

a The Minister of Information Technology's IT Advisory Group's (ITAG) submission to the New Zealand Government: Impact 2001: Strategies for Learning with IT in Schools;

b Education and technology sector groups, community groups and industry;

c Reference groups of teachers, principals, ICT sector and industry representatives;

d An "Information Technology in Learning" summit for school practitioners and industry representatives, co-ordinated by the New Zealand Principal's Federation, on behalf of the Education Accord.

Notes from the Cabinet paper also show that ITAG was represented in each of these consultation sources. This consultation list is a marked contrast from that set out in *Interactive Education* itself. In *Interactive Education* only the education reference group is in any way acknowledged as part of the consultation process. In other words, the perception that could easily be taken that *Interactive Education* was essentially the product of educator input and consultation when in fact the opposite was true and ITAG were the primary architects.

The lack of educator input to *Interactive Education* is underlined through and examination of the input provided by The Education Accord at this time. The Education Accord was a group constituted by The New Zealand Principals federation is response to the Ministry of Education's perceived lack of leadership on ICT. The Education Accord held a two day summit in August 1998 with a number of different groups to discuss the outcomes and goals of ICT in the classroom. The NZPF invited an official from the Ministry of Commerce to attend a lead up meeting to this summit.

> This meeting has arisen from frustration experienced in achieving national consistency in Information Technology and in the continued lack of substantial support and leadership from the Government.

The summit itself produced an interesting document based around outcome statements for ICT in schools. It does not look anything like *Interactive Education* but the energy put into the summit and the document would perhaps have provided additional motivation for the Ministry of Education to push through with their ICT strategy – although it seems highly likely that the Ministry's strategy was already in draft form at this stage. Interestingly neither Carol Moffat, nor the Telecom facilitator for the day, Laurence Zwimpfer, appear to have revealed any of the details of the draft strategy during the summit. There is an additional irony in this, given that Zwimpfer himself provided direct feedback on the draft strategy. It should therefore be pointed out

that the construction of *Interactive Education*, received more peer-review feedback from Telecom than it did from The Education Accord.[122]

The philosophy, ideology and future of *Interactive Education*

The consultation issues related to *Interactive Education* are important given the philosophical and ideological nature of this document. The context for the creation of *Interactive Education* provide basis for understanding its technocentric, optimistic and busnocratic assumptions about education and education with information and communication technologies. *Interactive Education* was produced from a strongly economic point of view. Throughout the lead up and the construction of the strategy, technology was seen as an overwhelming positive for schools, as was the development of a technologically-literate workforce (and consumer base).

ITAG's technocentric bias is reflected in the language used in *Interactive Education.* The strategy document places ICT at the centre of educational improvement and, albeit within a nest of educational terms, sees technology as something of a catalyst, initiator and direct cause of educational improvement.

> The objectives around the national strategy for ICT in schools are to:
> - improve student learning outcomes through the use of ICT in teaching and learning.
> - increase the effectiveness and efficiency of teachers and schools by helping them use ICT to:
>
> (i) enhance the delivery of the curriculum, and
>
> (ii) reduce time spent on administration (Ministry of Education, 1998, p. 10).

And...

> Research has shown that ICT can:
> - successfully bridge the gap between in-school and out-of-school learning
> - encourage the development of higher order skills and knowledge
> - increase student engagement and motivation

The emphasis here is placed on the potential for ICT to operate in the classroom, rather than the reality. Consideration is only given to those situations

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[122] Based on information supplied by Telecom NZ. Telecom provided me with a copy of a confidential draft version of *Interactive Education* which they had been provided to review.

where technology might develop certain psychological benefits for students. Any ethical and moral aspects of education are not considered in this description of ICT's potential. Instead an optimistic point of view about technology and the classroom is put forward.[123]

Interactive Education also emphasises the role of business groups in "partnership" with the government and schools. It characterises businesses as an expert in ICT, and by extrapolation and expert in ICT-based education.

> As businesses are often at the forefront of the development of ICT and therefore have a raft of experience and expertise in a wide range of ICT, they are a key group that can assist school to achieve their goals.[124]

Given that computers are being used in the classroom context, rather than the office or factory context, this statement is invested with a busnocentric logic. It assumes that computers may be used in a similar way to how they may be used in a business context. In some ways this statement supports the argument that, in New Zealand. technology has supported a more vocational focus on the education process as it tightens the rationale for learning to a workplace scenario. If computers were to be used in a more broadly educational framework then it seems more likely that the role of business would be inclined towards the technical rather than the pedagogical. Within an educational framework, it could be expected that there would be less emphasis on how businesses could support schools "to achieve their goals" and more emphasis on how technology relates to the broad purposes of education.

But as has been discussed already in this thesis, the context for educational policy had moved away from broader, or liberal-progressive, educational goals. The purposes of education, especially education with technology, involved essentially economic and vocational rationales. *Interactive Education* reveals this approach most clearly in its Ministerial foreword, where the economic rationale for ICT in the classroom is hedged against the uncertain future brought on by globalisation:

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[123] R. Stratford and M. Brown (2002). Towards a political understanding of New Zealand's ICT strategies. *Computers in New Zealand Schools,* 14 (2) July 2002 pp3-9

[124] Ministry of Education (1998) pp6

> The challenge for the future of New Zealand will be our ability to use this information and communication potential in expert and innovative ways so that we can continue to interact at a global level. The New Zealand education system has a part in this challenge by ensuring our young people are prepared for the future to meet the changing demands of this new world.[125]

This economic approach continued in the implementation of this strategy and in the development of the second ICT strategy for schools.

The end of ITAG

The development of Interactive Education essentially brought an end to ITAG's role in education. While ITAG, and the education sub-group, continued into 1999, it had achieved its main goal an ICT strategy had been developed for New Zealand schools. As is discussed in the following chapter, the Labour-led government elected in 1999 intensified the educational interest in ICT and based the development of a second strategy of much of the economic perspective developed within the first strategy. There was very little need for business to convince those in the Ministry of Education about the importance of ICT for economic growth, it was the basis for increasing the use of ICT in schools. Trevor Mallard speech to the Compaq education conference 18 September 2001:

> For the sake of our children's learning and of our future as a society - and an economy- we must keep up with the fast-moving advances in ICT.
>
> I want to ensure that no New Zealand school - or student - gets left behind in an increasingly digital world.
>
> ICT has a big role to play in helping us improve New Zealand education, in helping our students be all they can be.[126]

[125] Ministry of Education (1998) foreword

[126] T. Mallard (2001). Speech to the Compaq education conference. As sourced, 11 November 2004 from http://www.beehive.govt.nz/ViewDocument.aspx?DocumentID=11815

Chapter Eight

The ICT strategies (1999-2004)

The period from 1999-2004 saw a proliferation in educational computing policy initiatives for schools. Taking over from the National-led coalition governments, the 1999-2002 and 2002-2005 Labour-led coalition governments significantly increased the number of ICT-based initiatives for schools. Labour expanded the first ICT strategy, *Interactive Education* (1998) and developed an enlarged second strategy, *Digital Horizons* (2002, updated in 2003). These initiatives connected increased the amount of government spending on ICT in schools from $5 million in 1999 to $60 million per annum in 2004.

Along with the new initiatives, the Labour-led governments oversaw a subtle but important philosophical shift in educational computing policy. Between 1999 and 2004 the technocentric and busnocratic points of view embedded in the first ICT strategy were merged with a greater emphasis on 'teaching and learning' with computers. As this chapter discuses, this emphasis on teaching and learning with computers was not a return to an earlier approach to education policy. The policy context's emphasis on teaching and learning emerged, not from a coherent philosophical position about 'education', but from constructivist theories of learning. Under such an approach, teaching and learning was its own, ill-defined moral good, variously linked to students' future in the 'knowledge economy'. The overall result saw the 1999 to 2004 ICT policy context maintain its economic imperative for computers in schools, while also enhancing its optimism, not so much around the direct potential of technology, but around the potential of 'teaching and learning' with ICT.

This chapter examines the ICT policy developments of 1999 to 2004 in relation to the 'Third Way' political approach of the New Zealand Labour party. Third Way politics has been characterised as an attempt to renew social democracy[1] and is commonly associated with Tony Blair's government in the United

[1] A. Giddens (1998). The third way: the renewal of social democracy. Cambridge: Polity Press.

Kingdom and Bill Clinton's Presidency in the United States. Between 1999 and 2004 the New Zealand Labour party also made many references to Third Way politics. Understanding the Labour government's policy approach to ICT in schools as a case study of Third Way politics provides an insight into how such a political approach can operate and, more importantly, the nature of the political decisions and support that was developed for the ICT strategies. In particular this chapter explains how a strongly economic and skill-based approach for ICT in schools was able to continue between 1999 and 2004, while also consolidating its support from educators, parents and businesses.

This chapter has three main sections. The first of these sections explores the overall political context including the shift from a National led government to a Labour-led government and the political qualities that defined the Third Way approach of Labour. The second section of this chapter considers the educational context of educational computing from 1999 to 2004. It considers including the development of the Ministry of Education and the ideological leadership role it now took in Labour's Third Way approach. This section also discusses the nature of educational computing in New Zealand schools over this period, both in terms of the number of computers in schools and the limited success of these computers in generating the learning outcomes expected by an optimistic policy context. The final section of this chapter explores the structure and ideology of the ICT strategies. It links the earlier discussions of this chapter into a critical consideration of the content of these strategies and the way in which they built a Third Way consensus with parents, schools and businesses. This section includes a close examination of three particular initiatives of this time: the professional development clusters, the E-learning fellow and the Digital Opportunities Projects.

The political context 1999 to 2004

From National's Nick Smith to Labour's Trevor Mallard

Nick Smith took over from Wyatt Creech as the Minister of Education in January 1999. Throughout 1999 Nick Smith was involved in launching a number of initiatives connected with the ICT strategy. In April 1999 Cabinet

agreed to an additional $25 million over three years to primarily support schools ICT planning and internet connections.[2] Based on both this decision, and his public comments, Nick Smith was very supportive of the ICT strategy and keen to progress ICT in schools. In his first major speech as Education Minister he noted that literacy and ICT were, in that order, his two most important areas of focus:

> My second priority is information technology and making sure we equip our young people for the information age. The pace of change is awesome and our schools are not keeping up. Information technology is no longer an optional add-on to the curriculum.[3]

Nick Smith did not have a great deal of opportunity to develop his interests as Minister. After the counting had finished for the November 27 election 1999, the Labour and Alliance parties, backed with a confidence and supply agreement from the Green party, held a majority in parliament. Trevor Mallard became the Minister of Education in the new government. Under Trevor Mallard there was no change in Ministerial enthusiasm for ICT in schools, and if anything, this enthusiasm increased along with the large number of ICT initiatives. For instance, by June 2000 Trevor Mallard announced a further $18.1 million over four years to develop the Te Kete Ipurangi (TKI) website, a help desk and an additional 25 professional development clusters.[4] In July 2000 he also announced a $10,000 pilot for the Computers in homes initiative. The Computers in homes initiative was noteworthy in that it was an endorsement of the previous administration's links between the economy, ICT and education. The initiative was designed to support poorer families in low decile education areas by 'bridging the digital divide' and developing marketable skills within poorer families:

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[2] See Cab (99) M 10/6

[3] N. Smith (1999). *Literacy and IT focus for new Minister.* Press release 24 March 1999 as sourced 14 November 2005 from http://www.executive.govt.nz/speech.cfm?speechralph=27483&SR=0

[4] T. Mallard (2000a). *Budget boost for ICT.* Press release 26 June 2000, as sourced 14 November 2005 from http://www.beehive.govt.nz/ViewDocument.aspx?DocumentID=7783

> If left unchecked, the digital divide has the potential to damage opportunities for individuals, communities and the ability for all New Zealanders to participate in the knowledge economy[5]

Trevor Mallard was maintained as the Minister of Education throughout the period examined by this chapter, including the election of a second Labour-led coalition in 2002. Part of the reason for Labour's continued electoral success was connected to the performance of the economy, including the government's own fiscal position. Throughout this period there were high government surpluses;[6] 20% economic growth overall;[7] low inflation; moderate interest rates;[8] record low unemployment[9] and endorsements from such agencies as Moodys[10], Standards & Poors[11], and the OECD.[12] On the less positive side, there was concern at the high dollar and trade deficits. Critics also pointed to the government's 'luck' in being in office during a time when the economy was highly performing.[13] Overall though, the government had ample resources, and ample public support, to progress its policy programme – including the ICT strategies.

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[5] T. Mallard (2000b).*Government support for Computers in Homes project.* Press release 7 July 2000, as sourced 14 November 2005 from http://www.beehive.govt.nz/ViewDocument.cfm?DocumentID=7889; see also http://www.computersinhomes.org.nz/index.htm

[6] M. Cullen (2004a). *Fiscal economic performance good but care needed.* Press release 14 December 2004, as sourced 14 November 2005 from http://www.beehive.govt.nz/ViewDocument.cfm?DocumentID=21824

[7] M. Cullen (2004b). *Economy grows almost 20 per cent in 5 years.* Press release 22 December 2004, as sourced 14 November 2005 from http://www.beehive.govt.nz/ViewDocument.cfm?DocumentID=21911

[8] M. Cullen (2004a)

[9] M. Cullen (2005a). *Speech to Auckland Chamber of Commerce*. Press release 23 February 2005, as sourced 14 November 2005 from http://www.beehive.govt.nz/ViewDocument.cfm?DocumentID=22264

[10] M. Cullen (2004c).*Cullen welcomes Moody's report*. Press release 1 December 2004, as sourced 14 November 2005 from http://www.beehive.govt.nz/ViewDocument.cfm?DocumentID=21670

[11] M. Cullen (2004d). Standard & Poor's report remains positive. Press release 8 September 2004, as sourced 14 November 2004 from http://www.beehive.govt.nz/ViewDocument.cfm?DocumentID=20840

[12] M. Cullen (2005b). Economic report shows heading in right direction. press release, 2 February 2005, as sourced 14 November 2005 from http://www.beehive.govt.nz/ViewDocument.cfm?DocumentID=22096

[13] New Zealand business roundtable (2004). *Government Must Acknowledge Failed Policies.* Press release 11 February 2004, as sourced 14 November 2005 from http://www.nzbr.org.nz/documents/releases/releases-2004/040211BPS.htm

Third way politics and New Zealand's Labour party

The Labour party's approach to government has become known as the Third Way. Third Way politics can be seen as an attempt to move away from the extreme forms of economic rationalism, as seen in New Zealand politics in late 1980s and 1990s, and the interventionist welfare-state politics of Robert Muldoon.[14] The move away from these extremes has also involved governments taking a more strategic and pragmatic approach to policy. New Zealand's Labour party drew on lessons from the Third Way approaches of Tony Blair and Bill Clinton. The governments of Blair and Clinton sought an improved approach to social democracy, while also maintaining the neo-liberal economic framework of market forces. In New Zealand this also extended to a commitment to free-trade and the economic potential of globalisation. In Prime Minister Helen Clark's words:

> How to adapt to globalisation and the new technologies are issues pre-occupying all nations. Ours is a Third Way approach to dealing with them. We know the potential of dynamic markets to create wealth. We know too the necessity of social investment to spread opportunity and access to a good life and guarantee fairness and security.[15]

This statement succinctly captures the aim of Third Way politics in New Zealand, as well as its deeper contradictions. As has been evidenced in the New Zealand economic 'experiment' of the 1980s and 1990s, the operation of market forces can exacerbate inequalities and result in deleterious social effects.[16] Mediating the 'dynamism', created by global competition and enterprise, while also supporting the social fabric is an exercise, not just in balance, but in managing what are potentially quite contradictory political forces.

The Third Way approach has had its share of critics. On the left, it has been argued that neo-liberal or market-oriented economic and social policy structures have remained in place and overwhelmed governmental attempts at social and

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[14] A. Giddens (1998)

[15] H.Clark (2000). *Address to Labour Party Conference 2000.* 18 November 2000, as sourced 24 February, 2005 from http://www.beehive.govt.nz/ViewDocument.cfm?DocumentID=9091; see also S. Maharey (2003). *The Third Way and how I got on to it.* 3 June 2003, as sourced 14 November 2005 from http://www.beehive.govt.nz/ViewDocument.cfm?DocumentID=16977

[16] J. Kelsey (1997). The New Zealand Experiment: A world model for structural adjustment? Auckland: Auckland University Press.

democratic reform. As these critics have argued, Third Way politics essentially enshrines the inequalities of the market while also providing, at best, a legitimising programme of social policy.[17] In New Zealand, such criticism is at its most vociferous in the Alliance political party website:

> The Third Way is the politics of manipulation and defeatism. Not the politics of hope and solidarity.[18]

On New Zealand's political right, there has also been outright dismissal of Third Way politics. Those on the right often criticise the Third Way because of its perceived reinstatement of familiar leftist politics. Such a point of view is observed here from Bruce Logan[19] of the Maxim Institute:

> The Third Way is an attempt to renew centre-left politics. It has neither a coherent history nor philosophy. It is the left being pragmatic. It proposes a political programme that goes beyond the old left, which failed because of the collapse of communism. Third Wayers claim that the "New Right", (hardly new anymore), has failed because of its emphasis on individualism, neglect of the community, insecurity of employment and its unwillingness to invest in public services.[20]

British academic Anthony Giddens has been at the centre of international debates about the Third Way. Giddens has championed a Third Way approach, prefaced on not returning to the leftist policies of previous administrations, nor the doctrinaire neo-liberalism, that in the United Kingdom at least, was introduced by Margaret Thatcher and John Major. Giddens approach could be considered as a something of pragmatic approach favouring neither extreme – but he himself sees this alternative as a potentially new approach to social democracy – just as social democracy was forged, in the 1930s, as a radical departure from socialism.

> I propose to turn the arguments of the critics on their head. Third way politics – modernizing social democracy – can develop a political programme that is integrated and robust. Far from displacing social

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[17] For example S. Power and G. Whitty (1999). New Labour's education policy: first, second or Third Way? *Journal of Education Policy*, 14 (5) pp535- 546

[18] L. Harre (2003). The Third Way: Politics of Manipulation and Defeatism Speech to Alliance Annual Conference 2003, February 24 3003, as sourced 26 February 2005 from http://www.alliance.org.nz/info.php3?Type=Columns&ID=1741

[19] Assuming Bruce Logan did not copy this point of view from elsewhere.

[20] Maxim institute (2004). As sourced 11 November 2005 from http://www.maxim.org.nz/main_pages/news_page/news_pressthirdway.html

> justice and solidarity, Third Way politics... represents the only effective means of pursuing these ideals today.[21]

Unfortunately there is not scope here to fully explore Third Way politics. Moreover it is unlikely that a definitive position on the merits or otherwise of the Third Way debate undertaken here. What can be achieved is an exploration of the potential for contradictions in the Third Way in relation to the New Zealand educational policy context and the ICT strategies for schools. Within a Third Way framework the ICT strategies rest upon two forces: the enshrinement of an economic consideration to the use of ICT in schools and the development of greater support from within the education community itself for the use of ICT in education. As the following section sets out, from this perspective the Labour-led coalitions have arguably operated in a successful manner: educationalists have tended to support the government's approach to ICT policy for schools and the government has enshrined a busnocratic focus for ICT in schools.

Third Way politics the knowledge economy, education and ICT

An important theme in the Labour government's policy approach has been importance of the 'knowledge economy' or 'knowledge society. Neither term has been well defined, but they are often linked to a movement away from the traditional mechanical and industrial nature of the economy towards the new types of information technologies and new forms of innovation. For instance:

> All this work confirms the need to continue to transform the New Zealand economy. We need to become a more innovative, more confident, more flexible economy which is able to compete successfully on the international scene.[22]

And

> In practical terms, we need to be commercialising more of our new ideas than we manage at present, ensuring that we have the highly educated population and the technology to realise our innovation vision.[23]

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[21] A. Giddens (2000). *The third way and its critics.* Malden, Mass: Polity Press pp29

[22] New Zealand government (2002). *Growing an innovative New Zealand.* As sourced 11 November 2004 from http://www.executive.govt.nz/minister/clark/innovate/innovative.pdf

[23] H. Clark (2001). *Prime Minister launches Knowledge Wave project.* Press release 16 February 2001, as sourced 11 November 2005 from http://www.beehive.govt.nz/ViewDocument.cfm?DocumentID=9614

There are many other possible examples of the Labour government's position on to the knowledge economy. Arguably more important than the specifics of Labour's approach to the knowledge economy is the way in which its political approach has been successful at building consensus about the importance of the knowledge economy across various business, education, social and environmental groups. The government involvement in the two 'knowledge wave' conferences, in 2001 and 2003, set the tone for such consensus. These conferences provide an excellent example of how Third Way policy rhetoric can, not only minimise the differences in disparate points of view, but actually unite them. Observe the following statement from Prime Minister Helen Clark:

> In general the conference appears to agree that governments in the twenty-first century have to be smart and active. They have to work strategically. Macro-economic policy alone is not enough.
>
> ...That is about making the economic, the social, and the environmental work together for successful outcomes. I do think that being environmentally sound and socially responsible adds to economic strength.[24]

Particular concepts of technology and 'technologised globalisation' underpin the consensus sought after in this statement by the Prime Minister. The importance of technology for this position is in the role it plays in facilitating innovation and economic growth. Technology is assumed to be a neutral tool and is not problematised in terms of its role in degrading the environment and increasing the power of certain wealthy corporations. Technology is seen as an economic opportunity much more than a complex social development. This understanding of technology is linked to linear and modernist ideas about progress, namely that new technology and global access equals societal improvement.

> For New Zealand, globalisation is a given. Our history, our culture, and our ongoing prosperity are about taking the opportunities globalisation offers us and applying them for our common good. We need markets offshore to sell our goods and services; we need capital from offshore to invest in our future; and we are involved continually in a dialogue of

[24] H. Clark (2001). *Closing address to Knowledge Wave conference*. 3 August 2001. As sourced 14 November 2005 from http://www.beehive.govt.nz/ViewDocument.cfm?DocumentID=13267

> ideas at these and other forums in every walk of life with the rest of the world.[25]

And

> Information and communications technology helps drive the modernisation of the entire economic and social infrastructure... .[26]

There is an optimism in this approach to technology. The government discourse regarding e-government also reflects this optimism for information technology.

> E-government is a way for governments to use the new technologies to provide people with more convenient access to government information and services, to improve the quality of the services and to provide greater opportunities to participate in our democratic institutions and processes. E-government presents New Zealand with some tremendous opportunities to move forward in the 21st century with higher quality, cost-effective, government services and a better relationship between New Zealanders and their government.[27]

This optimism seems misplaced given the number of government I(C)T projects that failed during the 1990s.[28] From a critical perspective one could therefore have expected a more cautious approach from the government towards ICT given the failure of such projects and to emphasise that the reality of ICT.

From its position on ICT and the knowledge economy, it was a short step for the government to link the education system into its discussion. By 1999 the strong links between education policy and economic policy were commonly accepted and it was a straight forward process to then link the knowledge economy, ICT and education policy. As Trevor Mallard is reported as saying at the launch of the education website Think.com:

> Mr Mallard says that Think.com also links to the government's vision of enabling all students, irrespective of their backgrounds, to develop the

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[25] H. Clark (2001). New Century, New Economy: PM's speech to APEC CEOs in Shanghai. 19 October 2001. As sourced 14 November 2005 from http://www.beehive.govt.nz/ViewDocument.cfm?DocumentID=12132

[26] H. Clark (2001).Prime Minister's Address to the London School of Economics. 21 February 2002. As sourced 14 November 2005 from http://www.beehive.govt.nz/ViewDocument.cfm?DocumentID=13082

[27] New Zealand government (2001). *E-government - A Vision for New Zealanders.* As sourced 14 November 2001 from http://www.e-government.govt.nz/programme/vision.asp

[28] T. Mallard (2001). *Government monitoring of major IT projects.* Press release 11 April 2001, as sourced 14 November 2001 from http://www.beehive.govt.nz/ViewDocument.cfm?DocumentID=10243

> knowledge, understandings, skills and attitudes to participate and succeed in our information-rich global economy.[29]

And as can be observed in a government protocol statement for the Digital Opportunities projects:

> Our education system offers us a starting point for working in partnership. It is an environment in which we can help prepare young New Zealanders to contribute to growing and sustaining a knowledge economy. Through education we believe we can start to break down those barriers to innovation and improve learning outcomes.
>
> With this in mind, government and businesses are working together to address some of the barriers to ICT use, focusing on schools.[30]

From a Third Way perspective, such statements supported a broad consensus concerning the nature of ICT policy for schools. Between 1999 and 2004 business interests, schools, parents and teacher unions have tended to endorse, or at least acquiesce to, the government's ICT policy for schools. Evidence for this general agreement can be seen in the Ministry of Education's analysis of submissions on the draft ICT strategy for schools 2002-2004. The general tone of the 52 submissions was positive although, in some cases, it also suggested that the government extend various aspects.[31]

A high number of ICT businesses also supported the government's position on ICT in schools. This support came through the sponsorship of conferences, and their participation in the government initiatives to improve the amount of ICT in schools, including the laptops for teachers deals, the extension of broadband and the software licensing deals. Telecom, Apple Computers, Microsoft are just some of the telecommunications and computing corporations that provided support to the government with running conferences such as the ones for NavCon and for those schools in the government funded professional development clusters.

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[29] Think.com (2001). *Ministry of Education empowers New Zealand schools with the help of Oracle's Think.com.* As sourced 14 November 2005 from http://www.think.com/en_us/about/news/01_Oct_NZ.shtml

[30] New Zealand government (2001) *The Digital Opportunities Partnership Protocol. A government - business partnership agreement.* As sourced 14 November 2005 from http://www.executive.govt.nz/minister/mallard/digital/protocol.htm

[31] Ministry of Education (2001). Analysis of submissions received on the draft Information and Communication Technologies (ICT) strategy for schools 2002-2004. Ministry of Education

Teachers and schools have supported the government's position too. In addition to the generally supportive submissions made to regarding the second ICT strategy, schools and teachers participated in a large number of ICT professional development initiatives. This included the ICT lead school clusters, the ITPD projects and the various ICT-education conferences between 1999 and 2004.[32] Furthermore, the submissions to the second ICT strategy produced by both the teacher unions, the New Zealand Educational Institute (NZEI) and New Zealand Post Primary Teacher's Association (NZPPTA), reveal relatively mechanical concerns with the ICT policy of government and do not substantively question the intent, ideology and rationale of the ICT strategies.[33]

Parents, through the New Zealand School Trustees Association, also endorsed and encouraged the government's position on both the knowledge economy and ICT policy.[34] In the March 2002 issue of STAnews underlines the importance of the 'knowledge wave' and economic growth, while also suggesting that the government make education for economic growth an even higher priority.

> New Zealand will never achieve the economic growth envisioned by the Government unless money is invested and a greater priority given to education.[35]

Educational context 1999-2004

The evolving role of the Ministry of Education

Between 1999 and 2004 the Ministry of Education continued to develop an active and strategic role in the education sector. The concept of a small, policy Ministry was a distant starting point as the Ministry developed initiatives which included: intervention and support processes for struggling schools, a suspension-reduction programme, the network reviews (a process which

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[32] J. Gerritsen (1999). The ICT strategy one year on. *Education Gazette* 78 (16). As sourced 14 November 2005 from http://www.edgazette.govt.nz/articles.php?action=view&id=5437

[33] See for instance Report to annual meeting 2002 ICT provisions in schools and early childhood centres NZEI (2002).

[34] STAnews (2002). Innovation, knowledge wave, economic growth – implications for the education sector. March 2002; STAnews (1999). The verdict on education budget "useful" rather than spectacular. June 1999

[35] STAnews (2002). Economic success stands and falls on education. March 2002

rationalised school numbers in certain regions), the schooling strategy,[36] systems for ensuring that all schools developed planning and reporting processes which documented their efforts to improve student achievement[37] and the development of the Best Evidence Syntheses.[38]

A closer examination of the Best Evidence Syntheses provides an insight into both the Ministry's growing role and this projects ramifications for ICT in schools. The Best Evidence Synthesis (BES) publications represent a sophisticated set of literature analyses related directly or indirectly to quality teaching and improving student achievement. According to the Ministry of Education the role of these documents has been to:

> ...draw together the available evidence about what works to improve education outcomes, and what can make a bigger difference for the education of all our children and young people[39]

In relation to the role of the Ministry of Education, the BES work shows a level of pedagogical leadership far ahead of anything envisioned in the initial years of *Tomorrow's Schools* policy. Since 1989 the Ministry had been involved in administrative, curricula and assessment reforms in the education system. The Best Evidence Syntheses represent a logical extension of this process in that there focus on pedagogy and classroom performance, represents the next big step towards in directly leading and improving the work of schools.

> In recent years we have been extending our range of activities and the nature of our role has been changing.
>
> This overall shift sees the Ministry moving to play a greater role in building the knowledge-base and capability of the sector at a system, institutional and individual teacher/student level.[40]

The BES work therefore provides an insight into the policy context's focus on 'teaching and learning'. As this chapter discusses this focus on 'teaching and

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[36] See www.minedu.govt.nz for details of these projects

[37] Ministry of Education (2001). *Circular 2001/22 - Education Standards Act 2001*. As sourced 14 December 2005 from http://www.minedu.govt.nz/index.cfm?layout=document &documentid=6426&indexid=1042&indexparentid=1108

[38] Ministry of Education (2002). *Best Evidence Synthesis*. As sourced 14 December 2005 from http://www.minedu.govt.nz/index.cfm?layout=document&documentid=8646&data=l

[39] Ibid

[40] Ministry of Education (2003). *Statement of Intent 2003-2008*. pp14

learning' does not draw upon an explicit ethical framework for what constitutes 'education'. Learner outcomes are valued, and evidence is well presented on how learner outcomes can be improved, but there is not a clear sense of what these outcomes should be. Somewhat pragmatically, the guidelines to creating a BES document outline a 'what works' approach to learners outcomes:

> The primary purpose of best evidence synthesis iterations is to systematically identify and bring together, evaluate, analyze, synthesise, and make accessible, relevant evidence linked to a range of learner outcomes in a timely manner...[41]

In general, the sophistication of the BES research and analysis prevents it from being characterised as a simplistic project. The BES work does however provide a key case study for understanding the policy context's focus on teaching and learning at the expense of a sociological, philosophical or values-driven approach to education. In this sense the work of the BES does not openly question the policy context's busnocratic demands for education and prefers to focus on how the education system is to deliver 'positive outcomes'.

The BES work around ICT provides an example of this approach. For instance the BES publication *Quality Teaching for Diverse Students* provides a naïve endorsement of computers in schools, albeit one hedged within the importance of quality teaching. With reference to reports by the British Educational Communications and Technology Agency (BECTA) and the U.S. Department of Education, *Quality Teaching for Diverse Students* makes an optimistic claim, about computers in schools, one that is very much in line with the optimism of the wider policy context:

> These large studies appear to be capturing a very recent change whereby computers are becoming more effective, integrated into, and aligned with, pedagogical practice.[42]

The claim is optimistic in that it draws upon the work of agencies that are likely to have been influenced by the considerable public spending of their

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[41] Ministry of Education (2004). *Guidelines for generating a Best Evidence Synthesis.* As sourced 14 December 2005 from http://www.minedu.govt.nz/index.cfm?layout=document &documentid=8646&data=l

[42] Ministry of Education (2002). *Quality Teaching for Diverse Students*. Ministry of Education pp 77

governments in educational ICT. Also, in the case of BECTA, its role is actually to develop the use of ICT in British education. An examination of its goals and functions suggest that it might be compared to an agency equivalent of the ITAG education sub-committee.[43]

Additionally the BES also fails to take into account the readily available alternative points of view about computers and learning. As an example of a recent piece of research, the Royal Economic Society found, in a 2004 study of 100,000 pupils in 31 countries, that when family circumstances are controlled for, computers have a slightly negative impact on learning.[44]

ICT and schools 1999-2004

The number of computers in schools continued to rise between 1999 and 2004. In 1999 the ratio of pupils per computer had reached 11 students per computer in primary and 6 in secondary. By 2003 the ratios were as low as 7 students per computer in primary and only 4 students in secondary. The rate of internet access had reached approximately 100% in 2001, with indications being that student and teacher internet usage was increasing over this period too. Just over half of secondary schools were using broadband internet services at this point and approximately and third of primary schools. In 2001 the Treasury used such numbers to state that New Zealand schools were among the most ICT-intensive in the world. Treasury also cited an OECD source in stating that New Zealand was the only country in the OECD "where over 90% of teachers have had some training in ICT".[45]

The high number of computers in schools and the extent to which teachers were trained did not appear to improving the academic success of students. In June 2000 ERO stated that:

> Many schools are unable to point to specific improvements in teaching and learning that have been brought about through the use of ICT. The

[43] http://www.becta.org.uk/
[44] The register (2005). *How computers make our kids dumber*. As sourced 14 December 2005 from http://www.theregister.co.uk/2005/03/21/how_dumb_kids/ and T. Fuchs (2004). *Computers and student learning*. As sourced 14 December 2005 from http://www.res.org.uk/econometrics/504.pdf
[45] Treasury (2001). Internal discussion document.

> improvements mentioned most are those directly related to the use of technology (such as improved standards of writing, presentation and graphics) rather than improvements in areas such as problem solving.[46]

In 2000, Web research's analysis of Information Technology in schools[47] also suggested that computers had yet to contribute to improved student outcomes.

> Information and Communications Technology is widespread... in New Zealand schools, but the uses to which it is being applied to date do not exploit its powerful potential to anything near the full. The most common areas of use are purely in the areas of providing students with technical familiarity and basic functional skills...[48]

In 2002, an optimistic evaluation of the progress of the 23 cluster schools, developed under the first ICT strategy, suggested that lower forms of cognitive skills were more likely to observed over higher level learning outcomes and cognitive skills in classrooms using computers.[49]

In 2004, Lorrae Ward, Viviane Robinson and Judy Parr found that:

> While educational policy internationally emphasises the use of information and communication technologies (ICT) as a means of meeting the needs of the 21st century, the reality appears to be that there is little integration into classroom practices...[50]

In a second 2004 article, Lorrae Ward, Judy Parr and Viviane Robinson also found that computers were underused in New Zealand secondary schools. Their study is of particular note in that they examined four technology-rich New Zealand secondary schools with good levels of professional development and support.

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[46] Education review Office (2000). *The Implementation of Information and Communication Technologies (ICT) in New Zealand Schools.* As sourced 18 June 2006 from http://www.ero.govt.nz/ero/publishing.nsf/Content/Reports%20-%20National%20Reports#2000

[47] P. Capper, L. Bowen-Clewley and B. Harris (2000). *Managing information and communications technology in schools*. Wellington: Centre for Research on Work, Education and Business Ltd. (Final working draft 12).

[48] Ibid pp3

[49] V. Ham, Gilmore, A., A. Kachelhoffer, D. Morrow, P. Moeau, and D. Wenmoth (2002). *What makes for effective teacher professional development?* Christchurch College of Education.

[50] L. Ward, V. Robinson, J. Parr (2005). Getting ICT into classrooms: the case for broader swamps in the future. *Computers in New Zealand Schools*, Jul 2005 17 (2) pp23-29

> Similarly, teaching practices and classroom activities seem to have remained predominantly teacher-directed and there is little evidence of a widespread change to more student-centred practices.[51]

Generally information that questioned the optimistic ICT policy paradigm was given a relatively small amount of critical attention at any of the several ICT-company backed conferences that were open to schools during this period. Compaq, TUANZ and NavCon were among the significant annual conferences from 1999 to 2004. Hundreds of educators attended each of these conferences to understand in more detail education through and with computers. Between 1999 and 2004 much of the focus for these conferences was on the importance of particular models of teaching and learning with computers, alongside eager technology companies keen to support school-wide purchases of equipment.

> Compaq is committed to enabling more New Zealand students access to technology in order to develop and succeed in a global economy.[52]

In particular, a constructivist bias is evident in the ideology of these conferences. As Brown has noted the NavCon 2002 website defined effective teaching and learning within an exclusively constructivist approach:

> The design and construction of effective, technology-rich learning environments requires a sound pedagogical framework that is constructivist and is mediated by a teacher who is equipped with clearly defined learning outcomes.[53]

The exact form of constructivism referred to here is unclear. However, an examination of the conference presentations suggests that NavCon 2002's constructivism emphasises thinking skills, authentic contexts for learning, problem solving and curriculum integration.[54] Like the work of the Best Evidence Synthesis, when at its best, the broad version of constructivism pointed to by many of the conference speakers provides a persuasive

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[51] Ibid

[52] Compaq (2001). *E-Learning The Focus For 2001 Compaq Great Discoveries Education Conference*. As sourced 14 December 2005 from http://www.hp.co.nz/newsroom /article.asp?Q_ArticleID=28&Q_AreaID=1

[53] M.E. Brown (2000). Guest editorial learning in the 21st Century: Being Critical, going deeper and thinking smarter. *Computers in New Zealand schools* 12 (3) pp3-7.

[54] See for instance D. Stanley (2002). *Keynote address to NavCon 2002: Learning on planet nearth: constructivism in cyberspace*. As sourced 19 June 2006 from http://www.lea.co.nz/ict/eResources/news.asp

presentation of learning theory. What is important to note however is the bias towards educational psychology as a means of developing 'pedagogy'.[55] This bias also favours such vague concepts as '21st century education' and the 'future of learning'. What is not addressed is the broader philosophical or ethical issues linked to the economic focus for education systems and technology.

It is also important to note the supportive role played by the Ministry of Education within such conferences. Many of the presenters and organisers of these conferences were contracted to the Ministry of Education to carry out particular ICT-based projects.[56] In this sense the focus on teaching and learning in these conferences reflects the rationales surrounding the Ministry's own work on ICT policy for schools. Conferences like NavCon 2002 have therefore operated as a zone for Third Way consensus between businesses, educators and the government.

From *Interactive Education* to *Digital Horizons*

This section does not attempt to detail and critique the variety of ICT policy initiatives developed between 1999 and 2004. There are simply too many initiatives for one chapter. What is presented here is an examination of the changes between the first and second ICT strategies, both in terms of the initiatives that broadly fall under these strategic umbrellas and also in terms of the philosophical or ideological developments between the two strategies. These philosophical shifts are characterised by three features:

- the continuation of the earlier busnocratic ideas about education;
- a softening of the traditional technocentric approach which assumed that computers are a catalyst or facilitator to improved learning outcomes;
- a shift towards a new technocentrism which assumed that computers and constructivist theories of learning would lead to improved student outcomes.

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[55] Thus suggesting a quite different understanding of pedagogy as is discussed in a text like *Pedagogy of the oppressed*

[56] For instance the NavCon conferences 2000-2004 See also http://www.core-ed.net/phpwiki/index.php/NavCon and www.navcon.org.nz

As was set out in the previous chapter, the first ICT strategy *Interactive Education* was released in October 1998 and involved $14.3 million of initiatives over 3 years. These initiatives included:

- On-line resource centre
- Promotion of a computer recycling scheme
- Financial assistance scheme
- Netday
- Professional development for planning and implementation (one day course for principals)
- Information technology professional development
- ICT professional development schools and clusters

These initiatives continued under the Labour-led coalition elected in November 1999, although, on taking office the education Minister Trevor Mallard quickly started to develop additional initiatives around Interactive Education on the way to launching a new draft strategy on 3rd July 2001. This new draft strategy was presented by the Education Minister to the Learning@school conference for the ICT cluster schools.[57] This draft strategy was somewhat larger and more detailed than the final version and, unlike the first strategy, involved the education sector in a structured consultation round. The Ministry of Education also had more autonomy over this strategy than they did the first, in that they had constructed the first draft rather than those connected with ITAG. In line with this greater 'educational' involvement it is understandable that the characterisations of the new strategy emphasise 'teaching and learning', and its important corollaries, including the professional development of teachers and principals. At the Compaq education conference in September 2001 the Minister of Education points out that the draft ICT strategy, despite a few reservations, has its focus in the right place.

> To be frank, I think the document looks a bit woolly - sort of like it had been written by a committee.
>
> But it does keep the focus where it belongs - on improving students' knowledge, understandings, skills and attitudes.
>
> The three building blocks to achieving that are:

[57] T. Mallard (2001). Speech to the Compaq education conference. 18 September 2001. As sourced 11 November 2005 from http://www.beehive.govt.nz/ViewDocument.cfm?DocumentID=11815 see also http://www.tki.org.nz/e/community/ict/

- effective learning and teaching
- efficient management and administration
- development of the infrastructure New Zealand education needs.[58]

The Minister's general acceptance of this strategy, including the emphasis placed on teaching and learning, should be seen alongside the emphasis this strategy places on the economic qualities of ICT in education. Again, at the Compaq education conference, he makes this clear:

> For the sake of our children's learning and of our future as a society - and an economy - we must keep up with the fast-moving advances in ICT.
>
> ...Above all ICT is our passport towards becoming a knowledge society...a knowledge economy.

In the slimmed down 2002 version of *Digital Horizons* both these points of view remain. The economic point of view is set out, for instance, in the 'context' section on page 3:

> To benefit from the expansion of ICT and the impact this has on our ways of living and working, we need a learning culture that recognises:
>
> • the enhanced breadth, richness and authenticity of learning that can be achieved through ICT;
>
> • the need for people to use ICT and information to fully participate in society and the workplace; and
>
> • the importance of specialist ICT skills to economic development.[59]

There is a potential contradiction in the sentence referring to specialist ICT skills and economic development. Specialist ICT skills, eg building networks, programming, computer aided design are not likely to be learnt by students using ICT 'across the curriculum'. These skills are much more likely to be learnt in dedicated courses. However, as has been the tradition in New Zealand education, specialist ICT courses are not mandated by the curriculum. Such courses would have to be resourced by the government and they also potentially

[58] T. Mallard (2001)
[59] Ministry of Education (2003) pp3

absorb a secondary school's computing resources at the expense of other curriculum areas.[60]

The teaching and learning points of view in *Digital Horizons* are summarised in the focus of the overall strategy.

> Good progress has been made through the previous strategy in developing school ICT infrastructure, capability and programmes. This strategy focuses on helping schools to extend their use of ICT to support new ways of teaching and learning.[61]

The emphasis on teaching and learning in the document is also reflected in the Ministerial foreword to *Digital Horizons*. The foreword begins in a conversational tone, linking the Minister and the ICT strategy to the work of ex-Director General of Education Clarence Beeby.

> Something of Clarence Beeby's spirit can be seen here in this strategy document. This Government has been quick to seize on the importance and practical benefits of digital technology as a key tool for 21st century learning.[62]

Given the education policy context's move away from such liberal-progressive staples as equality of opportunity and education to develop personal potential, as well as the overall busnocratic nature of this ICT strategy, it seems equally possible that Clarence Beeby's spirit may be turning in its grave. One could for instance wonder how Clarence Beeby might reconcile the concept of education to develop a 'critical conscience' with the strategy's concept of 'Digital literacy':

> Digital literacy is the ability to appreciate the potential of ICT to support innovation in industrial, business and creative processes.... Digital literacy is a 'life skill' in the same way as literacy and numeracy.[63]

The inclusion of the reference to Beeby has at least two functions. On one level it functions as a highly political move to build support for this strategy with the

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[60] In fact a group of teachers has also lobbied the government for such specialist courses to be given a higher status in the curriculum to no avail. See the website for the New Zealand Information Science Teachers http://www.nzist.org.nz/

[61] Ministry of Education (2003) pp3

[62] Ministry of Education (2003) pp2

[63] Ministry of Education (2003) pp5

education sector. This reference also represents a (Labour) government's attempt to link to the values of a previous social democratic age and re-interpret them for the 21st century. Both points of view have merit and both points of view help to explain the increasing emphasis placed on teaching and learning within the strategy.

Along with the reference to Beeby, *Digital Horizons* also moderates the technocentric language of the first ICT strategy. While *Interactive Education* suggests that ICT can:

- enable teachers to become learners as they learn to use and teach with the technologies;
- provide a platform for cross-curricula and integrated approaches to learning;
- allow access to up-to-date and appropriate resources enable interaction with peers in local, national and international networks;[64]

Digital Horizons is less direct, prepared to accept that there may be contrary points of view and ready to emphasise that it is not a direct relationship between ICT and end result. Even in this most technocentric of quotes from *Digital Horizons* the words 'facilitates' and 'encourages' are used to ameliorate the idea that ICT can achieve better learning on its own.

> ICT is arguably one of the most powerful of all educational tools.
> It creates many options and opportunities for learners. It facilitates:
>
> - diverse, motivating approaches to learning;
> - access to an ever increasing range of digital resources and online learning programmes;
> - interaction with the wider community.
>
> It encourages:
>
> - student-centred learning;
> - active, exploratory, inquiry-based learning;
> - collaborative work;
> - transfer of skills and knowledge;
> - creativity, critical thinking and informed decision making.
>
> Research into the uses of ICT in education lags behind what is actually

[64] Ministry of Education (1998) pp8

> happening in schools. Nevertheless evidence is currently emerging from studies in the UK and elsewhere that indicates improved outcomes for learners in schools where ICT is used as a tool for cognitive development in curriculum areas.[65]

In some ways, the amelioration of technocentrism in *Digital Horizons* is the result of the greater emphasis being placed on teaching and learning. For instance it is as if there has developed a greater recognition in *Digital Horizons* in the role of pedagogy, learning culture and the professional skills of teachers to deliver a classroom environment that can use computers to benefit learning. As one of the many teacher quotes included in the strategy says:

> It has made the teaching and learning so much richer and more enjoyable and interesting. It is giving teachers and students the opportunity to work in ways they couldn't before.[66]

Digital Horizons was updated in 2003. This update incorporated the new initiatives that had been developed between June 2002 and the end of 2003. Interestingly these initiatives had not been flagged in the first version of the strategy – suggesting that the strategy itself was more of a collection of initiatives linked to desired outcomes rather than an actual plan for the future. Despite this, by the end of 2003 a considerable number of initiatives had been developed by the government. From the 2003/2004 financial year onwards these initiatives were costing the government approximately $60 million per annum.[67] The following list sets out the initiatives developed under the second ICT strategy.

Programmes Addressing Access

- Improved Internet access - Project PROBE
- Educational Sector Architectural Framework
- Video Conferencing Bridge and Audio Conferencing
- Single Log-on and Authentication
- Schools' network infrastructure - Schools Network Upgrade Project
- Schools' network infrastructure - Managed Internet Services (MIS) Project
- Student Management Systems Accreditation Framework - An e-Administration Initiative

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[65] Ministry of Education (2003) pp8

[66] Ministry of Education (2003) pp15

[67] T. Mallard (2003). *Big push for ICT in schools schools to receive Microsoft software at no cost.* Press release 20 April 2004, as sourced 14 November 2005 from http://www.beehive.govt.nz/ViewDocument.aspx?DocumentID=19472.

- Learning Software
- Microsoft Software
- Antivirus Software
- Adobe Software
- Apple Software
- Laptops for teachers (TELA)
- ICT advisory service*
- ICT Helpdesk for schools*
- Recycled computers - Learning Power*
- Computers in Homes*

Programmes Improving Capability

- ICT Professional Development Clusters*
- Online ICT Professional Development Community
- E-Learning Teacher Fellowships
- Principals' laptops, web portal, and online network
- Internet/Cybersafety*

Programmes addressing Learning

- Te Kete Ipurangi - The Online Learning Centre (TKI)*
- The Le@rning Federation*
- Digital Opportunities*
- Kaupapa Ara Whakawhiti Mätauranga (KAWM)*

* Represents initiatives developed under first ICT strategy eg before June 2002 (Publication of Digital Horizons – version 1)

The nature of many of these initiatives is implied by their titles. The projects are not described fully here, but it is worthwhile pointing out that the projects developed under *Digital Horizons*, were focussed on infrastructure development and, to a lesser extent, on capability (which was supposed to be the focus of the first strategy, see above quote). Indeed many of the teaching and learning-based initiatives, including those under the capability heading, were developed, or commenced, under *Interactive Education* as represented by the asterisks.

Not that the infrastructural initiatives would be unwanted by schools or a waste of government money. Indeed most of these 'programmes addressing access' appear to have been successful in providing teachers and schools with hardware, internet access and software at a relatively low cost. Whether or not they, in turn, represent a passport to either a rosy economic future, or improved teaching and learning, is less certain. They do, nevertheless help in providing schools with the computer technology.

But beside the provision of computer technology for schools, the merits of the 'programmes addressing learning' and the 'programmes improving capability' can be questioned more fundamentally. There is not space here to go through each of these programmes but three initiatives will be discussed in some depth. The professional development clusters and e-learning fellows are discussed here in broad terms while the Digital opportunities initiative, is addressed in slightly greater depth. These discussions provide an insight into the rationales and outcomes of these projects and provide examples by which to consider the overall worth of the ICT strategies.

The professional development clusters

Many of these professional development clusters developed as part of the ICT strategies were successful in providing teachers with the skills required to use ICT within their classroom programme. An evaluation of the first 23 ICT clusters was published in 2002.[68] This evaluation was generally positive the development of teacher competence and their use of technology.[69]

It should also be noted that the evaluation of the first 23 clusters was undertaken by a number of techno-positive Christchurch College of Education staff, some of whom were closely connected to the NavCon conferences, and later to the Ultralab project (Ultralab is discussed in the following chapter). In a sense these individuals had a considerable stake in the direction already taken in both the ICT clusters and the ICT strategies and were unlikely to find critical flaws in the Ministry's approach. Given the background of these staff, it is not surprising that this evaluation was generally positive. Based on the information provided in the evaluation itself however, it is doubtful that many teachers altered their pedagogical approach following the introduction of ICT and whether students developed the higher order thinking skills often expected by the policy context.

> In terms of the Essential Skills, there was an emphasis on the middle and lower order elements of Communication Skills, Information Skills and Problem Solving Skills in students' classroom use of ICTs.[70]

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[68] Ham et al (2002)
[69] Ibid
[70] Ham et al (2002) pp10

The people who evaluated the ICT professional development clusters were also closely involved in the E-learning fellowships. At the time of writing, there were no published evaluations of this initiative but, like *Digital Horizons* itself, the 2004 fellowships represent a mix of technocentric and more pedagogically focussed pieces of research. Compare for instance the following two research questions from two different e-fellows:

> To what extent and in what ways do learners construct meaningful knowledge when using in ICT in foreign language classrooms?
>
> What makes a cluster model sustainable when the money runs out?

One of these questions belongs with the Exploratory Studies and one attempts to solve a real problem facing schools. One of these questions is likely to produce information that is already understood and one is likely to provide new information for New Zealand schools. In an overall sense therefore, although some of the e-fellow research has an interesting twist on previous forms of ICT-based educational research, it is of a questionable depth and often loaded towards a simplistic and optimistic appreciation of ICT.[71] This lack of depth is underlined by the fact that there is limited university supervision of the 'research' undertaken by the E-fellows.

The Digital Opportunities projects (Digiops)[72] are also an interesting policy development in light of the policy statements emphasising teaching and learning In some respects the Digiops projects represent a continuation of the technocentric approach to ICT from the first strategy. Indeed the overall structure of the projects is reminiscent of the rationales that structured the Exploratory Studies. In essence, these projects were little more than technology dumps with an optimism that the technology would lead to improved educational outcomes.[73] The four Digiops projects were described in the following terms:

FarNet

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[71] See the e-fellows website, as sourced 14 November 2005from http://www.core-ed.net/efellows04/index.html

[72] See the digiops website as sourced 145 November 2005 from www.digiops.org.nz/

[73] R. Stratford and M.E. Brown (2002). Towards a political understanding of New Zealand's ICT strategies. *Computers in New Zealand Schools* 14 (2) 2002 pp3-9.

An online bilingual collaborative learning and teaching resource for students and teachers based in the mid and far North.

Generation XP (GenXP)
Provided the opportunity for students in West Auckland and Gisborne schools to gain competency and NZQA credits in the Microsoft Office suite of products.

Notebook Valley
Introduced laptops as an incentive into the maths and science classes of four greater Wellington colleges with the aim of retaining students in the subjects.

WickED - The Digitally Enhanced Study Support Centre Project
Piloted in after-school homework centres in Christchurch and Invercargill, WickED was an online bilingual learning portal that aimed to facilitate technology-enhanced learning.[74]

The concept of these projects as a 'technodump' was not apparent in the initial policy discussions about these projects. At the beginning of the programme the Beehive press release began by saying this about the projects:

> Prime Minister Helen Clark and Education Minister Trevor Mallard today announced four education-based pilots to help New Zealand embrace the economic and social benefits of information technology.
>
> Helen Clark said the projects resulted from meetings between senior Government Ministers and information and communication technology business leaders which began in July last year.
>
> "We have a shared vision of New Zealand as an innovative nation leading the world using modern technology," Helen Clark said.
>
> "The potential economic and social benefits for the country are enormous"[75]

The important points to notice in this release are the links made between the Digital Opportunities projects and the economic success of the country. Notably these projects were the product of a government/business collaboration. The educational input to these projects seems to have occurred at the implementation

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[74] As sourced 14 November 2005 from http://www.digiops.org.nz/projects/pastprojects /default.htm

[75] T. Mallard (2001). *Government works with business for digital opportunities*. Press release 8 February 2001, as sourced 14 November 2005 from http://www.beehive.govt.nz/ ViewDocument.aspx?DocumentID=9550

end only. Hence, like the first ICT strategy, there is a disproportionate emphasis placed upon the knowledge and experience of those within the business sector in the development of an initiative for ICT in schools.

Once the Digital Opportunity projects had commenced, the business community celebrated their allegedly high levels of student success. In 2002, the Notebook Valley project won for the Digital Opportunities initiative the Computerworld Excellence Award for the Most Significant Contribution to IT. The Minister of Education was particularly praiseworthy of this achievement:

> "It's been wonderful to watch the success of Notebook Valley and see the difference it's making to so many young people, their schools and their communities. Now those involved in getting the project off the ground and running are being recognised for their efforts," Trevor Mallard said.[76]

Following on from this, in September 2005, the Minister himself, drew upon the evaluation reports for the Digiops projects from 2001-2004 to state that:

> "The evaluations highlight the need for grassroots school development of project ideas, to get a strong match between school priorities and the potential of information technology," Trevor Mallard said.
>
> "ICT is an incredible tool for learning and ICT skills are essential for work and for life in the modern world. The pilot projects were most successful for schools where they strengthened and extended existing school programmes, and likewise built on professional links between teachers."

This last quote is an especially selective point of view on what the evaluations say about the Digital Opportunities projects. An alternative reading of these evaluations suggests that the Digiops projects, like the Exploratory Studies of the late 1980s, suffered from an embarrassing failure to live up to expectations. Logistical, technical, personnel and pedagogical failures are evident in the evaluation summary report published within the Digiops website. The conclusions to the report do begin however, with the more positive outcomes from the project. These outcomes include the attainment of some pilot goals,

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[76] T. Mallard (2002). *Hutt Valley's digital ops project helps net top IT award.* Press release 1 July 2002, as sourced 14 November 2002 from http://www.beehive.govt.nz/ViewDocument.aspx?DocumentID=14678

raised student and teacher skill levels with ICT, changes in some teacher practices, the acceleration of school ICT planning, and improved student attitude to learning, although, as the evaluation summary report itself says:

> ...the role of technology in this improvement was not defined in the research reports. [77]

From a less positive perspective, the evaluation summary also cites as 'inhibiting factors' infrastructural incompatibility, student retention and involvement (interest), staffing and pedagogical problems, vendor-driven concerns (i.e. projects driven by the computer companies), and decile creep away from the intended lower decile schools and towards higher decile schools. Perhaps the most telling conclusion was the lack of clarity of purpose for the projects. In a telling admission the evaluation summary even cites previous research in agreeing that there was a degree of 'technodumping' in the initial Digital Opportunities projects:

> such as in the Notebook Valley experience where some teachers appear to have viewed the advent of technology as an unwanted intrusion, and, through the promotion of a range of issues and obstacles, have shown a desire to retrench to previously held practices and positions.[78]

A new round of Digiops projects commenced at the end of 2004. These projects fall outside of the scope of this thesis. On inspection many of these projects seem to make similar technocentric mistakes as the earlier initiatives.[79] Further research would be able to examine the extent to which these projects reflect the errors of the earlier Digiops projects, the E-fellows projects and the much earlier Exploratory studies.

A 2004 consensus?

At the end of 2004, the government's ICT policy position was well financed and had developed a broad set of alliances across parents, education and business groups. This policy position was however, still bound to busnocratic and

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[77] G. Falloon (2003). Summary of research findings from the digital opportunities pilots 2001-2003. As sourced 14 November 2005 from http://www.digiops.org.nz/NR/rdonlyres/450676B6-BBF6-4997-BCA3-15F9F95CF03F/0/DigitalOpportunitiesProjectsResearchSummaryAprilv4.pdf pp5

[78] Ibid pp13

[79] http://www.digiops.org.nz/projects/currentprojects/default.htm

technocentric roots. The busnocratic and technocentric optimism of the ICT strategies was reinforced with a greater emphasis on improving teaching and learning. Constructivist approaches were as well accepted by teachers and schools as was the funding directed to teacher laptops. The following section continues to explore this policy position in relation to the overall development of educational computing policy in New Zealand. It uses the themes and ideas developed in this thesis to consider alternatives to this position and to provide an analytical perspective to New Zealand's ICT policy.

Chapter Nine

Conclusion: Learning for which future?

On May 1st 2003 Ultralab South was officially opened in Christchurch. Ultralab South was created as a southern hemisphere offshoot of Professor Stephen Heppel's Ultralab at the Anglia Polytechnic University, United Kingdom. Its role was to research and develop educational technology initiatives in New Zealand schools. As the *Education Gazette* presented it:

> The idea is that Ultralab South is not some foreign invasion, but a bridgehead that will enhance New Zealand's research and knowledge base in the field of ICT in education. It will specialise in the creation of ground-breaking educational software and the application of that software for use by school children, communities and industry.[1]

Ultralab South started as a non-profit organisation, although it was set up with the assistance of the Canterbury Development Corporation (CDC) on the basis that it would enhance the Canterbury economy.[2] In the 2003 CDC annual report the presence of Ultralab South was described in the following terms:

> The Ultralab brand provides huge potential to attract significant education research contracts to the city from all around the Pacific Rim to augment the lab's leading edge New Zealand research.[3]

The staff of Ultralab South included a number of personnel who were previously linked to the Ministry of Education's ICT policy initiatives, either as employees or contractors. Ultralab South (renamed CORE in 2005[4]) have undertaken a range of contracts for the Ministry including ICT professional development for schools and coordinating the NavCon conferences. The importance of Ultralab South to the Ministry was emphasised by the Minister of Education's presence at the May 2003 opening. In his launch speech Trevor

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[1] Education Gazette (2003). Ultralab sets up in NZ *Education Gazette* 82 (9) 19 May 2003 as sourced 15 December 2005 from http://www.edgazette.govt.nz/articles.php?action=view&id=6416 12 April 2006

[2] Canterbury Development Corporation (2003). *Annual Report 2003*

[3] Ibid pp28

[4] Core Education can be found at http://www.core-ed.net:8200/

Mallard linked Ultralab South to innovation, the future and the need for education to produce skilled workers in the 21st century:

> Innovation is an area this government is spending a lot of time addressing and it is part of our vision to see all our young people better qualified than ever before…
>
> Today's students need to keep acquiring information management skills while at school to successfully take their place in the online world of the 21st century…
>
> Ultralab will become an important player in helping our network of research organisations, educational institutions and communities acquire technologies aimed at gaining knowledge, skilled workers and financing.[5]

With its significant links to the Ministry of Education, Ultralab South is a useful proxy for the dominant discourses structuring ICT policy in the final years examined by this thesis. The opening of Ultralab South, along with its own comments about educational computing, reflect a policy context that values the economic potential of technology in education and has continued the earlier optimistic beliefs about technology and schools. Aside from the comments made by the Minister of Education, Ultralab South's optimism towards technology is reflected in their mission of 'delightful learning':

> To research, apply and disseminate the benefits of new technologies, seeking to develop an empowering, creative and delightful learning environment that knows no boundaries[6]

Although this comment can not be taken as the only point of view of the Ultralab South directors, it is important to point out the emphasis in this statement is on the benefits of new technology, without reference to technology's deficiencies. It also makes a technocentric link between technological benefits and the learning environment. As has been discussed throughout this thesis this link is not linear and is dependent on 'people' aspects much more than technological aspects. Moreover in a symbolic twist, reinforcing the complex relationship between social context and technology, it is worth reflecting on a delightful learning 'blog' entry, from one of Ultralab

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[5] T. Mallard (2003). *Innovative research and development institute opens*. Press release 1 May 2003, as sourced 15 December 2005 from http://www.beehive.govt.nz/ViewDocument.cfm?DocumentID=16623

[6] http://www.core-ed.net/phpwiki/index.php/Concepts 6 April 2006

South's directors, and the subsequent response posted by an internet community member.

> **May 12, 2004**
> **delightful - what is it**
>
> a moment of gobsmacking realisation that something wonderful is possible, has happened or might occur, Delight is timeless and utterly personal, not transferable to nor understandable by others. It is your own - often misunderstood and sometimes unexplainable but when it is shared it is transformative - essence of life!!!!!
> Posted by nick at May 12, 2004 07:50 PM
>
> **Comments**
>
> 2365 check out the hot blackjack at http://www.blackjack-p.com here you can play blackjack online all you want! So everyone ~SMURKLE~
> Posted by: blackjack at August 23, 2004 02:45 AM[7]

The 2003 opening of Ultralab South is a fitting symbol for the conclusion of this thesis, especially when it is compared and contrasted with Christ's College's 1971 acquisition of the first computer by a New Zealand school. Both of these Christchurch examples reveal aspects of high finance and privilege, as observed through the anonymous benefactor of Christ's and the Canterbury Development Corporation for Ultralab South. In contrast, both these examples also reflect different approaches to the curriculum with Christ's valuing traditional, and, to a lesser extent, liberal-progressive ideals, whereas Ultralab South has favoured a psychological approach drawing upon constructivist ideas and the positive reinforcement offered through 'delightful learning'. The Christ's College example favours academic notions of learning, leading ultimately to a university education, whereas the Ultralab South prefers the development of skills and knowledge for the 21st century – a more instrumental and vocational point of view.

> Making sure young New Zealanders have the skills that equip them for life and work in the 21st century is a key education priority for our government that sits alongside our firm commitment to building an innovative and dynamic economy.
>
> That's why the government is investing heavily in ICT in education.[8]

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[7] As sourced from http://www.ultralab.org.nz/mt/nick/archives/000056.html September 11 2004

Both points of view have their strengths and weaknesses. The Christ College's approach has limited relevance to students and provides only limited opportunities to those students not on a university pathway. Ultralab South's approach assumes that technology and motivation are intertwined in a never-ending upward spiral, with new technology providing delightful opportunities to construct knowledge. In relation to the central arguments in this thesis, both examples provide this thesis with broad markers, firstly in the decline, of at least the intent, of a liberal-progressive philosophy of education, and secondly in the development of a psychological approach to schooling that is predominantly concerned with employable skills. These two examples also provide points of reference for the movement away from the computer's initial mathematical starting point in New Zealand education, to its position in 2004 - as a key aspect in the technological and constructivist development of 21st century employees.

The title of this chapter attempts to capture the contradictions and uncertainties connected with these three decades of 'change'. While the Ultralab South example potentially has the benefit of three decades of learning theory, the context for its pedagogy and curriculum, has become inter-connected with the historical processes producing stronger connections between education and economic policy. Hence, despite its technical progress it is arguably lacking in its ethical development. It is in this sense that the title question of this chapter also asks whether the ICT policy approach of the government, through such vehicles as the ICT strategies, NavCon and Ultralab South, provide a worthy enough basis for the development of citizens and communities in the future? It also considers if there are alternatives for the future of educational computing and education policy.

The main purpose of this chapter is to provide a conclusion to this thesis. This conclusion is more than a replay the previous main ideas, it uses the title question of this chapter as the basis for creatively presenting and applying the

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[8] Trevor Mallard discussing the Ultralab South coordinated, $4.02 million e-learning fellowships, 5 November 2003, as sourced 30 September 2004 from http://www.ultralab.org.nz/phpwiki/index.php/UltralabFellows

key ideas of this thesis. It begins with a summary of the previous chapters of this thesis and makes explicit links between the contents of these chapters and the questions asked at the outset of this thesis. It then provides an alternative framework for educational computing policy. This framework is designed to translate what can be learnt from this thesis, especially in relation to the development of educational policy. It does this by extrapolating the findings of this thesis into a set of principles for New Zealand's educational computing policy. These principles are intended, no so much as a comprehensive framework for future educational computing policy – but as starting point for future discussions.

A section on the directions for future research ends this thesis. Like the alternative framework for educational computing policy, this section provides a starting point for a new approach to research and educational computing policy. Like the alternative policy framework it provides this thesis with a constructive end point for discussion, one that extends from the presentation of the history of educational computing and one that extends from the critique developed throughout this text.

The thesis questions, themes, findings and the development of educational policy

The questions asked at the beginning of this thesis were:

1. What have been the New Zealand government's significant educational computing policies for schools between 1960-2004?

2. What ideologies, discourses and rationales have helped structure the New Zealand government's approach to educational computing policies between 1960-2004?

3. What, if any, are the major themes, patterns or ideas to emerge from a critical analysis of the history of the educational computing policies for New Zealand schools?

4. What can a focus on New Zealand's educational computer policies for schools tell us about the development of educational policy?

This section provides a summary of how these questions have been addressed. It refers back to the significant events discussed in each of the chapters and refers

to the key ideologies and rationales influencing government policy decisions. It also discusses the themes of this research and how they generally relate to the key policy events surrounding educational computing policy. At the end of this section, a summary is provided on what the findings of this thesis imply about educational policy development.

The chapters in 'The Next Big Thing'

Chapter One and *Two* of this thesis introduced the key policy events and the major themes used to help understand the context of New Zealand's educational computing policy. These themes have helped organise the key patterns or discourses in the context of New Zealand's educational computing policy history and they helped provide a political insight into the nature of this context. These themes were:

- the connections between economics, finance and educational computing;
- the politicisation of the future around new technology and education;
- the optimistic estimations of what new technology can contribute to education;
- the movement away from explicit philosophical, ethical or sociological approaches to education, and education with computers, and a move a psychological approach to 'teaching and learning'; and
- the paucity of critical pedagogical ideas and approaches in educational computing policy.

Chapter Three - Getting under the surface, discussed the methodological aspects of this thesis and explained the philosophical and theoretical relationship between the key themes in relation to the context, rationales, ideologies, discourses and significant policy moments. The five subsequent chronological chapters then provided a detailed discussion of the policies and discourses within the educational computing context. These chapters provided a structure for an in-depth discussion of these themes by reference to the events both directly linked to educational computing and important in the context of educational computing policy.

Chapter Four - From 'new maths' to first contact (1960-1979) and *Chapter Five - Thinking big - The consultative committee and the Poly computer (1980-1984)*, discussed the initial economic, social and policy contexts surrounding the first computers and the first major educational computing policy developments. In the 1960s and 1970s New Zealand education policy, if not practice, being consistently focussed around the relatively enlightened goals of personal development 'to the fullest extent'. Despite this dominance however, there were undoubted instrumental and 'skills-based' discourses surrounding both education and education with computers alongside such a philosophy. Interestingly, in the 1960s and 1970s, educators and policy makers could be quite restrained about the benefits that a predominantly computer programming approach could bring to the education system. As the example of Richard Spence demonstrates, concern for the liberal-progressive nature of education could be kept paramount:

> [Enlightened attitudes to education] contribute to, and derive from, a generally held belief that the purpose of New Zealand secondary education is broad personal development for effective citizenship.[9]

During the 1960s and 1970s there was only a limited political and bureaucratic interest in the use of computers in schooling. A greater political enthusiasm for computers emerged at the beginning of the 1980s, with the proliferation of micro-computers, and when Minister of Education, Merv Wellington, became involved with the development of the home-grown Poly computer. The Poly computer saga provides some of the most compelling discussion points for the themes of this thesis. The Poly project was dominated by 'export' rationales and an overtly political process. It drew upon considerable policy context optimism about, not just what the Poly could achieve in the classroom – but also in the educational computing market.

Chapter Six - The CCDU and the fourth Labour government (1984 -1990), dealt with a different set of dramas to that connected to the Poly chapter and therefore provided an additional perspective for the key themes of this thesis. The

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[9] R.J. Spence (1970). Delimiting factors in computer education at the secondary school level. *Second National Conference Proceedings Volume II*. New Zealand Computer Society (Inc.)

shortage of government funds limited the Labour party's ability to implement its own educational computing policy and it concentrated its policy efforts around the Computer Courseware Development Unit. This unit had been set up by the previous government in response to the recommendations made by the Computers in Schools consultative committee. The key piece of work carried out by this unit was the Exploratory Studies of educational computing. These studies cost the government nearly one million dollars – a relatively low amount considering the Labour party's initial promise to:

> Develop a programme for the provision of computer awareness education in primary schools; and
>
> ... ensure that every state secondary school is provided with adequate computer facilities, and support, with increasing provision for experience with other technological developments.[10]

The Exploratory Studies did not provide any especially positive evidence on which to base future educational computing policy. In part, this was because of the failure of many of these projects to demonstrate the optimistically anticipated learning benefits originally forecast. Much of the research from these projects was never published, and that which was published raised a number of concerns (at least to a critical readership) about educational computing. The Exploratory Studies did however, enable the government to manage the expectations of schools and parents for the three years the studies took to initiate and complete.

Much of the hands-on knowledge connected with the Exploratory Studies was lost to the policy context with the abolishing of the Department of Education and the development of, what was intended to be, a policy-based Ministry of Education. This change had come about, at least in part, to a much altered education policy context. The 1987 Treasury publication *Government Management Volume II: Education Issues* signalled a time when the dominant educational ideology switched from its humanitarian basis to an economic and busnocratic focus. As *Chapter Seven, Tomorrow's Schools, ITAG and the development of the first ICT strategy (1990-1998)*, sets out this change in

[10] Labour Party education policy 1984

ideology and educational administration was to have important ramifications for the development of educational computing policy in New Zealand.

Chapter Seven is the longest chapter of this thesis and is split into two. The first part of this chapter set out a number of important contextual issues connected with the education policy context. These issues revolve around the shortage of funds faced by the National government of the early and mid 1990s as a factor in the subsequent lack of any substantial Information technology policy for schools at the time. A number of other factors were important in the eventual development of the first ICT strategy for schools. This included the significant input provided by the business context through Maurice Williamson, the Minister of Information Technology's Information Technology Advisory Group (ITAG).

At $14.3 million over three years, *Interactive Education* was not an expensive policy compared to some of the potential proposals involving IT in schools. It did however provide a platform for further government spending on computers in schools. By 1999 the Labour government was in power, and with an improved economic situation, considerably extended the amount of funding which went into ICT for schools. From a 1999 position of $5 million per annum the 2004 position saw $60 million invested into the initiatives connected with the second ICT strategy for schools *Digital Horizons*. Labour, and especially the Education Minister Trevor Mallard, upheld the economic or busnocratic rationales for computers in schools that had developed throughout the 1990s, and also oversaw the increase in rationales related to 'teaching and learning' with computers. The optimism towards what computers could achieve in education did not subside with these developments. Indeed the earlier technocentric approach to educational improvement blended with teaching and learning to create a slightly more plausible form of optimism. Overall however, the driving political rationales had not substantively altered and ICT was seen as a key part of innovative teaching and learning for a future which revolved around the development of a 21st century workforce.

The development of educational policy

While each chapter of this thesis has offered an insight into the development of educational policy, it is useful at this point to provide an overview of what this thesis has demonstrated about educational policy development. In an overall sense, this historical analysis has provided an interesting case study of educational policy development. As was described in the initial chapters, the process for constructing policy can be imagined as a discursive battleground. This history of New Zealand's educational computing policy reflects a battle inasmuch as certain points of views have had more success than others in the influence and construction of the dominant policy points of view on educational technologies. Whilst these discourses have altered, ebbed and flowed in different degrees, and in a complex manner, they have, nevertheless, competed, combined and dynamically worked together (and against one another) to construct the policy points of view. At different times since 1960 quite different political points of view have shifted and competed for position in the decision making processes. For instance, the approach of the Currie Commission and the Education Development Conference jostled with the 'back to basics' ideas of parents and employers. It also faced-off against the commercial imperatives of the Poly and Merv Wellington in the early 1980s. Russell Marshall's rejuvenated liberal-progressive curriculum review was also overtaken by the new right and neo-liberalism of Treasury. Importantly such contests were not simply about different policy points of view being replaced, but they show, at a particular time, which discourse or discourses have had ascendency.

An important example of this ideological exchange is seen in the way instrumental approaches to education and educational with computers has shifted over time. This thesis supports those points of view that see the development of as neo-liberalism being based, not just in the Treasury's actions of the 1980s onwards, but in the existence of in a much more fundamental and enduring approach to New Zealand education. As Openshaw has noted instrumental approaches to education policy go back way before 1987 and,

albeit not in a hegemonic manner, are reflected in many of statements in and around education policy in the 1960s and 1970s.[11]

This thesis has also provided an insight into the ways in which the state has (dynamically) sought to develop its own legitimacy in educational computing policy. One of the theoretical positions drawn upon by this thesis includes the concept that the role of the State. The complexity and dilemmas in this role are captured in the following position statements:

- State support of the capital accumulation process;
- the State guaranteeing the context for its continued expansion; and
- the legitimisation of the capitalist mode of production, including the State's own part of in it.[12]

In attempting to legitimise its role, the State has had to build consensus, or at least find a successful equilibrium, for both its educational policies and educational computing policies. As the discussion about discourse above has implied, this has been a dynamic process. In essence successive governments have been at the policy centre of a range of powerful forces. Educational philosophies, economic structures and ideologies, technological change, globalisation effects, social pressures and, in many cases, a lack of suitable evidence for the success of computers as an educational innovation, have contributed to this dynamic. In many cases the successful, or most powerful ideas, to surface have not necessarily been the most enlightened. As a result, educational computing policy is, arguably, more lacking of a sense of 'education' in 2004, than it seems to have had in 1971.

This is not to suggest that have not been points of resistance in the overall dynamic of educational computing policy. Educational points of view are wide-ranging and many educators have found themselves finding their own way in educational computing practice, despite the policy context. In this sense, it is interesting that, internationally at least, there has grown some degree of

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[11] R. Openshaw (2003). Preparing for Picot: Revisiting the "Neoliberal" Educational Reforms *New Zealand Journal of Educational Studies* 2003 no 2

[12] R. Dale (1989). *The state and education policy*. Milton Keynes; Philadelphia: Open University Press

backlash to the use of computers in schools and early childhood centres.[13] Many conservative voices have even moved away from the dogmatic insistence on new technology to be concerned with the outcomes and problems of education with computer technology. In New Zealand, how any backlash may manifest itself can not readily be anticipated. Potential backlashes and alternative points of view are already present, at least in certain pockets and footholds, and how these develop may depend on contextual developments that question, or support, economic, educational and technological tenets of the status quo.

An alternative approach to educational computing policy

In developing a constructive starting point for future educational computing policy, this conclusion has developed an alternative approach to educational computing policy. This alternative approach is based on the findings of this research and extrapolates from the ideas, themes and events of New Zealand's educational computing policy history to produce a potentially competing way of constructing educational computing policy in New Zealand. Such an approach is not designed as an exhaustive policy answer to educational computing in New Zealand, although it is designed to start the conversation. As such, it leaves room for those willing to use this historical analysis, in combination with other ideas and approaches, to improve educational computing policy.

It is important to note that this alternative approach is explicitly political. In many ways it sets out an alternative set of ethics to educational computing policy. New Zealand's educational computing policy has been based around certain competing political ideologies and ideas: predominantly liberal-progressive and busnocratic in their orientation. In this sense the components of this alternative approach are a response to this set of views and, in some ways, can be considered as activist or controversial in its attempt to reconsider and inform the current policy trajectory. As the title of this chapter has implied, this conclusion is designed to provide critical space to consider both educational computing policy and the big questions that face an increasingly technological

[13] For example A. Armstrong and C. Casement (2000). *The child and the machine: how computers put our children's education at risk*. Beltsville, MD: Robins Lane Press

world. What future is 'teaching and learning with computers' preparing us for? What is the role of new technology in future education policy? What is the role of education in a world dominated by economic ideas and aspirations?

The key components of this alternative framework are based around sociological, technological, pedagogical and policy aspects of educational computing and/or ICT. In this way they imply wholesale changes to important paradigms within education policy. The elements of this alternative approach are:

- a critical understanding of the future with reference to the global and political context surrounding technology and education;
- a reconsideration of the aims and processes of education and schooling, with greater emphasis on personal development and citizenry rather than employability and economic growth;
- an explicit recognition of the political and non-neutral qualities of computer technology;
- a greater understanding of the relationship between the social context and educational technology; and
- a more considered understanding of the abilities and limitations of computers to bring about educational improvement.

Each of these aspects is expanded on below. This discussion demonstrates the overlapping and complementary relationship these ideas have to one another. A short discussion on the practical and political possibilities for this alternative approach is also included at the end of this section. This discussion is a recognition that, as with educational change in other contexts, identifying what needs to change is the comparatively easy part – implementing the change is the real challenge.

A critical understanding of the future, technology and the global context

One of the themes of this research has been the way in which educational computing policy has drawn upon politicised and simplistic notions of the future. One of these versions of the future involves an optimistic sensibility in

which students are likely to achieve new and high levels of success through computers. Frequently this success is linked with achievement in the classroom. It is also linked, as a longer term outcome, to the future careers of students, and in more recent times, to the knowledge economy. This version of the future is a rosier point of view about educational computing as 'the next big thing'.

A related and darker reflection on the future is one in which New Zealand students, or the country as a whole, may be left behind by not adopting technology in the classroom. This version of the future turns the optimism above into a form of fear, especially for parents and the community. At its most extreme, this politicisation of the future characterises New Zealand's destiny in terms of the 'third world' should our students and education system fail to fully embrace classroom technology. Since 1987 this point of view has been frequently connected with the importance of a skills-based, enterprise and vocationally relevant curriculum.

The optimistic and related fear-based 'knowledge economy' characterisations of the future are not the only possible points of view. Alternative constructions of the future create new dynamics for educational policy. These constructions could involve less acceptance of the politics structuring the current World Trade Organisation (WTO) and corporate-led approach globalisation. Instead of an educational and political future concerned primarily with the knowledge economy, the focus could be aimed at supporting greater environmental protection and sustainability, the rights of indigenous cultures and the importance of social justice.

As these examples demonstrate, alternative approaches to the future begin with a different set of assumptions to those which have structured educational computing policy up until 2004. Within such approaches technological development is likely to be seen, not so much as a key to prosperity, but as a complex factor in social development and environmental change. Technology is likely to be understood as both beneficial and problematic, positive and destructive. Education and technology too are subsequently framed in a different perspective. Just as technology can be problematic in a global context,

it can also be problematic in a classroom context. More thoughtful use of technology is implicit in such an approach as technology is likely to have a range of positive and negative impacts on the social context of learning.

Reconsidering education, computers and schooling

One of the aspects discussed in this thesis is the role played by the liberal-progressive philosophy of education. From the 1960s to the 1980s educational computing has, to varying extents, subsequently been structured by the vision of education presented by Charles Beeby and Peter Fraser. This approach has not been at the exclusion of other ideas about education and throughout the period examined in this thesis, educational computing has, for instance, also been influenced by economic and psychological rationales. Indeed from the 1990s educational computing policy, much like education policy overall, has been dominated by busnocratic and constructivist rationales.

Busnocratic rationales originate from utilitarian and instrumental points of view about education. These rationales have strongly linked education to business and education policy to economic policy. The strength of this ideology has arguably been influential in why more thoughtful educational computing policy has not been developed. Computers have been useful in a number of business and scientific contexts (although they have also demonstrated a number of important failures). It has therefore become a form of 'common sense' to assume that computers offer a similar easy benefit to education. The fact that computers have thus far struggled to significantly benefit education, has been written off as a glitch, a hiccup or a sign that somehow research has not caught up with practice.

In a way, the dogmatic urgency to have computers in the classroom has over-ridden questions concerning their lack of success. Employers, we are told, require people who have employable skills and, from the 1990s onwards, it has been the education system's ***primary*** role to provide such skills. As has been suggested in this thesis, the aligning of economic and educational policy can be understood as an attempt to structure schooling. Educational computing has

been a key leverage point for those arguing that education should be primarily concerned with the development of employable skills.

Computers have uses apart from those at work. It is also possible that education with computers can be conceptualised within a broader range of social, personal, developmental, artistic, environmental and community goals and processes - aside from employment. Similarly, broader frameworks for developing policy and pedagogy with computers should be drawn upon more than those psychological points of view involving constructivist interpretations of teaching and learning. In order to do so however, demands political interaction and elbow room against these dominant economic and psychological rationales. Indeed any significant effort to use computers in a broader educational effort needs to understand the politics of both education and of education with computers and understand that in fact there are alternatives to constructivism, 'digital literacy' and, as was discussed above, a future characterised by global economics, technological skills and market imperatives.

> Digital literacy is the ability to appreciate the potential of ICT to support innovation in industrial, business and creative processes. Learners need to gain the confidence, skills and discrimination to adopt ICT in appropriate ways. Digital literacy is seen as a 'life skill' in the same way as literacy and numeracy.[14]

The basis for reconsidering the aims of education with computers has been introduced through the themes of this thesis. Critical pedagogical ideas present a radical alternative to ways in which computers have been justified by governments and educators. Not that such a discussion should be limited to the use of technology alone, and, in line with the emphasis placed on the social context in this thesis, this approach can be expected to carefully use (and not use) computers in a way that supports education for human development, creativity, environmental sustainability, citizenship, as well as employable skills.

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[14] Ministry of Education (2002). *Digital Horizons.* Wellington: Ministry of Education.

The non-neutrality of educational technology

Within an ethical and critical pedagogical approach to educational technology it is also important to understand that computers are not just tools. Computers have a complex relationship with the social and political context. As so much of the human behaviour connected to the internet has demonstrated, computers create new dimensions for social activity. They can 'reflect' many of the positive and negative aspects of the context and they can also 'affect' nature of the context through new ways of interacting and responding. [15]

Computers, like all forms of technology, are therefore political devices that can change the distribution of power in a social context. In history, it is relatively easy to see how new technologies have affected indigenous populations and minority languages. In 21st century western civilisation the impacts of new technology are, in some ways, less obvious. Its impacts are present nevertheless in situations such as the development of powerful corporations, which use technology to centralise and control their world-wide operations; and from a classroom perspective, where Americanised gender-biased software is used to present fragmented forms of knowledge.

In this sense, the non-neutrality of computers extends to the fact that computers are cultural devices. Computers are products of the market economy with strong links to the logic of globalisation, technological progress and on-line access. The cultural bias of computers is linked to concepts that are counter to artistic, environmental and humane notions. These cultural dimensions have to be considered and negotiated in any more enlightened approach to classroom activity involving computers.

Educational technology and the social context

As this last sub-section suggests, technology works within the social dynamics that structure social and power relationships. Technology reflects and affects the social context, and as has been observed in educational practice, frequently operates to reinforce, rather than transform existing practices. Ironically, for all

[15] H. Bromley (1998). Introduction in H.Bromley and M.W. Apple. (Eds). *Education, technology, power: educational computing as a social practice*. Albany: State University of New York Press.

the technological progress made in educational computing, it was the educators in the earlier periods of this thesis that seem to have been more likely to understand that computers could 'affect and reflect' aspects of the social context. For instance earlier educational computing policy, and its (albeit in vain) attempts to develop computer awareness in junior and senior classes actually demonstrate a more balanced appreciation of the positive and negative potential technology than 2004's concept of digital literacy.

Understanding the relationship between technology and the wider society is only one aspect to be understood. The processes and content of education have to be reconsidered in an improved approach to educational computing policy. Many of the efforts in New Zealand's educational computing have been centred on the technology itself. From the small evaluations connected with the Poly computer, through to the Exploratory Studies and, more recently, the digital opportunities projects and Ministry of Education e-fellows, technology has been at the centre of research – as if teaching with technology was predominantly a technical process, rather than a social and political one.

In the future, accompanying an understanding of technology's ability to affect and reflect the social context, should be an understanding of the social context itself. That is to say educators and policy makers need to be open to the power structures and social dynamics of the social context, of the people effects. Indeed these need to be emphasised and understood before technology is used as an 'addition' or any aspect of a 'solution' to social problems such as mediocre education practice.

Educational technology and improvement

In some ways it can be argued that technological optimism in New Zealand education policy has increased over time. In more recent time, as *Chapters Seven* and *Eight* discuss, psychological approaches to learning have combined with economic rationales for ICT and created an educational computing policy context ambitious for dramatic improvements across the education system. These improvements have not occurred – although they have required an increasing amount of money.

This potential increase in optimism is instructive in relation to the points made above. Namely that an understanding of the non-neutral qualities of technology, and technology's tendency to affect and reflect the social context, should actually temper optimistic forecasts of what technology will add to educational contexts. A more sophisticated relationship between educational policy, the social context and new technology is therefore required to understand the ways in which particular positive developments in education might occur. As is set out in the first of the above sub-sections, an important starting point for this process is the way in which education has been limited to workplace development. Through technological improvement and economic development, optimistic educators and policy-makers have often been heading towards 'The Next Big Thing' without questioning if the actual 'education' philosophy underpinning this position is actually worthy. Indeed if educational improvement is so dependent on technology – what sort of educational improvement is this likely to be? Will we still want it when, (or if) it arrives?

This point emphasises an understanding of what is possible with educational technology and whether or not it should be attempted. Implicit in this is a deep questioning about the extent to which the government and schools have invested in educational technology – without a good understanding of what this investment would or should achieve. Educational technology does not catalyse schooling into powerful opportunities for all students to grow and learn. Providing the technology which can allow communication between schools from different parts of the planet does not ensure that this communication occurs and that, if it does, that it is of some educational worth. Educational improvement is dependent on many other, more important factors, than ICT, and should be based in a more considered ethical framework than the knowledge economy.

Into the future – what are the chances?

There are fundamental philosophical differences between the future implied by the educational computing policy context in 2004, and the alternative approach suggested above. These differences are seen in the non-neutral nature of

technology and the relationship between technology and the social context. The question arising from a more sophisticated understanding of such ideas, is the extent to which this alternative is feasible. What are the key issues in developing such alternative and to what extent can social and political context move to such a position?

At a broad political level there is arguably some potential in an alternative approach given that Third Way approaches to government have shown some political will to temper previous hard-line economic approaches to policy. However, based on the evidence of New Zealand's Third Way approach to educational computing policy, it would appear that a number of significant political developments would have to occur before an alternative framework can be introduced. As was suggested in *Chapter Eight*, Third Way politics in New Zealand's has not substantially altered the economic and global frameworks in which policy is formed. It has attempted to practically modify these frameworks, and in this sense may offer an incremental way forward, yet it has for accepted the economic and structural rationalism of these frameworks. Globalisation is seen predominantly as inevitable at worst, or an opportunity at best. Environmentalism is seen as its own policy area (rather than an integrated component of all policy) and education is seen as a primarily economic policy area.

Another reason for being sceptical that a substantial change is possible in the educational policy paradigm, is that global and business forces provide highly influential guidelines and incentives for governments. The OECD, the World Bank, the various ICT-based Corporations, have considerable power compared to those who argue for a more sophisticated and critical alternative to government policy. Such forces are not simply overturned through good ideas alone – even where individual members of a government may agree with such points of view.

Many educators and parents are also satisfied with the economic rationales for education and educational computing. In this manner there would appear to be very little room for governments to lead the development of more enlightened

educational computing policy. While individual educators may follow more thoughtful, activist and critical pedagogical lines, it seems unlikely that a government would work against mainstream educator-groups, as well as the ICT-based businesses, keen to increase the use of computers in schools.

Technology is of course an important part of today's society. Part of the reason for the success of a fear-based argument for the development of computer skills, is that, to some extent, it is true. At some point most students will have to apply technological skills in the future and in the workplace. Technological skills and the role of schools to produce these skills, seems, on the surface at least, a responsible way forward. The question, however, arises to what extent can schools manage such skill development and what other ethics and knowledges should they be developing? How far can, and should, schools attend to the need for skilled 21st century workers and how far should they go to delivering an education system focussed on more a broader set of goals based on democratic, artistic, environmental and developmental aims for education? An answer to such a question has already been implied by this thesis. More importantly however, is how it is answered in and around the policy context.

In considering the 2004 policy position on educational computing, it seems more likely that any change to this approach will come from existing neo-liberal and conservative political positions in some form of backlash to computers in schools. Given the money allocated to computers in schools and the questionable developments that have occurred in computer-based learning, it is conceivable that New Zealand will follow overseas trends in having more public questioning about the use of computers in schools. The likelihood of such a backlash would be increased if a downturn in the economy occurred and questions arose about the level of government spending in school ICT. Such a backlash, if it follows similar trends overseas, is also likely to be linked to 'back to basics' type educational discussions.[16] In a sense the busnocratic rationales in the education policy context may divide into those wanting to concentrate on traditional skills and knowledge and those wanting to see schools use computers

[16] See for instance the discussions and points raised at http://www.edtechnot.com/

to make transformations in their learning. Either point of view is likely to be more dominant than the alternative, critical approach to educational computing outlined above.

Directions for future research

Although a critically-informed approach to educational computing policy seems unlikely in the short or medium term, there is no reason why individual teachers can not apply more enlightened approaches to using or resisting educational technology. In a comparable way, the obligation to offer thoughtful insight to educational computing policy context is not removed by the difficulty in developing immediate change.

This section offers a brief list of the opportunities for future research. Its purpose is to provide a starting point for future work in this area and to translate some of the learning and ideas from this thesis into new ways forward. This set of research ideas has been structured into two groups. The first set of research ideas relate to specific areas already discussed in this thesis. This includes, for instance, extending the work done in each of the chronological chapters of this thesis. The second set of research ideas address more fundamental issues underpinning the theses and ideas of this work. These ideas address notions of the future, education and technology and provide broad and conceptual directions to consider the ideological underpinnings of educational policy.

Research extending on aspects of this thesis

A number of ideas for potential research were introduced at the beginning of this thesis. These research ideas were related to the scope and content of this research. These research areas include: senior secondary school computing, educational computing in Maori-medium schools, the development of technological infrastructure, computers in school administration and the role of educational technology in distance education. One advantage of working in these research areas could involve comparing some of the key findings and trends developed in this work.

A significant amount of research is also possible in a comparison of the history of New Zealand's educational computing policy with that of other countries. Such research would provide an opportunity to examine the extent to which similar rationales have affected the development of policy overseas. This could be undertaken in relation to both developed and developing countries. It could also include a focus on how technology corporations have worked with governments and how certain points of view have become more important than others.

Research involving comparisons in the policy context could also include an examination of the educational computing policy context in relation to other areas of the New Zealand curriculum. The technology curriculum, the science and mathematics curricula, are likely to reveal areas to compare and contrast against the development of educational computing policy. This is not to say that broader curricula developments could not be included in such research, in that all areas of curricula development, and other innovations designed to bring about educational improvement, could be considered alongside this research to uncover other findings about the development of educational policy.

The changing educational paradigms affecting educational computing policy also suggest that there is worthwhile research in detailing how pedagogy with computers has changed over time. Such research would provide a way of understanding how tensions discussed in this research have been variously responded to by teachers and schools. One of the difficulties in such research would be in capturing the differences in pedagogy between teachers, including the degree to which alternative approaches have operated outside of any mainstream ways of operating. It would also be of interest to understand how teachers have negotiated the various policy positions of government and the specific solutions schools have used to develop or avoid educational computing in their classrooms.

There are research possibilities in exploring particular chapters or events discussed in this thesis. The story of the poly computer, for instance, could be described in more detail than was possible in this thesis. Likewise for the

Exploratory Studies and the development of the first ICT strategy for schools – *Interactive Education*. Additional information for such work could be provided through interviews with the policy makers, teachers and teacher-educators of the time. Such interviews are likely to provide information on the specifics of what occurred and provide additional detail about the influence of certain personalities and points of view.

Additional topics of historical interest also include the development of programmed instruction in New Zealand, or, indeed, the development of constructivist pedagogical rhetoric and practice. Historical research into programmed instruction in New Zealand schools would be able to provide an insight into the degree to which such an approach has been developed in New Zealand schools and those forces which promoted and limited the development of such techniques. It can be expected that such research would provide additional detail on how financial, philosophical and pedagogical rationales have affected school decision making about the use of computers in strongly behavioural ways. Research into constructivist pedagogy could explore its relationship to policy and/or classroom teaching, including its role in curriculum development and connection to the economic points of view that affect much of education policy.

Research addressing fundamental aspects considered by this thesis

Outside of these more direct possibilities for future research, there are also a number of more fundamental research possibilities implied by this thesis. These research ideas revolve around the themes identified in this thesis for New Zealand's educational computing policy, especially the concepts connected with the future, educational policy and technology.

This thesis has characterised the development of educational policy, or at least in this case, educational computing policy, as a battle about the future. In convincing the policy audience of the need to achieve a certain future, the politics of educational policy can be won and lost. As the future becomes an ever-increasing technological blur, how the future is characterised is likely to be

crucial for ongoing policy discussion. More research is required on how certain characterisations of the future affect educational policy, who benefits from these characterisations, what alternatives are possible and how they might inform the educational policy debate.

Included in such research may be attempts to understand the broad ramifications of the political ideologies structuring educational computing policy. These rationales are linked to those which have shaped global trade policy, foreign policy and policies for social welfare and health. What are the actual effects of these policies and rationales on the various peoples and ecologies of the world? Is this the best possible set of rationales structuring government actions and is this likely to lead to the best possible future? In broad terms it may be possible to build scenarios based on the trajectory of such policies and from this point consider not just the benefits and pitfalls of the current policy paradigms, but the plausible alternatives to the future.

Research on the future and education policy therefore implies links to global policy forces and broad structures affecting the points of view of policy makers. While instrumental, neo-liberal or new right ideas about education and technology are chillingly built on a utilitarian, vocational and electronic logic, it has never been the contention in this thesis that such a position is permanent or not subject to other sorts of forces. While enlightened approaches to education policy are hampered by a variety of strong global and political structures, there is, nevertheless, still the possibility of a future less about a cybernetic education and more about human potential. A different sort of future.

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