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A case study of e-learning initiatives in New Zealand's secondary schools

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A CASE STUDY OF E-LEARNING INITIATIVES IN NEW ZEALAND'S SECONDARY SCHOOLS

A dissertation submitted in partial satisfaction

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Doctor of Education in Educational Technology

by

Allison Powell

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DEDICATION

This dissertation is dedicated to my parents. They have been there through all of my failures and accomplishments and have provided encouragement and instilled in me the value of creativity to dream big and the discipline and motivation to reach my goals and to continue to search for new possibilities. They are my two biggest fans and two of the most wonderful people on Earth!

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I wish to thank the members of my dissertation committee: Dr. Jack McManus, Chair; Dr. Paul Sparks and Dr. Neal Strudler for their support and encouragement in this process.

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And last, but certainly not least, I would like to thank all of the people that have supported me throughout my doctoral journey. To my friends (especially Joe), roommates, co-workers, cadre mates, and family who have been my cheerleaders, punching bags, disciplinarians, distracters, and great friends at various points throughout this process. I never would have finished this without all of you!

I thank you all!

VITA

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K-12 School Experience:

- Coordinator, Online Professional Development, Clark County School District, Las Vegas, NV, 2007-2008
- Coordinator, Instructional Web Design, Clark County School District Virtual High School, Las Vegas, NV, 2002-2007.

- K-8 Online Teacher, Odyssey Online Charter School, Las Vegas, NV, 2001-2002.
- Math and Science Teacher, Leid Middle School, Las Vegas, NV, 2000-2001.
- 3rd Grade Teacher, Katz-McMillan Cooperating Elementary Schools, Las Vegas, NV, 1999-2000.
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Teaching Experience

Online Professional Development/Training Workshops, Courses, and Programs

- Using free Web 2.0 Tools in Online and Blended Learning Environments
- CCSD Online Professional Program: Teaching CCSD Teachers to Teach Online
- Clark County School District Virtual High School: Webinars, Workshops, Courses for Online Learning, Transitioning High School Courses from Face-to-Face to Online Environments, Teaching CCSD Teachers to Teach Online, and Web 2.0 Tools, and Technology Integration

Research and Other Scholarly Activity

Reports

- Powell, A., Patrick, S. (2009). A Summary of Research on the Effectiveness of K-12 Online Learning. *i*NACOL. Vienna, VA.
- Cavanaugh, C., Barbour, M., Brown, R., Diamond, D., Lowes, S., Powell, A., Rose, R., Scheick, A., Scribner, D., and Van der Molen, J. (2009). Research Committee Issues Brief: Examining Communication and Interaction in Online Teaching, iNACOL. Vienna, VA.
- Powell, A., Patrick, S. (2006). International Survey of Online Learning Initiatives. Vienna, VA: International Association for K-12 Online Learning.

Professional Consultancies

- Online Teacher Training. (2009). Brooklyn, NY Schools, New York, NY.
- Online Teacher Training. (2008). VOISE (Virtual Opportunities Inside a School Environment), Chicago Public Schools, Chicago, IL.
- Web 2.0 and Online Teacher Training. (2008). Louisville, KY.
- Starting an Online Program. (2007). New Mexico State University, Las Cruses, NM.
- Special Projects. (2006). International Association for K-12 Online Learning, Vienna, VA.

Presentations & workshops

- Alabama ACCESS Online Teacher Training Keynote – Birmingham, AL – June 2010
- K12 Inc. and Orthodox Union Meeting, Herndon, VA – April 2010
- CoSN Annual Conference, Washington, D.C. – March 2010
- Boise State University Education Technology Graduate Programs Webinar, Boise, ID – February 2010
- Association for the Advancement of International Education Annual Conference (AAIE), Boston, MA – February 2010
- Office of Overseas Education Annual Board Meeting, Washington, D.C. – December 2009
- Google Teacher Academy, Washington, D.C. – December 2009
- Alaska Department of Education Testimonial, Juneau, AK – December 2009
- Florida School Choice Conference, Orlando, FL – November 2009
- VSS Virtual School Symposium, Austin, TX – November 2009
- Virginia Education Technology Conference, Richmond, VA – October 2009

- SES Conference, Los Angeles, CA – September 2009
- Louisiana State Department of Education Testimonial, Baton Rouge, LA – September 2009
- ETLO Webinar, New York, NY – August 2009
- K12 Inc. Annual Teacher Training Conference Keynote, Herndon, VA – August 2009
- Full Sail University Graduate Programs Webinar, Orlando, FL – July 2009
- College Board Advanced Placement (AP) Annual Conference, San Antonio, TX – July 2009
- NECC, Washington, D.C. – June 2009
- Center for Digital Education ARRA Roundtable Leader, Washington, D.C. – June 2009
- Center for Digital Education Event for Washington, D.C. Schools, Washington, D.C. – May 2009
- Intel Visionary Conference, Washington, D.C. – April 2009
- PLATO Learning Webinar, Washington, D.C. – April 2009
- Pepperdine University Graduate Student Cadre, Washington, D.C. – April 2009
- Alaska Legislative Testimonial, Juneau, AK – April 2009
- CUE Annual Conference, Palm Springs, CA – March 2009
- CoSN Annual Conference, Austin, TX – March 2009
- VSS Virtual School Symposium, Glendale, AZ – October 2008
- COVITS - Commonwealth of Virginia's Innovative Technology Symposium, Williamsburg, VA – September 2008
- ED-MEDIA, Vienna, Austria – July 2008
- NECC SIG Pre-Conference Keynote, San Antonio, TX – June 2008

- CUE Annual Conference, Palm Springs, CA – March 2008
- Hawaii Legislative Testimonial, Honolulu, HI – December 2007
- Virtual School Symposium, Louisville, KY – October 2007
- Centra Symposium, Boston, MA – May 2007
- CA Legislative Testimonial, Los Angeles, CA – March 2007

Prepared and delivered presentations about e-learning in Virtual High Schools. Presentations focused on starting virtual high schools, hybrid online learning (synchronous/asynchronous), software used in virtual high schools, DVD/Video courses, eLearning on an International level, online course content and projects, and a showcase of the Clark County School District Virtual High School.

- Virtual School Symposium, Dallas, TX – November 2006
- North American Council for Online Learning Regional Conference, Los Angeles, CA – October 2006
- Nevada Online Education Consortium Conference, Henderson, NV – March 2006
- Vision for the Future Conference, Las Vegas, NV – February 2006
- Hawaii International Conference on Education, Honolulu, HI – January 2006
- Virtual Schools Symposium, Denver, CO – October 2005
- Centra Summit, Boston, MA – May 2005
- Council of Great City Schools, Las Vegas, NV – October 2004
- Centra Summit, Boston, MA - May 2004
- Educational Computing Specialists Conference, Las Vegas, NV - June 2004
- Vision for the Future Conference, Las Vegas, NV - March 2004
- Tenth Annual National Conference on Alternatives to Expulsion, Suspension, and Dropping Out of School, Orlando, FL - January 2004
- National School Board Association T+L2 Conference, Anaheim, CA - Oct. 2003

- Nevada Association of School Administrators Conference, Lake Tahoe, NV - June 2003
- Centra Summit, Boston, MA - May 2003
- Nevada Technology Leadership Conference, Las Vegas, NV - April 2003
- Vision for the Future Conference, Las Vegas, NV - March 2003
- Nevada Distance Education Conference – October 2002
- Virtual High School Symposium, Denver, CO - October 2002
- National Teacher of the Year Conference, Las Vegas, NV - June 2002
- Centra Summit, Boston, MA - April 2001

Service

- TxVSN Advisory Board – June 2010 - present
- National Science Digital Library and Office of Science and Technology for the White House Open Educational Resource Committee – February 2010 – present
- Blackboard Pipeline Council – July 2009 - present
- NCAA Student Records Review Committee member – March 2009 - present
- Full Sail University Masters of Education Advisory Board – February 2008 – present
- DaVinci Schools Advisory Council – December 2007 - present
- ASCD: Association for Supervision and Curriculum Development – Committee member to bring local affiliate chapter to Southern Nevada – January 2006 – October 2007
- NASA Tiger Team – Online Learning and Digital Content – February 2008
- AOII: Alpha Omicron Pi – Alumnae Chapter Member and Richmond, VA – June 2008 – present
- AOII: Alpha Omicron Pi – VCU Chapter Officer Advisor, Richmond, VA – June 2008 – December 2008

- CCASA: Clark County Association of School Administrators – December 2000 – October 2007
- ISTE (International Society for Technology Education – Special Interest Group for Online Learning – 2008 - present
- CUE – SN: Computer Using Educators– Southern Nevada – Executive Board Member
  and President Elect – May 2005 – December 2008
- NACOL: North American Council for Online Learning – Board of Directors Member,
  Secretary of the Board, Consultant, Executive – September 2006 – October 2007
- NACOL: North American Council for Online Learning - Research and Conference Planning Committee Member – September 2003 – October 2007
- NASA: Nevada Association of School Administrators – December 2000 – October 2007
- NOEC: Nevada Online Education Council – Co-founder and Executive Board Member – October 2002 – October 2007
- NOEC: Nevada Online Education Council - Conference Planning Committee – October 2002 – October 2007

Professional Activities

- CUE member: Southern Nevada Chapter – since 2006
- PDK member: Phi Delta Kappa – since 2010
- AERA member: American Educational Research Association – since 2005
- ACM member: Association for Computing Machinery - since 2005
- CoSN (Consortium for School Networking) – since 2003
- ASCD member: Association for Supervision and Curriculum Development - since 2001
- ISTE member: International Society for Technology in Teaching – since 2001

Educational Awards and Recognition

- Founder's Award, Computer Using Educator's Southern Nevada Chapter – 2007
- Innovator Award from North American Council for Online Learning – 2007.

ABSTRACT

There is a shift occurring in education systems around the world, which could change the face of education as we have known it through blended and online learning. E-Learning offers opportunities and possibilities that were unknown to educators over a decade ago. Countries, states, and school districts are implementing online and blended learning environments to offer world class educational opportunities to all students no matter their zip code or socio-economic status.

In general, research in the field of K-12 online learning has focused on the United States and Canada. However, an international survey of online learning in initiatives conducted by the International Association of K-12 Online Learning (iNACOL) in 2006 showed that other countries were implementing online learning initiatives with different approaches.

This survey provided a snapshot of 15 countries e-learning initiatives; however, there is very little research that further describes what is happening in each of these countries, validating the need for further research in the area of K-12 online learning initiatives.

The purpose of this study will be to describe the current e-learning initiatives and projects for students in secondary schools in New Zealand. The research looked at both the policy and practices happening within New Zealand's education system as the iNACOL survey showed them to be one of the most innovative countries in the area of

K-12 online learning, which may help other countries implement their own e-learning initiatives.

The research design was based on a case study format, with qualitative data. A total of 19 people participated in interviews for the study. The data collection instrument was an interview protocol to guide face-to-face and online learning of Ministry of Education officials and secondary school principals and teachers.

The findings of the research indicate that New Zealand has been successful in implementing online learning initiatives because it started with schools and educators needing to fulfill basic needs in order to survive. These grassroots movements are now reforming the way they educate students in all learning environments in New Zealand.

Chapter I: Introduction

"E-learning is a powerful instructional strategy because it transcends the boundaries of traditional classroom instruction. In fact, it creates virtual schools that allow learning to occur at the student's initiative - any time, any place" (Blomeyer, 2002, p. 1). Online learning is also bringing equity to students as it is providing access to courses and teachers for all students, no matter their zip code or socio-economic status.. E-Learning offers opportunities and possibilities that were unknown to educators over a decade ago.

> E-learning has the capacity to grow, and the early results demonstrate the benefits of students and parents being given the choice of a variety of learning options, from fully online courses at a distance, to classroom-based courses, with blended learning options in between (Watson, J., Gemin, B., & Ryan, J., 2008, p. 10).

A disruption to education systems in countries across the world, e-learning is allowing for interactive and accessible environments for students to learn at their own pace, no matter their neighborhood or income level.

In 2006, the International Association for K-12 for Online Learning (iNACOL) surveyed several countries and highlighted the most up to date information about "current initiatives, funding, student populations, content development and quality control, professional development, and current trends and obstacles" (Powell & Patrick, 2006, p.3) in the area of K-12 e-Learning. Based on the responses of the New Zealand Ministry of Education's to the survey, the study determined that the country of New Zealand had implemented some of the most innovative ideas in this field, prompting further research into how this had been done. This study is designed to be built on that finding.

New Zealand is an island country in the southwestern Pacific Ocean comprising two main landmasses (the North Island and the South Island), and numerous smaller islands, located in the southern hemisphere. New Zealand is a small country, about the size of Japan or Italy, which is very isolated from the rest of the world, with its closest neighbor, Australia being 1250 miles away. Because of the country's isolation the New Zealand Ministry of Education (2006a) has said,

> Education plays a critical role in the development of our economy and society. Human capital has long been identified as a key factor in driving economic growth and improving economic outcomes for individuals. There is also growing evidence of its influence on non-economic outcomes, including health and social inclusion (p.6).

"Industrial society is being overtaken by the knowledge society, we are told, and our country is in danger of being left behind, should we fail to prepare today's students for tomorrow" (Goodwin, 2007, p.4). With this in mind, the current government's economic objectives are centered on pursuing free-trade agreements and building a "knowledge economy". The New Zealanders, often known as Kiwis, believe that it is important for all learners to "develop the skills and knowledge they need be full participants in the global community" (New Zealand Ministry of Education, 2003, p.3) and to reach their personal goals in order to be confident and creative citizens.

In the mid 1980s, New Zealand's education system undertook a series of curricular innovations and related infrastructure developments, which have recently caused a major shift to more self-governing schools and a push to more parental involvement. With this new independence, secondary schools are starting to move from the efficiency-driven perspective of education, where teachers teach "the same subjects,

in the same way, and at the same pace to all children in the classroom" (Christensen, C. M., Horn, M. B., & Johnson, C. W., 2008, p. 35) to more personalized learning, which allows teachers to "respond to the needs of all students, taking into account their strengths, aspirations, and needs" (Jones, 2008, p.15) through e-learning. In this new ability-driven, learner-centered system, "education is for personal growth and is about the presence of real experiences in social worlds" (Ai-Girl, 2004, p. 105) where each person is encouraged to reach his or her full potential and can contribute to their society in the area where their skills are best suited.

As a complement to the pedagogical changes in the education system, New Zealand schools are also embracing technology as a tool for teaching. In 1998, the Ministry of Education developed their first strategy for developing ICT in the country's schools. The original strategy "provided information on initiatives to help achieve the joint goals of building infrastructure and school capability" (New Zealand Ministry of Education, 2003, p.4). Building on the MOE's first aspirations, "The Digital Horizons Learning Through ICT" strategy was launched in 2002. The main goal of Digital Horizons was to "ensure New Zealand continues to move forward as an innovative thriving knowledge society" (New Zealand Ministry of Education, 2003, p.2) through education and ICT. To meet this challenge, goals and strategies were created for each of the key stakeholders: learners, teachers, leaders, Maori, and families, communities, businesses and others. Key dimensions of the Digital Horizons strategies were also identified, which included curriculum and learning resources, infrastructure, and professional development" (New

Zealand, Ministry of Education, 2003). The hope for this national plan is to develop "a more flexible, adaptable, and student-centered learning culture" (p.7).

During the third phase of the country's ICT Strategic Framework for Education, which was launched in 2006, eight years after the original plan, the goal for education was to "improve learner achievement in an innovative education sector, fully connected and supported by the smart use of ICT" (New Zealand Ministry of Education, 2006b, p.2). This document provided a framework for schools to meet the goals of ICT in schools.

The latest strategy, *Enabling the 21st Century Learner: An e-Learning Action Plan for Schools 2006-2010*, places "the learner at the centre of the education system" (New Zealand Ministry of Education, 2006b, p.3) to provide a "flexible system where teachers, schools, communities, and other groups can identify the needs of their learners and be provided with the tools and support to meet those needs within the broader curriculum" (p.3). In a sense, it is the fourth phase of the IT program, and the ministry builds on the previous strategies and hopes to accomplish their goal through the use of e-learning in the latest strategy.

Table 1

New Zealand Ministry of Education's ICT Strategies and Components

NZ MOE ICT Strategies	Year	Key Component #1	Key Component #2	Key Component #3	Key Component #4
ICT Strategy	1998	Develop the use of ICT in Schools	Build Infrastructure	Build School Capability	Enable educators to gain skills and insight into potential of ICT in education
The Digital Horizons Learning Through ICT	2002	Improve learning experiences and outcomes for all students	Support educators in integrating ICT into curriculum and management practices	Increase efficiency and effectiveness of educational management and administration	Develop partnerships with communities, businesses and other stakeholders
ICT Strategic Framework for Education	2006	Provide a mechanism to guide and co-ordinate ICT investment	Provide a strategy for effective and integrated use of ICT across all parts of the education sector	Improve learner achievement in an innovative education sector, fully connected and supported by the smart use of ICT	
Enabling the 21st Century Learner: An e-Learning Action Plan for Schools 2006-2010	2006	Describes the goals for e-learning in schools and the projects, tools, and resources that are being developed to address those outcomes	Demonstrates how e-learning can contribute to the Schooling Strategy and its priorities for the next five years	To build an education system that equips New Zealanders with 21st century skills, through the increased use of e-learning in schools	

(New Zealand Ministry of Education (2003, 2006a, 2006b))

The ministry sponsors technology competitions, sponsors and creates projects and resources for students, and also encourages their students to develop these resources for learning on the Internet for the goal of personalizing learning.

> Personalized learning is an idea for our time. It's recognition of human uniqueness – we are not trying to turn out assembly-line children. It means redesigning our schools to fit the pupils rather than what we do now, which is to force them to fit into existing structures. It means a focus on learning, learning for understanding, learning for meaning and giving people time (Pullar & Brennan, 2008, p.11).

With the advancements in technology, the ministry has focused their goals on e-learning, which "can provide accessible, relevant, and high-quality learning opportunities so that every student is better able to achieve their full potential" (New Zealand Ministry of Education, 2006b, p.4).

Based on the results of the 2006 iNACOL International Survey, New Zealand is at the high end of the scale for implementing innovative e-Learning initiatives in their K-12 schools. As of November 2006, the country had outlined "the key outcomes and actions for e-Learning in the New Zealand school sector for 2006-2010. It [e-Learning Strategy] describes the goals for e-Learning in schools and the projects, tools and resources that are being developed to address those outcomes." (Powell & Patrick, 2006, p.19). Because of the country's rather small population and its insularity, there is a need to provide a high quality education for all students, no matter where they are located geographically so that each student is better able to achieve their full potential by "managing self, relating to others, participating and contributing, thinking, and using language, symbols, and texts" (New Zealand Ministry of Education, 2006b, p.8). The Ministry of Education strives to

reach this goal through e-learning, including blended learning environments, and is providing funding and professional development opportunities for schools, allowing for the quick implementation and buy-in of the entire country to implement a countrywide e-Learning initiative. New Zealand has a strong and robust education system that has been a key source of competitive strength, being one of "six countries that consistently make it to the top ten. Others on this list include: Finland, Canada, Japan, Netherlands, and Australia" on the Program for International Student Assessment (PISA) tests (Hopkins, 2007, p.1). It is evident from the iNACOL study and the little research available about the country's education system that their circumstances differ from most other countries, and that not every country can achieve what New Zealand has done with K-12 education. However, it might be possible to learn some basic ideas from their process and experiences. We can learn both the positives and negatives about their processes for implementing a successful e-learning program within our secondary schools in order to build new and grow current online learning programs around the world in different environments.

> As the New Zealand Ministry of Education's e-Learning Strategy reports,
>
> e-Learning can contribute directly to all of the competencies, and increasingly, these competencies are applied in ICT-rich contexts for all students….The further evolution of these technologies and the development of new technologies will play a key role in New Zealand's transformation into an innovative knowledge society (2006b, p.8).

Education and Learning, especially in our young is essential in maintaining New Zealand's competiveness. The innovative and effective use of ICT in this sector is a key

enabler in transforming the teaching and learning experience, and will better prepare our children for a more dynamic and uncertain future. In this area, New Zealand has built a strong foundation from the past ministry strategies and is well poised to make quantum leaps to enhance their national capacity. New Zealand schools are embracing and using technology unseen in all but a few countries. Leaders of the country hope that this shift toward technology will not only produce more educated students, but also develop a new breed of Kiwis, one that will bring the country to the forefront of the global marketplace. With this new embrace, it is evident that New Zealand has achieved much greater progress than many other countries in the use of technology to improve student learning. However, to date there is no extensive study that identifies the characteristics of the development of the technology-based education in New Zealand. Neither the successes nor the false starts have been explored in any formal fashion. Because of this lack, this study will conduct an in depth exploration of the current e-Learning initiative in New Zealand's secondary schools.

Statement of the Problem

> While K-12 online learning programs have evolved and grown nationally over the past decade, the amount of published research on virtual schooling practice and policy is limited. The current literature includes practitioner reports and experimental and quasi-experimental studies, both published and unpublished (Cavanaugh, Barbour, & Clark, 2009, p.2)

in the United States. On an international level, even fewer reports and studies have been published and "little information is available about current K-12 e-learning initiatives across the world," (Powell & Patrick, 2006, p. 1). In addition to the lack of research, the

research that is available on K-12 online learning is "focused in the earlier years (1990s) on the effectiveness of virtual schooling by comparing it to traditional schooling and issues surrounding student readiness for and retention in virtual schooling. In recent years (post-1999), the growing body of literature shifted to a more refined description of practice and outcomes in virtual schools" (Cavanaugh, Barbour, & Clark, 2009, p.14). This lack of in depth research outside of the United States creates a need to collect data and to research K-12 e-learning on a global scale.

As indicated above, in 2006, the International Association for K-12 Online Learning (iNACOL) conducted a survey of international e-Learning initiatives from over 100 countries around the world. Fifteen countries responded, including New Zealand. Based on the responses provided by the New Zealand Ministry of Education response to the iNACOL International Questionnaire, and based on the apparent success of their educational technology efforts, the researcher has chosen to study the country of New Zealand's secondary e-learning initiatives. New Zealand has one of the best online education environments in the world, according to most studies, but nobody has ever explored in a systematic fashion what is working and what has not worked in implementing the technology-based program over time.

Purpose of the Study

The purpose of this study will be to describe the current e-learning initiatives and projects for students in secondary schools in New Zealand. New Zealand was chosen based on the results of the 2006 iNACOL International survey. The country appears to be

at the top in the field of online learning because of its leadership in the following areas: current model of funding; technology integration; curriculum; and teaching practices in secondary online education.

Specifically, this study focuses on examining government policy for online education in these areas: student services; academic assessment; educational policy and administration; and marketing and public relations. Data were collected through artifact review and interviews with individuals familiar with the online learning initiatives within the New Zealand Ministry of Education and in the secondary classrooms and schools participating in online learning initiatives. The study explored the policies and processes that seem to be working the best and that seem to have required more attention and may have been dropped because they did not work.

Research Questions

The major research questions that guided this study are the following:

1. What are the nature and extent of e-learning (current model of funding, technology integration, curriculum, teaching practices, student services, academic assessment, educational policy and administration, quality assurances, teacher training, current trends, and marketing and public relations) in secondary schools in New Zealand from 1998 to the present?
2. What steps were taken for New Zealand's Ministry of Education to implement a system-wide online learning environment across the country?

3. What is working well and what are any unexpected benefits from the way New Zealand has implemented the online learning environment in secondary schools?
4. What is not working well and were any policies abandoned during the implementation of online learning in secondary schools?
5. What does the Ministry of Education want to do more of in relationship to online learning in secondary schools?

Significance of the Research

It is important to understand what is going on in the rest of the world, both to learn new techniques and to be stay competitive.

> One good example is worth a thousand theories. People do not change only when they must: They also change when they see that others - like themselves- have changed and flourished… People change as a result of what they notice, not just what they are told – especially when what they notice is someone just like them doing well" (Friedman, 2006, p. 565).

Identifying the current initiatives, overall components of online learning, and policies and practices in New Zealand, a country, which has years of success in this area, may provide a framework for e-learning leaders, stakeholders, and developers across the globe. This study may possibly identify policies and procedures to create new and adapt current online courses, schools, and programs that will provide students around the world with the best possible e-learning experience in order to be competitive.

Because New Zealand is farther ahead in online learning than most countries in initiating and sustaining e-learning with students in grades K-12, this paper will showcase

an in-depth study based on the New Zealand Ministry of Educations' initial response to the iNACOL survey. The data collected in this study will help to contribute to and extend the current research to aid current and future e-learning programs around the world based on how New Zealand is progressing with their implementation of e-learning.

Collecting and publishing research on e-learning initiatives in a country other than the United States may help to provide a roadmap for access to online learning for more students. Documenting the funding models, quality assurances, teacher training, course development, current trends, national policies, and other best practices in addition to interviews with Ministry of Education officials, school administrators, and teachers to find out what has worked well and what ideas they have abandoned over the years that did not work during the implementation may help other secondary schools and e-learning programs improve their current practices and policies as well as help new and future programs to build successful programs from the beginning.

Definition of Terms

1. *Asynchronous Communication* – Communication in which participants interact at various points in time (e.g., threaded discussions, e-mail, blogs, etc.)
2. *Blended Learning* – "Blended learning should be viewed as a pedagogical approach that combines the effectiveness and socialization opportunities of the classroom with the technologically enhanced active learning possibilities of the online environment, rather than a ratio of delivery modalities. In other words,

blended learning should be approached not merely as a temporal construct, but rather as a fundamental redesign of the instructional model with the following characteristics:

- A shift from lecture- to student-centered instruction in which students become active and interactive learners (this shift should apply to the entire course, including face-to-face contact sessions);
- Increases in interaction between student-instructor, student-student, student-content, and student-outside resources;
- Integrated formative and summative assessment mechanisms for students and instructor (Watson, J., Gemin, B., & Ryan, J., 2008, p.7).

3. *Course Management System (CMS)* – the technology/software in which online courses are developed and delivered.
4. *Distance Education* – Education in which the participants and/or the instructor is separated by physical space. (e.g., e-learning, online learning, videoconferencing, and correspondence courses)
5. *E-Learning* - Education in which instruction and content are delivered primarily via the Internet. Such online learning may include a range of Web-based resources, media, tools, interactivity, and curricular or instructional approaches. Internationally, a variety of terms are used to describe e-learning--including virtual learning, online learning, and electronic learning.
6. *Learning Management System (LMS)* – The technology/software solution for planning, delivering, and managing learning events within an organization, which may include both online classrooms and blended learning environments.

7. *Ministry of Education (MOE)* – The Ministry of Education guides and enforces education policy throughout New Zealand. The MOE is similar to the United States Department of Education.
8. *Online Learning* –Education in which instruction and content are delivered primarily via the Internet.
9. *"Online learning program* –An educational organization that develops and offers online instruction and content" (Watson & Ryan, 2005, p.1).
10. *Supplemental Online Program* – An online learning program where students enroll on a part-time basis to earn academic credit based on successful completion of the courses. Credit is issued by the supplemental program but awarded by the brick and mortar school in which the student is enrolled full time.
11. *Synchronous Communication* – Communication in which participants interact at the same time (e.g., telephone, face to face meetings, chat rooms, Voice over Internet Protocol (VoIP) software, videoconferencing)
12. *Virtual School* – An online learning program where students enroll and earn academic credit based on successful completion of the courses. Virtual schools enroll students on a full time basis.
13. *Whanau* – In New Zealand, whanau is a family consisting of the nuclear family and their blood relatives.

Assumptions and Limitations

All qualitative researchers approach their studies with a basic set of assumptions that guide their inquiries (Creswell, 1998, p.74). In this study, two assumptions with implications for practice were made going into the study. Limitations provide the potential weaknesses of the study related to the research methods of data collection and analysis (Creswell, 2003, p. 148). Three potential limitations with guidance to minimize them are discussed in this section.

The first assumption that was made involved the relationship of the researcher to the program being researched. "Qualitative researchers interact with those they study, whether this interaction assumes the form of living with or observing informants over a prolonged period of time or actual collaboration" (Creswell, 1998, p. 76). The researcher minimized the distance between herself and the people participating in the study. The researcher of this study is also actively involved in the field of K-12 online learning, working for a non-profit organization focused on K-12 online learning around the world. Working with governments and schools around the world to implement online learning, she was aware of her values and biases in the field in order to avoid voicing her interpretations in the study.

The second assumption of a qualitative case study is that responses from participants are accurate and reflect true feelings. During interviews, the researcher assumed the interviewee was answering honestly and providing accurate information to the interviewer. "Interview data limitations include possibly distorted responses due to

personal bias, anger, anxiety, politics, and simple lack of awareness since interviews can be greatly affected by the emotional state of the interviewee at the time of the interview" (Patton, 2002, p.306). This assumption also carried over to the collection of documents. The quality and completeness of documents also come into questions. "By using a variety of sources, the evaluator can build on the strengths of each type of data collection while minimizing the weaknesses of any single approach" (Patton, 2002, p.307). This triangulated approach to the study helped to ensure the integrity of the study and the assumption was made that all interview responses, observations, and documentation are accurate.

There were two limitations of conducting a qualitative case study. The first limitation was time and money constraints. The researcher was able to travel to New Zealand for two weeks, which provided her ample time to conduct face-to-face interviews with government officials, school administrators and classroom teachers. However, the ideal situation would have been to spend several months and observe the online process over time. This limitation of the researcher's time and money could have been beneficial to the end result as case studies have been known to be "too detailed or too involved for busy policy makers and educators to read and use" (Merriam, 1998, p.42).

A second limitation of case study research was the fact that the researcher was the primary instrument of data collection and analysis. The researcher is a new researcher and had to rely on her own instincts, formal education and abilities throughout the study.

There has been little discussion about how to construct the final report and analyze the collected data, and the training in observing and interviewing is limited. The researcher worked with members of her dissertation committee for guidance in these areas to ensure validity of the research.

The final limitation of this study was that the research is limited to one country and it cannot be generalized to other countries and situations. A key assumption of a case study is that "what works one place under specified conditions should work elsewhere" (Patton, 2002, p. 224). The size of the country and New Zealand's government structure provide a unique opportunity for a country-wide implementation of online learning, making it an ideal case to study. While some pieces of the study may be adaptable to other environments, a limitation of the study will be that it cannot be generalized to be a one size fits all solution for all countries.

Chapter II – Review of Literature

This chapter provides a summary of the literature found to be relevant to the proposed study. This review of the literature is organized into four major topics: (a) An International Overview of K-12 Online Learning, (b) history and geography of New Zealand, (c) history of the education system in New Zealand and (d) education technology and online learning in New Zealand's secondary schools. In the first topic, online learning is discussed, providing a summary of what is happening with K-12 online learning around the world. In the next two topics, New Zealand is outlined to provide a picture of the country and its history, also providing the history of the New Zealand education system. Next, a review of the literature available describing the current implementation of education technology and online learning in New Zealand will be discussed. Finally, a summary of e-learning initiatives in New Zealand will be shared. A summary is provided to synthesize the information provided and to connect the literature to the purpose of the proposed research.

An International Overview of K-12 Online Learning

Until 2006, very little research had been done on K-12 online learning in countries other than the United States. Then, the North American Council for Online Learning (NACOL), now known as iNACOL, wanted to learn what was happening around the world in this area. The organization sent a survey to over 100 countries across the globe to learn more about how others were implementing these new technologies in

learning. The survey was completed and returned from 15 countries with some amazing stories.

It was found that countries are embracing online delivery of education as a central strategy for enabling reform, modernizing schools and increasing access to a world-class education. China has digitized their entire K-12 curriculum and is working to train master teachers to teach online so that China can scale high-quality education through e-learning to 100 million students in the next ten years. Singapore shuts down their physical schools for one week each year to engage students in e-learning week. Mexico has digitized their entire K-12 content and curriculum and trains teachers in their universities to teach online, providing them with laptops. In 2008, the International Baccalaureate (IB) program began to offer the IB Diploma Programme Online, so that students in 125 different countries can interact with students from other countries, receive instruction taught by excellent teachers on a global scale, and increase access a world-class education. India is working on developing an internationally-benchmarked, digital, K-12 curriculum through the EduComp project, a private-public partnership, and at the same time, is working to develop a $100 laptop and new distribution model for education that is technologically-driven. South Korea has a national virtual school offering online courses. Turkey has scaled online courses to 15 million K-12 students in just three years through public-private partnerships. Changing models driven by blended and virtual learning is a key strategy for education reform and modernization globally.

The researcher has compiled the data from the iNACOL International Survey to show the key initiatives in K-12 online learning for each of the participating countries. The five countries highlighted in chapter two are shown below and a full table of all of the participating countries can be found in Appendix C.

Table 2

International K12 Online Learning Initiatives Based on the iNACOL 2006 Survey

	Overview of e-Learning	Extent of Adoption	Content	Teacher Training
Canada	*e-Learning initiatives at MOE (provincial) and/or District (local) program. *All provinces have made some progress. *Discussions around the collaboration of consortiums across borders. *Discussions around a national LOR. *Provincial consortiums lead by both provincial governments and organized at grassroots levels.	*E-Learning is in every province and most Boards. *In the Alliance, close to 4000 students taking full credit courses and about 1000 in blended delivery. *Across Ontario estimated 25,000 students taking online courses.	*Up until 2006 this was a local Board initiative except where Boards joined a consortium. *MOE online courses through their LMS – only available to teachers using MOE LMS for the delivery of full online courses. *Teachers within School Boards will continue to be the main drivers of curriculum development.	*Training is provided on the use of the tools by the Ministry and all other training is led by the Board *The Alliance Consortium trains teachers on online pedagogy and best practices through two conferences per year.

(continued)

Singapore	*Schools have the autonomy to decide how they want to implement the use of IT for teaching and learning, which includes online education. *An increasing number of schools have subscribed to learning management systems (LMS) from local vendors. A few have also developed their own system using the open source software, Moodle. *All secondary schools and junior colleges have an LMS. *Primary schools are also encouraged to have an LMS installed for teaching and learning.	*About 75% of the schools do have e-learning systems, and the percentage is rising as the remaining schools plan to come on board. This works out to about 400, 000 students who have at one time or another engaged in e-learning activities. *The main focus of Singapore's IT Masterplans is to develop teachers' capability and capacity to seamlessly integrate ICT into the curriculum to bring about engaged learning for our students. *At present, the number of students involved in e-learning depends on the content provided by the content providers. In some schools, the LMS is often used by students to access lesson activities or assignments from home.	*Private companies develop the LMS and content for schools which use the LMS and content on a subscription basis. *The Ed Tech Division within the Ministry also produces digital resources for e-Learning for subject areas where there is market failure or of strategic importance to Singapore. *Digital content is produced either in-house by a Media Production Unit or in collaboration with teachers and/or with industry or outsourced to industry. *Some schools develop their own digital resources.	*Teachers are trained on the use of IT for teaching and learning. *Schools can organize training for their teachers on the use of e-learning resources. *MOE has an online learning website "VITAL" for the professional development of teachers *Civil Service College also provides opportunities for teachers to learn online should they choose to do so

(continued)

	Overview of e-Learning	Extent of Adoption	Content	Teacher Training
United Kingdom	*Relatively widespread in the university sector, much lesson common in the school sector		*Government, institutions and faculty develop online content.	
United States	*Online learning is done at the state level; leaders of each state approve state, district, and school-wide e-learning programs. 24 states have state sponsored online schools and the majority of the other states are using e-learning in some form. *E-Learning programs have been created in several forms, such as: comprehensive schools, part-time programs, public, private, and charter schools, labs of students in brick and mortar schools taking online courses during the school day. *NACOL was established to serve as a resource to K12 virtual schools.	*Online course enrollments in K-12 virtual schools have grown by more than 30% each year for the past three years with over 600,000 total enrollments in 2005. *24 states have government sponsored schools and several school districts hundreds of school districts offer virtual schools/programs as reported in the "2005 Keeping Pace With K-12 Online Learning" report.	*Content is developed by corporate vendors, instructional designers, and content expert teachers *Digital Content can be purchased, leased, and developed within schools. *Several states, individual districts and schools have created online course development standards. *Courses are aligned to national, state, and district standards for quality control in the majority of online programs.	*Several virtual schools have developed their own training programs for teachers. *Companies sell training on the use of their course management systems and other software. *Training is also provided at regional and national conferences.

The facts listed above came from the 2006 iNACOL International Study and from updates provided to iNACOL over the last three years from various sources working in the field. The following section will summarize the literature, which is very limited, on what is happening in the area of K-12 online learning in Canada, Singapore, Turkey, United Kingdom and the United States, countries who have begun to do innovative things within the area of K-12 online and blended learning.

Canada. Education is a provincial government responsibility in Canada. "Across Canada, there are ten provinces and three territories" (Barbour & Stewart, 2008, p. 5), with each of these having their own Ministry of Education. Each of the provinces and territories have made progress in implementing online learning whether in the form of a province-wide distance education program, or through district and private school initiatives, but a national plan for online learning has not been developed (Powell & Patrick, 2006, p.5).

Provinces have taken the initiative to talk about the idea of collaborating and developing consortiums across provinces, but because of the different regulations for granting credits, nothing has come of these discussions. British Columbia is currently the only province "where the Government has created a specific regime to govern the operation of distance education" (Barbour & Stewart, 2008, p.5). The other provinces regulate distance learning programs the same as they do the regular brick and mortar schools. Funding is another obstacle in expanding e-learning in Canada, as it is provided

by the School Boards and Districts and nothing is provided at the provincial level, making it difficult to expand offerings and innovations (Powell & Patrick, 2006).

The first virtual school was developed in Ontario in 1994-1995, but did not start offering courses until two years later. The first online courses were offered in Ontario and Manitoba in 1995-1996 through a variety of district and school-based online learning initiatives and programs. Currently, Alberta and British Columbia have enrolled the most students in online learning through a variety of initiatives, and "every Canadian province and territory has some form of online learning" (Barbour & Stewart, 2008, p. 7) for K-12 students. Out of the countries that participated in iNACOL's International Survey, Canada is currently the only country with online learning developed across the entire country, where funding and regulations are provided at the local rather than federal level for education.

The federal government in Canada does fund federal education programs, especially those related to the implementation of technology. The federal government has provided funding for Internet access to the schools and general public, creating a national high-speed network, and increasing technology use for all students (Barbour & Stewart, 2008). The Ministries of Education in each of the provinces formed a council to collaborate on matters of common interest to each of the provinces and territories related to education policy.

Because of the inconsistency in policies for online learning it is difficult to determine the size and scope of implementation across the country. British Columbia is

the only province to have created policy around online learning, or as they have named it, distributed learning, and the province could be used as a model for the rest of Canada and other countries with a similar structure. School districts in British Columbia must sign a contract with the MOE to operate a distributed program. After the agreement has been signed, the distributed schools operate under their own set of policies. These programs are not limited to the traditional calendar year and students from other districts within the province are allowed to enroll in other distributed learning programs within the province as long as they are not taking away a seat from a student located within the process. Another innovation in the province's policy is that the per-pupil funding follows the student based on the way they choose to complete their coursework. For example,

> if a student is enrolled in six courses in their brick-and-mortar school and two courses in their district's distributed learning programme, then the school would receive six-eighths of the FTE [full-time enrollment] and the distributed learning programme would receive two-eighths of that FTE (Barbour & Stewart, 2008, p. 27).

A wide variation exists in the way online learning has been implemented and the number of students it serves in the other provinces. British Columbia's implementation and policy can be used as an example for other countries, as the policy supports the expansion of opportunities for students, rather than trying to limit them.

Singapore. Singaporeans must always be "in the know." They love to keep up with the latest technology, whether it is the Internet, cell phones, and any other twenty-first century technology that will keep them well-informed. Singapore has the highest rate of Internet users in Asia – 46 percent of all citizens over the age of fifteen go online every

month, while 53 percent of all households are connected to the Internet" (Baker & Baker, 2002, p.62).

Traffic is regulated by a sophisticated road-pricing system, where all cars have electronic devices in which the driver inserts a "cash card". An overhead gantry automatically deducts payment when the vehicle enters a restricted area such as shopping and business districts. Cash cards can also be used for daily activities such as grocery shopping, photocopies, and checking out library books. The country greatly encourages citizens to pay their bills online, and some businesses have even gone as far as charging extra fees if the bills are paid by check. Singapore plans to become a "cashless society" within the next few years.

In Singapore, people who do not know how to use computers usually have a difficult time functioning in their society because so many transactions depend on computer skills. Singapore is rapidly moving from a manufacturing and services based economy to a global, knowledge-based economy. The Science Hub is very similar to the United States' Silicon Valley. New and innovative products are created here, and scientists study the latest technology.

Singapore's 10-year iN2015 Masterplan was put into place to enable the country to be where it is today. Its goal was "to transform Singapore into a global city which exploits the potential of infocomm to add value to the economy and society" (Koh & Lee, 2008, p.87). The iN2015 plan covered all aspects of the country, including government and schools. It was said by the committee who created the plan that infocomm enables

"access to the latest knowledge and new learning resources; making learning come to life with multimedia and interactive elements; and creating an environment in which independent and life-long learning can take place" (p.88). The goals related to education in the iN2015 plan were to create a new learner-centric environment, to build a new nationwide infrastructure connecting schools, and to make Singapore the model for the innovative use of ICT in education and learning (Koh & Lee, 2008).

Schools have also embraced the use of technology in the nation's classrooms. "Information and communication technologies (ICT) competencies are incorporated in school curricula and as resources for teaching and learning" (Ai-girl, 2004, p.105). Before Thinking Schools, Learning Nation (TSLN), ICT was already being implemented in pilot projects across the country. Schools began using technology in the 1970s; however, "it was not until the early 1980s that the Ministry of Education made concerted efforts, through a series of projects, to enhance their application in every area from communication to administration to teaching" (Koh & Lee, 2008, p. 16). Computer Appreciation Clubs were introduced in secondary schools and at the Junior College level the first Computer Science course was introduced. The MOE also started the School Link Project, which connected all 360 schools on the island together and to the MOE and could be used for administration and communication needs (Koh & Lee, 2008, p. 16).

From 1990-1996, technology was implemented in a variety of ways through some pilots in selected schools. The Professional Computing Support Program was developed to begin equipping teachers with the knowledge and skills of using technology and

software for teaching and learning. Within these six years, two courses were implemented in secondary schools focusing on technology use in the workplace and providing basic computer skills, which required the MOE to put a computer lab in every secondary school (Koh & Lee, 2008).

The four ICT related projects were focused on computer-assisted instruction in mathematics classrooms. This software supplemented math textbooks and focused on drill and practice and problem solving skills, and it provided immediate feedback to the student. The Internet in Schools Project was a mentor-based project that provided technical support in using the Internet for schools. Principals were also brought together at this time to be "made aware of the critical issues when linking their school to the Internet through sharing sessions and discussion panels conducted by Internet pioneers" (Koh & Lee, 2008, p.19). The final piece of this pilot was setting up the MirrorS site, which was rich education content that both teachers and students could access from school or home. Primary Schools participating in the Accelerating the Use of ICT in Primary Schools Programme (AITP) used ICT in their classrooms to teach on average 10% of the curriculum using CD-ROMs and software. The Students' and Teachers' Workbench (STW) took the two science courses at the secondary level and developed a content repository of resources for them. Up until this point, the Internet use in schools had been reserved for administration and teachers. This final project helped create the first phase of Singapore's Masterplan for ICT (Koh & Lee, 2008).

As part of the MOE's TSLN vision in 1997, a Masterplan for ICT was also introduced. The philosophy of these plans is that education should constantly anticipate the needs of the future and help prepare students to meet these needs (Singapore Ministry of Education, 2009). Not only did the plan want to provide broader access to instructional technology to a larger base of students, it was "hoped that the new 'learning connection' to be provided will assist students in developing the perspectives required to work and live in an increasingly borderless world (Towndrow, 2001, p.24). The Masterplan would be implemented into the education system in three phases: Masterplan I from 1997-2002, Masterplan II from 2003-2008, and Masterplan III from 2009-2014.

2 billion Singapore dollar was invested in the first Masterplan "to introduce ICT in schools and to have pupils spend 30 percent of curriculum time learning with, or through, computers" (Goh & Gopinathan, 2008, p.33). The investment of "funds were designated to purchase computers, full networking of the schools, physical renovations, software and courseware, and teacher training" (SeokHoon, 2003, p.284). An additional 6 million Singapore dollar per year was to be used to replace and maintain hardware, training teachers, and to develop new digital resources for schools. In the first Masterplan, ICT would be integrated in to all aspects of the education system including the "curriculum, assessment, pedagogy, professional training, and culture" (Goh & Gopinathan, 2008, p.33) in order to fulfill the vision of TSLN.

The key information from the MOE was integration, they did not want the computers to replace the teacher, but it was to be used as a tool to support teaching and

learning. In the first phase of the plan, "the objective of integrating IT into the curriculum is to promote independent learning and critical thinking, what seems to be a central preoccupation is computer competence, rather than the use of IT as a critical skill" (Koh, 2004, p.339). Students were to learn the basic skills of using a computer, such as word processing, designing web pages, searching the Internet, etc. rather than developing their "understanding of IT as a critical social practice" (Koh, 2004, p.339).

With the introduction of the first plan, the Educational Technology Division of the MOE was created in order to take the lead on the implementation of the Masterplan. The EdTech Development, Infocomm Technology Training and Media & Infrastructure Support branches made up this new division. The EdTech branch was responsible for researching and recommending new advances and innovations in education technology that could be integrated into Singapore's curriculum. The role of the Infocomm Technology Training branch was to implement the technology in the schools and assist teachers in using it in their classrooms. The final Media & Infrastructure Support branch was responsible for the planning of the physical infrastructure of the technology (Koh & Lee, 2008). This division worked together and secured outside partnerships within the MOE and in the corporate world to design, develop and implement the nation's Masterplan for ICT.

The first Masterplan identified four goals of the education system in order to successfully implement the plan, which included:

- Curriculum and Assessment.

- Content and Learning Resources.
- Physical and Technological Infrastructure.
- Human Resources Development (Koh & Lee, 2008, p.31).

The curriculum had previously focused on teachers dispensing information to students to memorize, where the new shift was in evaluation, application, and synthesis of information. The MOE recognized a need to not just pile these new skills on top of the curriculum that was already there, and reduced the curriculum by 25% to allow for the integration of ICT skills. Also, "150 out of 162 syllabi were revised to align them with the objectives of the Masterplan for ICT in education and other key MOE initiatives for enhancing learning" (Koh & Lee, 2008, p.32).

The new ability to use ICT tools in education provided the ability with students and teachers to collaborate with other students and teachers from around the world as well as providing them access to experts and new learning environments that students might otherwise have ever seen. SEAMO (Southeast Asian Ministers of Education Organisation) countries, United Kingdom (UK), Chile, Canada, Finland, and Japan set up MOUs for collaborating on projects throughout the school year (Koh & Lee, 2008). Field experts in science and math also worked with students via the Internet by providing knowledge and access to tools from their field that schools may not have access to.

The MOE and its corporate partners also created content and learning resources for teachers and students across the country as part of the first Masterplan. A central clearinghouse of recommended software and the Internet Resource Website, which

recommended websites for teachers, were created for teachers to easily find and integrate new technologies into their curriculum. The Educational Software Procurement Scheme (ESPS) was developed to assist schools in obtaining these recommended software and other resources at an "average of 30-40% lower than the retail price" (Koh & Lee, 2008, p. 37).

The physical and technical infrastructure was a necessity for implementing the Masterplan for ICT in education. The two areas of focus for this goal of the plan were to provide:

- "students with access to infocomm in all learning areas in the school;
- a school-wide network to link all schools through the Wide Area Network, to be eventually connected to Singapore ONE, enabling high speed delivery of multimedia services on an island-wide basis" (Koh & Lee, 2008, p.42).

Schools were provided with standards for the infrastructure, but it was up to them what they would purchase and when, as long as the standards were met by 2002. The standards included "a pupil-to-computer ratio of 6.6:1 in primary schools, and a ratio of 5:1 for secondary schools and junior colleges. Teachers were equipped with notebooks, and the ratio of teachers to notebooks is 2:1" (Soh, 2001, p.22).

Every school was also provided with its own school-wide network and was linked to the Wide Area Network. "Singapore ranked second in the world, after Finland, for the availability of Internet access in schools" (Koh & Lee, 2008, p.44) in the Global

Competitiveness Report 2001-2002 based on the connectedness provided by the high-speed backbone of Singapore ONE. With all of the schools connected, communication and access to data was seamless through email and school Intranets and the Internet.

The final goal of the first Masterplan was in the training of leadership and the teachers. This had to be done not only at the MOE and school level, but in higher education as well. Teachers were to be trained in basic skills of ICT and how they could be used in the classroom with students. "Every in-service teacher in Primary and Secondary schools went through 30 hours of core training" (Koh & Lee, 2008, p.47). Training was done face-to-face and was subject-based for secondary teachers and more general for the primary school teachers. Like the full implementation of the plan, training was done in three phases and a total of 24,000 teachers were phased over the five-year implementation of the first Masterplan. Sixty additional teachers who were strong in pedagogy and showed a high level of interest in technology were identified and given additional training to become Senior Infocomm Technology Instructors who trained the remaining teachers in schools across the country (Koh & Lee, 2008). Continuous training was offered both in online face-to-face courses to provide ongoing support for the teachers.

Pre-service teachers also needed to be trained on the vision of the MOE and how to implement it in the schools. The teacher training university, NIE, aligned their programs with the Masterplan to prepare all of the incoming teachers. The school hired an outside vendor to do the initial 12 hour training and teachers also held online

discussions on what they had learned in these lessons and in their practicum teaching experiences in the schools. More advanced courses were later developed by the university and master degree programs were created in ICT to encourage in-service teachers to learn more about how to use ICT in their classrooms.

Singapore considered the first Masterplan implementation to be a success in laying a foundation for the future. Students were surveyed and it was found that they felt prepared and had the skills to develop ICT-based projects. All schools had been provided with the infrastructure to support ICT in the schools and teachers had acquired the necessary knowledge and skills to implement ICT into their curriculum (Koh & Lee, 2008). The experiences from the Masterplan I for ICT in education provided new models and direction for the next phase, the implementation of Masterplan II.

After the end of the first Masterplan, "Singapore has been able to take full advantage of the information revolution due to its advanced computer, Internet and Social structures" (SeokHoon, 2003, p.284). The first phase of the Masterplan was successful in that because of the small size of the country, it was easy to communicate its vision to the schools and it was fiscally aware and used its resources wisely. The foundation had been laid and the infrastructure and basic ICT skills and how to integrate them into the curriculum were taught to teachers. From 2003 – 2008, Masterplan II was implemented. It was "designed to build on the many achievements of mp1 and take ICT integration in the education system to an even higher level" (Koh & Lee, 2008, p.59).

The second phase of the plan would be for schools and teachers to achieve the

baseline of ICT in schools, to provide teachers with additional resources to be innovative, to use ICT to help differentiate instruction, and to prepare students with the 21st century skills needed to be a productive citizen of Singapore. "The second Masterplan had the following six outcomes:

- Students use ICT effectively for active learning.
- Teachers use ICT effectively for professional and personal growth.
- Connections between curriculum, instruction and assessment are enhanced using ICT.
- Schools have the capacity and capability to use ICT for school improvement.
- There is active research in ICT in education.
- There is an infrastructure that supports widespread and effective use of ICT" (Koh & Lee, 2008, p.60-61).

In order to achieve these outcomes, Curriculum and Assessment, Professional Development, Capacity and Capability Building, Research and Development, and Infrastructure and Support were the five areas identified to implement Masterplan II.

At the start of the Masterplan II, the MOE's Educational Technology Division's role changed to become "the champion and catalyst in using technology to enhance educational processes and to establish Singapore as the leading centre for ICT in education" (Koh & Lee, 2008, p. 61). This division was re-structured to two branches,

one focusing on researching and identifying new technologies and pedagogies and the other focusing more on professional development and building schools' capacity to integrate technology into the curriculum. The division continued to build and foster relationships with other divisions within the MOE and community.

New technologies and resources were developed to strengthen ICTs integration into the curriculum and assessments. In 2005, basic ICT skills standards were developed for primary, secondary, and Junior Colleges to provide benchmarks to ensure students mastered the ICT skills needed to prepare them for their future. The MOE implemented the standards in two phases, starting with primary schools in 2007 and Secondary schools and Junior Colleges in 2008 (Koh & Lee, 2008). The standards ranged from students learning basic word processing and multimedia tools to using more complicated technologies such as data-loggers to collect data for various subjects. Strategies and ideas for teaching these skills were integrated into textbooks and learning guides were also developed for teachers.

A shift from CD-ROM based content to digital resources was seen in Masterplan II to provide anytime, anywhere access for students and teachers. "In 2003, MOE implemented the Rich Digital Media Content (RDMC) project to pilot test the development of such resources" (Koh & Lee, 2008, p.65). The MOE developed and contracted vendors to build these resources initially, but then led workshops for teachers on how to create and share their own learning objects. All of these resources were uploaded into Singapore's edu.MALL portal for teachers to easily search access and

customize resources and learning to meet the needs of their individual students.

Professional development continued to play an essential role in the implementation of the country's Masterplan. School leaders and teachers continued to be at various skill levels in their knowledge and ability to implement ICT. "Mass customization of programmes was adopted to cater to the differing needs of teachers, such as skills to integrate the baseline use of ICT (e.g. use of Internet), or higher levels of ICT use (e.g. use of discussion forums)" (Koh & Lee, 2008, p.66). Professional development was delivered in a variety of ways including face-to-face workshops, online courses, lectures, camps, etc. and was customized to meet the individual teacher's needs either through one time workshops, conferences, just-in-time training, university degree programs, or through ongoing trainings.

Training "focused on the value-added use of ICT in the teaching and learning process, instructional design for resource development as well as the planning, monitoring, and reviewing of department ICT programmes" (Koh & Lee, 2008, p.67). Teachers are given time to take courses, plan and design lessons, and to collaborate with other teachers. Communities of Practice were encouraged to start after face-to-face trainings in order to foster the relationships built in the course and to continue the sharing of resources and ideas beyond the training. Professional Development Guides were developed by the MOE to assist teachers in identifying the skills they need to integrate ICT and to help them in planning their own professional development program to obtain that knowledge. In 2006, the One-stop Learning and Resource Portal was created "to

consolidate efforts by different parties in MOE to promote learning and professional development, minimize duplication of such efforts and resources utilized, and maximise return on investment" (Koh & Lee, 2008, p.67). The MOE's investment in professional development and support of their teachers shows they understand how important the teacher is in implementing their vision of an ICT literate population.

The infrastructure implementation and technical support was all overseen by the MOE in the first phase of the plan. Schools had the flexibility to choose and purchase the hardware and software to meet the needs of their students. "With schools at different levels of ICT implementation and given greater autonomy, they needed support which was provided by ICT Consultancy Teams formed in 2004" (Koh & Lee, 2008, p.69). The goal of these teams was to help schools build capacity in planning and using ICT in education. The teams were made up of both education and technological professionals to assist schools in a variety of ways such as experimenting and integrating new technologies, learning environments and pedagogies to promote ICT literacy.

Within phase two implementation, schools were now required to self-assess their own ICT practices. The MOE developed the Benchmarking Your IT Practices for Excellence in Schools (BY(i)TES) assessment to help schools review and improve on their implementation of ICT. The form was revised several times with the input of the schools and narrowed down to three domains "Leadership and Culture, Student Use, and Teacher Use" (Koh & Lee, 2008, p. 70). The self-assessment tool provided schools with a roadmap to assess the strengths and weakness of their plan and allowed them to create a

plan to make their programs better.

In 2003, a Research and Development branch was formed within the Educational Technology Division of the MOE and in 2005, the National Institute for Education (NIE) created the Learning Sciences Labs (LSL). These groups were designed to experiment with emerging technologies and pedagogies and to make recommendations to schools and teachers on what and how to implement them in order to meet the needs of each student. Action research and experimentation of these new findings was also encouraged at the school level as well for the first time in a new group of "Incubator schools". This program started with one primary and one secondary school to experiment with Tablet PCs and new environments for teaching. By 2008, 68 schools had become incubator schools, or LEAD ICT (the program was later renamed) and

> could focus on either research in the use of emerging ICT-based pedagogies such as studying the effect of multimedia use in the teaching of Chinese Language, or practice-based efforts such as use of video and podcasting by students for language learning and use of data loggers to study the effects of environmental destruction (Koh & Lee, 2008, p.72).

These schools were closely watched for what working that could be implemented in other schools and what types of technologies were not appropriate for educational usage.

The final area of focus on the implementation of Masterplan II was on the enhancement of the infrastructure and support. The first plan provided schools with a basic infrastructure, but the second plan focused on providing schools "with an enhanced ICT infrastructure that could facilitate different modes of lesson delivery of and support varied learning, that is, one that could support an undisrupted delivery of powerful

multimedia and full interactivity of instructional content" (Koh & Lee, 2008, p.73). The continued support for this new ubiquitous learning environment was essential. Baseline bandwidth of 5Mbps was provided to schools, with the eventual goal of connecting all schools at one Gigabit per second or more (Koh & Lee, 2008). Computer ratios for students went down to 6.5:1 for Primary Schools and 4:1 for Secondary schools and a new focus of providing computer and Internet access for high need students began. "In 2006, 12% of households with school-going children did not have access to an Internet-read personal computing device" (Koh & Lee, 2008, p.75). The Infocomm Development Authority (IDA) of Singapore collaborated with their industry partners to offer more than 19,000 families Internet ready computers and unlimited broadband access for less than 300 Singapore dollar (Koh & Lee, 2008).

The need for support continued to grow. Each school was still provided with an on-site Technology Assistant and access to the central technology help desk, through funding from the MOE. In addition to this support, "MOE also provided an option for schools to purchase additional technical services form a list of Professional Support Services (PSS)" with their ICT funds.

> In 2008, schools received additional funding for an ICT Executive as part of their ICT Grant and have the autonomy to decide on whether to use the funds to engage ICT Executives for their schools, or on other ICT services (Koh & Lee, 2008, p.75).

This executive's role is to provide technical support and professional services for planning and implementation of ICT in the schools.

As the implementation of phase two of the Masterplan ended a year ago, data on

the success of the implementation is not available; however, a few achievements have been noted. Students and teachers were surveyed and feel they are competent in basic ICT skills and are able to use the Internet and email and two-thirds of teachers feel comfortable supplementing the curriculum and their teaching with ICT tools. 80% of schools have met the Masterplan II outcomes and 15% have exceeded them (Koh & Lee, 2008). "The ultimate goal of the second Masterplan is not about the use of technology, but rather about changing the culture of the classroom and school to support and motivate thinking and independent learning among young students" (SeokHoon, 2003, p.287). As this goal has not yet fully been reached, the continued efforts, participation, and collaboration by teachers, principals, and MOE are continuously working to make this a reality with the recent creation of a third Masterplan.

The third phase of the Masterplan is still being developed; however, the MOE website, does provide a preview of the goals of the plan to continue the implementation of ICT in education from 2009-2014. The third Masterplan continues the vision of the first two phases of the plan of equipping students with 21st century skills to succeed in a knowledge-based economy.

The Singapore Ministry of Education's website (2009) states that, "The broad strategies of the third Masterplan for ICT in Education are:

- To strengthen integration of ICT into curriculum, pedagogy and assessment to enhance learning and develop competencies for the 21st century;
- To provide differentiated professional development that is more practice-

> based and models how ICT can be effectively used to help students learn better;
>
> - To improve the sharing of best practices and successful innovations; and
> - To enhance ICT provisions in schools to support the implementation of mp3."

The MOE is continuing to focus on the areas of Curriculum and Assessment, Professional Development of its leaders and teachers, Research and Development, and the continuous upgrade and implementation of new technology infrastructures in schools.

Extending the ICT deeper into the curriculum and pedagogy by providing richer opportunities for students to use the technology to communicate and collaborate and for researching, analyzing and synthesizing information. New Web 2.0 tools also allow both students and teachers to now create content for the Internet. The infrastructure goal is to provide every student with a notebook computer and to give schools faster Internet connections in order to allow each student to meet these curriculum goals.

More teachers will be trained as "ICT specialist teachers" to continue training teachers across the country "about effective teaching practices that incorporate ICT use in the classrooms to achieve desired learning outcomes for their students" (Singapore Ministry of Education, 2009). The MOE also hopes to continue to grow their LEAD@ICTSchools and FutureSchools@Singapore programs that began during the previous two phases of the Masterplan, which allow schools to try more experimental technologies and pedagogies with students. Also,

> to improve the sharing of best practices, MOE will support the establishment of a network of educational labs where innovations can be prototyped and tested.

> These labs will provide the latest technologies to promote exploration of learning possibilities. They can also serve as training ground for pre- and in-service teachers (Singapore Ministry of Education, 2009).

Singapore still has a national curriculum and examinations, but the schools are gaining more and more freedom in using and developing their own resources for educating students in a variety of ways to meet each child's different needs.

E-Learning in Singapore's secondary schools. With the investment in an infrastructure, training, and support for Singapore's schools, e-learning is a natural fit in the education system. With the autonomy for schools to decide how they want to implement the use of ITC for teaching and learning, several have chosen online and blended learning approaches.

> According to Dr. Koh Thiam Seng, Director of Educational Technology Division, 'with iN2015's push for ubiquitous computing, broadband access and 1:1 computing will become commonplace and pervasive in Singapore. The future of learning and education is going to be browser-based, multi-device and mobile…I expect that learning will be accessible anywhere, anytime, and through any device (Koh & Lee, 2008, p.88).

The MOE's vision is that "schools will become highly connected learning hubs which will seamlessly tap external resources, specialized knowledge and expertise from different agencies, organizations and communities at the local and international levels" (Koh & Lee, 2008, p.89). All of these things lend well to the expansion of online and blended learning environments in Singapore's schools.

The infrastructure and content has been implemented and developed for primary and secondary schools and Junior Colleges through the Masterplans for ICT in education. "As of November 2006, all (100%) of secondary schools and junior colleges and 134

(85%) of primary schools (grades 1-6) are using an LMS [Learning Management System] for teaching and learning" (Powell & Patrick, 2006, p. 18). The MOE has also developed and purchased several digital content resources that are located in their web-based portal, edu.MALL that was created out of the Masterplans. As part of the professional development in the first two phases of the Masterplan, teachers were trained to integrate these resources into their teaching as well as taught how to build and share their own resources, in which they have uploaded and shared over 12,000 digital resources from May 2005 – November 2006 (Powell & Patrick, 2006).

The schools that are offering online courses to their students are focusing on the core subject areas using curriculum that is provided by curriculum design companies or their own teachers, or they are using a combination of both. The schools providing full online courses offer them during the school day in the school computer lab (Powell & Patrick, 2006). In 2006, 500 million Singaporean dollar was given to fund a research project to support "Singapore's long-term vision of growing into a global interactive and digital media (IDM) capital that will fully leverage the Web 2.0 space" (Koh & Lee, 2008, p.89). The MOE wants to take education into the next generation of technologies and pedagogical practices by prototyping and studying educational gaming, virtual worlds for learning such as Second Life and by studying today's students to gain a better appreciation of how to develop content to engage them in learning.

Blended learning environments, which are becoming more popular around the world, is the majority of the way online learning opportunities are providing for students

in Singapore. The schools mix online curriculum with face-to-face instruction; "however, students in some schools can purchase a personal subscription to the content in order to access the content from home" (Powell & Patrick, 2006, p. 18). The majority of the students doing this use the money they get from the Edusave Grant from the government.

The most innovative idea gleaned from iNACOL's International Survey was the idea of e-Learning week.

> A number of schools in Singapore have adopted e-Learning week, where students do not attend school but stay at home working on lessons and assignments delivered through the learning management system. During this week, teachers facilitate the learning and provide feedback via email and other electronic means (Powell & Patrick, 2006, p. 19).

E-Learning week started with one secondary school and junior college in 2005, and has now expanded to multiple secondary schools, junior colleges. The idea was taken from Raffles Institute, who has been doing e-learning week since 1999. In 2006, the idea of e-learning week had become so popular they phased it out and is now integrated into the curriculum on a full-time basis.

According to the MOE's response to the iNACOL International Survey, e-learning enables teachers "To incorporate technology into learning and is a creative avenue for students to express themselves" (Powell & Patrick, 2006, p.19). Students can work on difficult concepts at their own pace, using a variety of methods and tools and can communicate and learn from their peers in online discussion forums. The teachers' biggest challenge in using online learning has been "the time spent on designing e-

learning packages" (Powell & Patrick, 2006, p. 19); however, when asked, the students found the online content engaging and enjoyable making it worthwhile to the teacher.

Generally, private companies develop the LMS and content for schools and provide it to them on a subscription basis; however, a few students at the Chinese High School

> produced Electronic Link Forum, communications software that includes e-mail, group messaging, file sharing, and other features. The boys drew up a business plan and are now negotiating with the Education Ministry, which may buy the software, according to school officials" (Borja, 2004, p.33).

This is just one of example of what can happen when ICT and project work are combined. Currently, most education is learning about something and the MOE says, "in the future, it would be equally important for students to experience "learning to be" entrepreneurs, designers and programmers through participation in the niche communities" (Koh & Lee, 2008, p. 91), which is exactly what these students were able to experience.

Partnerships have been essential to the implementation of the Masterplans and have grown into other projects. "The Information Technology Standards Committee (ITSC), an industry partnership supported by SPRING Singapore, and Infocomm Development Authority of Singapore (IDA) has developed a Specification for e-Learning Framework" (Powell & Patrick, 2006, p. 21), which provides standards for e-learning, including approaches to developing courseware for different environments. The partnership is also in the process of developing Content Exchange Metadata Standards (CEMS) and Taxonomy Standards for education in hopes that everyone, commercial and

the MOE will use the same language for the development of content in order to easily distribute and exchange the resources (Powell & Patrick, 2006).

The country has developed the edu.MALL to host a variety of digital content. Content within this clearinghouse will have to meet all of the standards in order to be shared across the country. “Singapore is currently looking into a framework for the development of digital content, including e-Learning resources. It will provide a set of guidelines to facilitate and ensure the development of quality digital content by commercial vendors” (Powell & Patrick, 2006, p. 21). Teacher resources are also provided within edu.MALL. Teachers can locate pedagogically sound resources for their on demand learning needs.

Costs of training teachers, upgrading and implementing new technologies, and ongoing subscription costs are the main obstacles in implementing online learning for all students (Powell & Patrick, 2006). As stated earlier, low-income families are provided low-cost computers with unlimited broadband Internet access, so access to the technology is not an obstacle for Singapore, unlike in most countries that participated in the International survey. Other technologies, such as “Tablet PC’s, dataloggers and handhelds with wireless connectivity” (Powell & Patrick, 2006, p. 22) have also been implemented to change the experience of how students learn, also make the transition to learning online and in a blended environment much easier.

“Online learning is increasingly adopted by schools as part of their learning process. Project work and the shift to a more learner-centered approach have encouraged

independent learning among students" (Powell & Patrick, 2006, p.22). With the one to one laptop initiative being phased in as part of the third Masterplan, online learning is only expected to expand in Singapore. Other approaches the MOE is considering to expand online learning include the use of an Open Source LMS, incorporating a Learning Activity Management System (LAMS) into the schools' LMS', the development of a learning object repository and the expansion of WebQuests in the curriculum (Powell & Patrick, 2006).

Online learning is a key initiative in Singapore's education system. It is continuing to advance and students are using Web 2.0 tools, digital content, virtual worlds, and mobile devices to access content through the Internet. Singapore sees the FutureSchools as the schools that will be the frontrunners in the expansion of these new technologies and how they can be infused into the curriculum. Within

> the iN2015's vision of ubiquitous computing, and the use of IDM [Interactive and Digital Media] in the future, it is imperative for schools and teachers to re-conceive how learning can be more inclusive of students' experience, interests and passions which occur outside the school environment, and more importantly, to reconnect learning within the broader learning ecosystem" (Koh & Lee, 2008, p.93).

Blended and online learning environments are tools that allow teachers to easily differentiate learning in order to provide a customized learning experience to ensure students are engaged in learning.

Turkey. Turkey has gone from offering no online course options for students to enrolling over 16 million students from grades four to the university level in less than three years (Gozaydin, 2008). In 1995, prominent businesspeople set up 40 learning

stations that were equipped with computers, CDs and Internet access in the most remote areas of Turkey to start the implementation of e-learning (Powell & Patrick, 2006). Teachers were unable to go to these areas due to terrorism and these learning stations allowed local students to access teachers and an education that would not otherwise have been possible without online learning.

In September 2006, a new nation-wide education initiative was announced by NGOs (Non-government organizations) to provide online learning opportunities for students in grades 1-8. The "Online Big Project" would provide "20 software- and simulation-based online courses for grade 4-8 students in Turkish, Math, Science, and Social subject areas for $20 million, which was funded by a private businessman" (Powell & Patrick, 2006, p.24). Each course is aligned to the national curriculum standards and was meant to be implemented into a blended environment. During the pilot year, over 200,000 elementary students were able to access these courses and within three years of the implementation, over 11 million elementary and secondary students were given access as reported in the iNACOL study.

Teacher training was also important to the implementation of e-learning in Turkey. Funding was provided for an estimated 50 private companies to train the 600,000 teachers across the country (Powell & Patrick, 2006). Courses are reviewed on an annual basis to ensure curriculum alignment, but according to the iNACOL study, standards for e-learning have not been adopted in Turkey to review the quality of the delivery and design of the courses.

The Ministry of Education has shown support of this initiative by providing a student computer ratio of 20:1 as well as broadband Internet connections for each school (Powell & Patrick, 2006). Corporations are working to lease and purchase Intel laptops at a cost of $10 per month for families and are working to purchase one million per year to support the initiative (Gozaydin, 2008). "Schools have taken the initiative to develop their own courses, while others have purchased content from the private companies. The private businessmen have fully funded the K-12 endeavors due to formalities in the law" (Powell & Patrick, 2006, p.24).

Turkey has been paying close attention to MIT's open courseware model and believes this is a future trend in e-Learning, and is working to create international partnerships to build "international courses in mathematics, science, and social studies to be offered to students all over the world at no cost" (Powell & Patrick, 2006, p.24).

United Kingdom. "E-learning in the United Kingdom is relatively widespread in the University sector but is much less common in the K-12 school sector" (Powell & Patrick, 2006, p. 25) at this time. However, they have created an e-strategy for the K-12 schools to implement online learning across the United Kingdom in the next ten years. "The e-Strategy was designed to harness technology to the needs of children, learners, parents, teachers, careers, employees, and all of their stakeholders (Powell & Patrick, 2006, p.25). Within five years of the implementation of e-Strategy their goal was to implement ICT strategies to educate students in using technology. Within ten years of implementation, they want to "build on the capabilities of their newly skilled workforce

in order to become more ambitious and innovative" (Powell & Patrick, 2006, p.25). The six areas of focus for the United Kingdom's e-Strategy included:

- "creating an integrated online information service for all citizens;
- integrating online personal support for children and learners;
- building a collaborative approach to transforming teaching and learning
- developing a quality training and support package for practitioners;
- building a leadership and development package for organization capability in ICT;
- to create a common digital infrastructure to support transformation and reform" (Powell & Patrick, 2006, p. 25).

Although e-Learning is still fairly new to K-12 students in the United Kingdom, they have also taken an innovative approach to providing content to other countries. Where Turkey sees the promise of Open Educational Resources (OERs), the United Kingdom sees education as an export with the availability of e-learning tools and digital resources. "Education and training are increasingly being seen as an important export market – with a report last week claiming that it was earning more for the UK economy than financial services or the car industry" (British Broadcasting Corporation [BBC], 2007). The UK's LP+ group signed a deal with a group in China to build an online learning system and online courses for secondary students in China. The courses will be offered to secondary school students in over 20 cities in China. With this new deal, "education exports were worth £28bn, an increase of 39% in two years" (BBC, 2007).

The United Kingdom may not be a current leader in implementing K-12 online learning initiatives, but it has become a leader in the development and sales of content and services for K-12 online learning in other countries.

United States of America. Since 1996, K-12 online learning has been growing at an average rate of 30% annually across the United States (iNACOL, 2009, p.1), and according to the Sloan Consortium (2009), the overall number of K-12 students engaged in online courses in 2007-2008, is estimated at 1,030,000. Online learning is implemented at the state level, similar to Canada's e-learning initiatives. According to the 2008 Keeping Pace annual report, 44 states have significant supplemental online learning programs, or significant full-time programs (in which students take most or all of their courses online), or both. Of the states that do not have either of these options, several have begun planning for online learning development (Watson, J., Gemin, B., & Ryan, J., 2008).

Online learning in the United States has been implemented through blended learning classrooms and schools, district and state-wide supplemental online programs, full-time cyber charter schools, private schools, University operated K-12 programs, consortiums of districts, and by non-profit and for-profit companies, providing for a number of students with different needs. Students can access a variety of online courses and services through online and blended learning such as: Advanced Placement and International Baccalaureate courses; dual enrollment courses in partnership with higher education institutes; expanded options for core courses in mathematics, science, and

foreign languages; remediation and/or credit recovery for struggling students who may need multiple pathways to personalize instruction. Other students may enroll in online courses and schools because of the need to secure employment, special needs, the lack of access to courses in their district (rural communities), teen pregnancy, the need to travel (military families, athlete, actors, etc.), and for students who are homebound because of medical issues; however, the number one reason for offering courses at a distance was "the course was otherwise unavailable" as cited by 80% of K-12 school districts (U.S. Department of Education National Center for Education Statistics [NCES], 2005).

E-Learning also provides a competitive education for all students by personalizing instruction, improving educational achievement through use of real-time data to inform instruction, and it provides highly qualified teachers to any school and can help increase graduation rates by providing multiple pathways for students to succeed. Two states have also seen the need to develop 21st century skills in their students and are now requiring students to complete an online course as part of the high school graduation requirements in Michigan and Alabama (Watson, J., Gemin, B., & Ryan, J., 2008).

Online learning – the delivery of high-quality online courses – is considered by innovation expert and Harvard Business School professors Clayton Christensen, Michael Horn and Curtis Johnson (2008) as the most important "disruptive innovation in K-12 education." To summarize his recent book, *Disrupting Class,* online learning provides access to courses otherwise unavailable and creates a new distribution model to access highly qualified teachers in locations where there may be severe teaching shortages.

Importantly, e-learning requires a significant shift in the teaching and learning paradigm - away from the old Carnegie model of seat time toward a new, computer-mediated model, shifting time, types of resources and instructional support (Christensen, C. M., Horn, M. B., & Johnson, C. W., 2008). Christensen, et. al. also predicts that, "data suggest that in about six years 10 percent of all courses will be computer-based, and by 2019 about 50 percent of courses will be delivered online" (2008, p.98)

Virtual schools, both blended and online learning are creating new models for delivery and design of curriculum, instruction and assessment in K-12 schools in the United States. For example, online programs are implementing performance-based models, which use real-time data to track student progress. Online courses can provide flexibility for using school time differently, allowing for acceleration of student learning and additional instructional support and time for struggling students. Online course design varies in the use of technological and teaching approaches across the United States – including facilitation of robust online discussions, the use of project-based learning, collaborative learning, gaming, working in virtual worlds, simulations, artificial intelligence, and cognitive tutors embedded in course design. The instructional models vary in pedagogical approaches for enhancing teacher-student interactivity, student-student interactions, and student-content interactions.

According to *A Synthesis of New Research in K-12 Online Learning*, the primary reason that school districts offer online courses is to expand options for students. The study reports, "the first impetus to the growth of K-12 distance education was an interest

in expanding educational options and providing equal opportunities for all learners." The online course was otherwise unavailable at the school. A literature review in the *Synthesis* showed that online learning is effective, or as the study explains it is "equal or better" than traditional face-to-face, lecture courses when based on student achievement. It reported, "one conclusion seems clear: On average, students seem to perform equally well or better academically in online learning." The third major finding was that training teachers to teach online "improves teaching" in online and face-to-face settings. These implications for online training to improve teaching strategies overall are an important finding: "teachers who teach online reported positive improvements in face-to-face, too. . . . Of those who reported teaching face-to-face while teaching online or subsequently, three in four reported a positive impact on their face-to-face teaching" (Smith, R., Clark, T., & Blomeyer, R., 2005).

Initiatives to train pre-service and in-service teachers to teach online and to use and create digital resources in both their face-to-face and online courses are lacking in the United States. A small number of universities provide degree programs, which assist teachers in mastering these skills. Universities have been quick to adopt online learning as the Sloan Consortium (2008) reports that there are approximately 4 million college students are currently enrolled in fully online courses in 2008; but the teacher education programs have not taken the lead to train teachers to teach in an online environment. The State Departments of Education in California and Georgia have taken the lead and provide training for teachers to teach online. Boise State University has also partnered

with a national online school provider to provide the training for all of Connections Academy teachers. The majority of online learning programs and schools in the United States are required to provide their own training for teachers, duplicating resources within states, making this one of the largest barriers in expanding online learning opportunities.

E-learning operates in many different contexts in the United States and is creating a need for new, cutting-edge research to evaluate courses and contextual approaches in online learning in order to expand the successes and avoid repeating initiatives that have not worked within online content, programs, and schools across the country.

Online learning is an important innovation and a growing solution for school reform – expanding choices and high-quality educational options, both virtually and in blended environments in the United States. State laws and policies dictate whether students have access to these options. Today, only 25 states and Washington D.C. authorize full-time, cyber charter schools. Thirty-two states support state virtual schools (Watson, J., Gemin, B., & Ryan, J., 2009). Based on the current research in K-12 online learning, the United States is seen as a leader in K-12 online learning implementations, but policies that support innovations through high-quality online learning are uneven and provide inconsistent opportunities for students across the states and need to be revisited and improved.

The History and Geography of New Zealand

Geography. The country of New Zealand is comprised of two main islands and a number of small islands including the Stewart and Chatham Islands. The two main

islands are separated from each other by the Cook Strait, with the southern island being the largest and most mountainous. New Zealand, outside Antarctica, is one the most isolated large landmasses in the world. “New Zealand’s closest neighbor, Australia, is some 1,200 miles away – farther than the distance from Los Angeles to Chicago, or from New York to the Grand Canyon” (Brooking, 2004, p.1). The country is part of the Oceania network of islands, which comprise most of the original Polynesian settled islands in the Pacific. Because of its geographic isolation, New Zealand was one of the last landmasses settled in the world. The original settlers, the Maori, were of Polynesian decent (McLauchlan, 2009).

Figure 1. New Zealand map/still. World Atlas. New Zealand. [Map/Still]. Retrieved April 6, 2010, Retrieved from Worldatlas.com: http://www.worldatlas.com/webimage/countrys/oceania/lgcolor/nzcolor.htm

History. The original Maori people came by the winds and were part of the waves of Polynesian settlement that originated from Southern Asia. Radio carbon dating places the initial settlement of New Zealand sometime between the 12th and 13th century (Sinclair, 2000). When the Maoris' began to settle in New Zealand they discovered one

of the most unique populations of wildlife on the planet. Unlike in most places of the world, the primary animal niches had been taken over by birds both large and small. The original Maoris' proceeded to hunt a large number of these unique birds to extinction, so by the time that the European's started to arrive, many of these birds had become extinct.

The first European captain to explore New Zealand was the British Captain James Cook, but the Dutch Seaman, Abel Tazman was actually the first European to discover and chart New Zealand. James Cook's initial relations with the Maori people were tenuous, but he soon learned "to manage them without taking away their lives" (Sinclair, 2000, p.32). Shortly after James Cook arrived, European trade was the next to come to the forefront with the majority of the enterprises originating from the Australian city of Sydney and the initial focus being on sealing and whaling.

With the arrival of the Europeans came new diseases that began to depopulate the island because the Maoris had a limited resistance to these new diseases. Along with the new disease, Maoris began to slaughter themselves with the use of guns, which were utilized to settle scores among the different Maori groups. Again, this took a huge toll on the Maori population.

Missionaries from the Wesylen and Anglican religions soon followed after the traders with the intention of converting the Maoris to Christianity. "By 1840 perhaps half the Maoris of the Bay of Islands were at least nominally converts to Christianity… and within a few years probably a majority of the Maoris had been converted" (Sinclair, 2000, p.43).

By the 1840s the scope of trade and commerce led the British to appoint James Busby as the first British Resident of this new independent territory. His responsibilities included trying to get the "Pakeha," settlers to behave, and the Maori to establish some sort of national government. "On 6 February [1840] some fifty chiefs signed the Treaty of Wiatangi. Missionaries and officials then carried it about the country and, after much further discussion, over five hundred Maoris, mostly chiefs, added their marks," (Sinclair, 2000, p.72) and a new Governor was appointed by the British in November. The new Governor, William Hobson's, chief responsibility was to get the Maori to accept the treaty, which defined the native's rights. The treaty was viewed by the European settlers, as the Maori acceptance of British rule and "was intended to lay a basis for a just society in which two races, far apart in civilization, could live together in amity" (p.74).

Within 40 years of the treaty being signed, New Zealand would change dramatically and would become the country that one recognizes today. The intervening New Zealand War's would be the Maoris attempt to control their own destiny and was caused by the settler's relentless encouragement on the Maori lands.

In the 1860s the New Zealand wars began with the principle Maori leader Rewi Manaipoto. He was eventually defeated in the Battle of Orakua, but not after inflicting significant causalities on the British regulars. 'The effect of the wars which is easiest to appraise was the loss of the Maori lands. The Maoris had sold about seven million acres in the North Island by 1860. Three million acres were confiscated …and between 1865

and 1892 they sold a further seven million acres" (Sinclair, 2000, p. 150) causing "many Maoris lived on liquor and credit" (p.153).

In 1842, William Hobson had set up New Zealand's capital in Auckland; however, in 1865, Wellington replaced Auckland as the capital. Wellington was a more centrally located city, making it easier for the government officials to travel during the sessions between their homes and the capital.

By 1852, the British granted limited self-government to the territory with the New Zealand Constitution Act. Between 1856 to 1893 there were nine different ministries, and it was during this time that the New Zealand economy had begun to take shape with the focus on the wool trade starting to come to the forefront (McLauchlan, 2009). The South Island would eventually become the focus of the wool trade and the North Island would become more focused on dairy and other farming activities.

The key to New Zealand's economic development would be refrigeration so that the different food products could be exported to market in England and other countries.

> From the 1890s, the New Zealand economy grew on a very simple template that was to remain basically the same until the 1960s. Pasture became, as it remains, the most important crop. The grass-fed sheep were bred to produce fat lambs and coarse wool. A predominantly Jersey (much later, Friesian) herd was developed to produce milk for processing into butter and cheddar cheese (McLauchlan, 2009, p.101).

This focus on the pasture would lead New Zealand to have a typical commodity economic cycle of boom to bust to boom. The New Zealand government encouraged this focus on farming, and slowly the quality of the products began to surpass its world competitors. As the new century arrived New Zealand was laying the ground work to

become one of the richest nations in the world, but within 15 years, World War I would lead to the greatest loss of life for New Zealand citizens.

At the turn of the century, New Zealand's two main political parties of the 20th century were being formed. The Reform League, which was focused on freehold land versus leasehold land, which would be a precursor of the National party (McLauchlan, 2009). On the other side of political spectrum, the Political Labour League and the Federation of Labour became the precursors of the Labour Party.

World War I would act as a crucible for both New Zealand and Australia with battles in distant places like Gallipoli helping forge both nations' identities. Prime Minister, William Massey, which placed New Zealand at the disposal of the British, led the outbreak of hostilities. These close ties to Britain would be profitable for New Zealand on an economic level, but would cost the lives of many New Zealander's on the battlefields of Europe (Sinclair, 2000). New Zealanders would prove their worth in both World War I and II, fighting throughout Europe, the Pacific, and the Middle East.

> Labour suffered a defeat in 1949 brining Sidney Holland to power as Prime Minister with 50 of the 80 seats in the House of Representatives. Thus the war was over. It wasn't followed by slump, but rather two decades of prosperity. The National party had ceased the political middle ground and it would hold it, with two brief interruptions for 30 years (McLauchlan, 2009, p.150).

In 1950, Sidney Holland took over as the Prime Minister of New Zealand, and he was against Socialism and Communism. During Sidney Holland's tenure in office, the upper body of Parliament the Legislative Council was abolished leading New Zealand to have a unicameral chamber.

The 1960s can be viewed as a turning point for New Zealand both economically and geopolitically. The Prime Minister from 1960 until 1972 was Keith Holyoake of the National Party. He would lead New Zealand in the signing of the ANZUS and SEATO treaties and supporting of the United States in Vietnam, which signaled New Zealand's growing involvement in Asian affairs (McLauchlan, 2009; Sinclair, 2000).

On the economic front, the growing fear that Great Britain would become part of the EU would deprive New Zealand of its largest trading partner and lead the Holyoake government to attempt to diversify its trading partners. "In 1967, the New Zealand Australia Free Trade Agreement (NAFTA) was launched" (McLauchlan, 2009, p.164). This was only a sign of things to come, over the next 20 years New Zealand would continue to diversify its trade to ensure its economic stability. The chart below highlights the how Great Britain while remaining extremely important would become less and less important as a trading partner.

Table 3

Direction of New Zealand's Exports: Percent

	UK	Australia	Japan	USA	Other
1930	80	3	-	5	12
1950	66	3	-	10	21
1970	36	8	10	16	30
1985	9	15	15	14	47

Note. The term 'other' covers markets in many places, including China, Iran, and the E.E.C. Adapted from "A History of New Zealand (5th ed.)," by K. Sinclair, p.325. Copyright 2000 by Penguin Books (NZ) Ltd. Auckland, New Zealand.

This diversification would pay dividends when Britain joined the EU in the 1970s, after being blocked by the French twice, by helping minimize the world economic downturn that was brought on by the oil shocks of the 1970s and the United States withdrawing its forces from Vietnam (Sinclair, 2000).

Like much of the world, the 1970s were a tumultuous decade for the Kiwi's. On the economic front the recessions in the 1970s led to the first decline in New Zealand's population since the coming of the settlers. During 1977 -1978, over 50,000 New Zealanders relocated to Australia (McLauchlan, 2009) because of the better economic opportunities.

On the social front Prime Minister Muldoon was allowing the South African Springboks to tour New Zealand and led to unprecedented protests against the Apartied regime of South Africa.

> With his colleagues' surprising support, or at least their pusillanimous acquiescence, he refused to intervene when the New Zealand Rugby Football Union decided on an All Black tour to South Africa in 1976. As a result, African and some other nations boycotted the Olympic Games in Montreal (McLauchlan, 2009, p.180).

This failure to understand the modern view of race relations would be rectified by future New Zealand Prime Minister's in the 1980s and 1990s. The Muldoon government would survive until 1984 when New Zealand would elect the Labour party.

The Lange government would face a balance of payment crisis and deficit crisis that forced the Labour government led by Lange to devalue the NZ dollar. Friction with the United States and Australia were brought to the forefront because of New Zealand's policy against allowing ships with nuclear weapons to dock at its ports. "There was a clear threat that New Zealand would be expelled from the alliance if it refused to accept the U.S.A.'s uncompromising policy of 'neither confirming nor denying' that a ship carried nuclear weapons" (Sinclair, 2000, p.335). This stance eventually led the United States to void the ANZUS treaty.

The 1990s and 2000s would have the National party holding power and then Labour for the balance of the 1990s, with Labour becoming a minority government in 2002. In 1997, Jenny Shipley would become New Zealand's first woman Prime Minister

and “in 1999, Labour’s Helen Clark becomes New Zealand’s first elected woman Prime Minister” (McLauchlan, 2009, p.207).

> Other changes brought New Zealand increasingly into a global environment. Its population became more multicultural. In the 1990s migration patterns shifted, with a large increase in Asian migrants. Between the censuses of 1991 and 1996, they constituted the fastest-growing group in the population (Sinclair, 2000, p.358).

The increased globalization, which started with airplanes in the 1950s have been accentuated by the arrival of the Internet and other technologies which New Zealanders have quickly adopted and “have enabled New Zealand to enjoy full and active membership in the global village” (Brooking, 2004, p.3). As a consequence, New Zealand’s place in the world will continue to change from a colony of Great Britain tied closely to the mother country to an international nation with a diversifying people and a diverse economy in the world.

Population of New Zealand

4,365,067 million people (Statistics New Zealand, 2010), a 1% increase from the 3,820,749 million people counted in the 2001 census, (Statistics New Zealand, 2002, p.1) now live on the islands, which make up the country of New Zealand. 67.6% of the country’s population is European, followed by 14.6% Maoris’, 9.2% of the people are Asian, 6.9% are the Pacific Peoples, and the remaining 2% are from other ethnic groups in the Middle East, Latin America, and Africa (Statistics New Zealand, 2006, p.2).

New Zealand has three official languages- English, Maori, and New Zealand Sign Language. “A total of 6,057 people can communicate in all three of New Zealand's

official languages" (Statistics New Zealand, 2010). Because of the British influence, English is the most commonly spoken language with 95.9% of the people speaking it, followed by Maori, which is spoken by 4.1% of the population (Statistics New Zealand, 2010).

In the 2006 Census, just over 2 million people, or 55.6 percent of those answering the religious affiliation question, affiliated with a Christian religion (including Maori Christian). This compares with the 2001 Census, when 60.6 percent of people affiliated with a Christian religion (Statistics New Zealand, 2006, p.11).

Sikah, Hinduism, and Islam were the three fastest growing religious populations in the 2006 Census. There was a 34.7% growth in people claiming to have no religion in the 2006 Census with the European population being the largest group to choose this option.

History of the New Zealand Education System

Because of New Zealand's small size and isolation the country's greatest asset is their people. The wealth of a nation lies in its people – their commitment to country and community, their willingness to strive and persevere, their ability to think, achieve, and excel. "Our future depends on our continually renewing and regenerating our leadership and citizenry, building upon the experience of the past, learning from the circumstances of the present, and preparing for the challenges of the future." (Singapore Ministry of Education, 2007). New Zealand has always taken the value of education seriously and its new reforms have done well as, "New Zealand schools consistently rate at or near the top

in international surveys," (Gordon, 1992, p.7) but it was not always that way as seen through its history.

Understanding how this system was formed and how it has developed to provide their children with a balanced and well-rounded education, "to produce sufficient people with the advanced levels of skills and knowledge demanded by the highly competitive, high-technology market place in which New Zealand must prosper" (Gordon, 1992, p.12) is essential to the research of understanding the current state of e-learning in New Zealand's secondary schools.

Education in New Zealand prior to 1984. "The education system in New Zealand was introduced by the British colonial authorities during the colonial period" (Catley, 2001, p.4). "Education was largely in the hands of the churches or private enterprise until the setting up in 1853-1854 of provincial governments which created regional boards of education" (Archives New Zealand, 2010, p.1). "Between 1854 and 1876, education was managed by six, and later ten, provincial education boards," (Butterworth, 1998, p. 22) with the exception of Maori education. The Maori population led their own schools, which were independent of the New Zealand government until 1880, when "the Department of Native Affairs transferred the control of Maori education to the Education Department," (Archives New Zealand, 2010, p.4). During this time, many children did not attend school as labour was valued more than an education in rural parts of the country.

As people were migrating to New Zealand in the late 1800s, they were trying to escape "the evils of a class-dominated society [and] had little tolerance of such replication of Old World evils" (Brooking, 2004, p. 72). The provinces were abolished and the central government began to organize education, which led to the creation of compulsory schooling with the Education Act of 1877. The first University in New Zealand, the University of Otago, was also founded during this time in 1869, and opened its doors to students in 1871 as this new importance for education grew, and "literacy rose from an already high 70 percent in 1870 to nearly 90 percent by 1890 which made New Zealand one of the most literate societies on Earth" (Brooking, 2004).

Primary school was the major focus of the first education act, which established twelve regional Education Boards who were responsible for public education. The Department of Education supervised the boards and was responsible for "providing funding, prescribing the syllabus of instruction, and certifying and classifying teachers" (Archives New Zealand, 2010, p.1). Charles Bowen, the chairman of the Department of Education, made clear that "the general administration of the schools must be left in the hands of Local Boards: for without such local administration it would be impossible to keep up the public interest which is necessary in an educational system…." (Butterworth, 1998, p.9).

Secondary schools fell under the supervision of the Department of Education as well but were not free or required. These schools were usually set up by private foundations and were set up "under private Acts of Parliament, which endowed them

with reserves of Crown land in lieu of direct financial assistance" (Butterworth, 1998, p. 22). Only students of privilege were fortunate to attend the secondary schools, which were governed by their own elected boards, and those who were fortunate to attend, continued their education at the university level.

After the Education Act 1877 was established, a national teacher's salary scale was created, physical fitness was introduced in schools, and regular inspections of schools and teachers were conducted annually (Archives New Zealand, 2010). However, "public education grew largely piecemeal, and reactively rather than proactively" (Butterworth, 1998, p.22). Over the years, demand for new services grew including correspondence education, special education services, secondary schools, Maori education and many others. The Department of Education gradually took responsibility for these services (Butterworth, 1998), by centralizing special education services and creating a Correspondence School in 1922 to meet the needs of students living in remote areas of the country. Finally, three other universities were created based on the New Zealand University Act 1874, the University of New Zealand, Auckland University College and Victoria University College, which were all run by the federal government until "a University Grants Committee was established in 1961 as a central agency to administer the universities" (Archives New Zealand, 2010, p.11).

"Teacher Training came under control of the Department of Education" (Archives New Zealand, 2010, p.4) around this time as well. Until 1903, teachers were trained at "Normal" schools in a sort of apprenticeship model and had to pay their own expenses.

Two Teacher Colleges had been established in Dunedin and Christchurch before the Education Act 1877 and by 1881 two other colleges were added in Wellington and Auckland. “A Parliamentary Select Committee Report in 1903 led to a reorganization of teacher training by the Department of Education” (Archives New Zealand, 2010, p.7) and additional colleges were opened years later.

The Department of Education also included the secondary schools as a part of the system. “The secondary schools were already operating on the decentralized model proposed in the 1877 Act when the great majority of them joined the state system” (Butterworth, 1998, p.23) under the Education Act 1914. This new Act also “required all secondary schools to offer free education to all those who passed a Proficiency examination. In 1944, the government made education compulsory for everyone under the age of 15 (Brooking, 2004).

Peter Fraser, the leader of the Labour Party, showed a deep interest in education and called for an overhaul of the New Zealand education system in 1937. He brought in experts from around the world to make recommendations around improving the curriculum, in a report called the Thomas report of 1944. Recommendations included adding new subjects to the curriculum such as social studies and more math and science courses to create a common, core curriculum to provide an education for all students, including those with varying abilities, interests and backgrounds which were not addressed in earlier Education Acts. A school certificate was also introduced and Matriculation was abolished and replaced with University Entrance. (Meikle, 1960) As a

result of all of these changes "most New Zealanders received a solid education thereafter for over a generation" (Brooking, 2004, p.122), including the Maori population, who while under control of the Education Department, the schools still remained separate from the traditional schools until 1969 when many of these Maori schools were abolished and the remaining few were transferred to the local Education Board control. During this time period several changes were also made at the tertiary level. In 1944, the Labor party made University education much cheaper and more widely available, opening up spaces to meet the demands of the growing number of students accessing a free secondary school education.

New Zealand education from 1984 to 1996. The changes made from the Thomas Report in 1944 remained in effect for over 40 years. No major changes or reports are documented until major reform happened in the mid-1980s when Brian Picot headed a taskforce to review education administration in New Zealand which described "the current administrative structure as 'over-centralized and made overly complex by having too many decision points…. And almost everyone feels powerless to change things they see need changing'" (Butterworth, 1998, p.10). The purpose of the reforms during these years would be to "discard the 'sheep-and-goats' mentality of the past in favour of one that assumed all students were capable of something" (Butterworth, 1998, p. 31).

Russell Marshall, a Member of Parliament for several years, was appointed Minister of Education in July 1994 when the Labour party won the general election. He was highly energetic and wanted to make changes to the current system through non-

traditional means. He felt that the Education Department was a complex bureaucracy, he wanted to bring the primary and secondary sectors together, and was aware that the polytechnic and technical sector was fragmented, as well as many other issues in the education sector (Butterworth, 1998).

These issues first came to light at the Educational Development Conference (EDC) of 1974. Over 50,000 people participated and the most important general recommendation that came from this event was that "greater attention should be paid to pre- and post-compulsory education, and that parents and the community at large should be encouraged to participate more fully in educational decision-making" (Butterworth, 1998, p.17).

Although Marshall was only Minister for two years, he made some very significant advances in advancing New Zealand's curriculum. In November 1984, Marshall commissioned a review of the Curriculum and Assessment in the country. In June 1986, the *Learning and Achieving* report was published that argued that the curriculum and assessment system was now out of date. "New Zealand schools were preoccupied with credentials and examinations, with six national qualifications in three years of schooling. Yet one in three students left school with no formal qualification, and for Maori school-leavers the ratio was two in three" (Butterworth, 1998, p.45). In 1945, the School Certificate was the heart of the education system and this recommendation changed things up in New Zealand when a five-grade scale was used to report the results of subjects and the notion of an overall pass or fail was removed (Butterworth, 1998).

Although, Marshall was only the Minister of Education for two years, he led a few major reforms in the area of education in New Zealand.

Although Marshall did not have enough time to implement all of the changes he had hoped, his influence kept the Parliament and Treasury talking and focused on education change. People in New Zealand were still dissatisfied with the education system as shown in the *Report on the Inquiry into the Quality of Teaching*, otherwise known as the Scott Report, which examined policy, administration and expenditures related to education. "The report dealt broadly with the purposes of education, the need to ensure learner outcomes, the quality of teaching, and professionalism and accountability" (Butterworth, 1998, p.54). The teacher was shown as vital and the report recommended nine issues that needed to be addressed to improve the quality of teaching in New Zealand. The committee put the student at the center of the education system, and argued the need for more community and family input and recommended creating a structural change to improve learning.

Education Minister, Marshall, in his last year realized he could not overhaul education on his own. He was moved to the Foreign Affairs department in a reshuffle after the August 1987 election. But before he moved, his team organized three taskforces to review education. The Meade Committee, led by Anne Meade, was established in January 1988 to review Early Childhood. The committee that made the most progress to reforming education was the Picot Taskforce, led by Brian Picot, an experienced businessman, which started their review of K-12 education in July 1997. The final group,

the Hawke Committee, led by Professor Gary Hawke from Victoria University, was "charged to define the government's role in Post Compulsory Education and Training" (Butterworth, 1998, p.98). These three committees would work together, but the most impactful report would come from the Picot Taskforce.

The picot report. Although the New Zealand education system consistently ranked near the top of the scale on international tests, there were a lot of criticisms of the schooling system. "They related 'to the unresponsiveness of the centralized bureaucracy, the inability of the system to respond to Maori demands for a more effective education process and the apparent lack of effective communication between central structures and local demands" (Gordon, 1992, p.5). The Picot taskforce was directed to consider administrative efficiency and to "identify any costs and benefits of its recommendations and recommend the nature and timing of any necessary transitional arrangements. It was not concerned with curriculum or other teaching matters" (Butterworth, 1998, p.72). This was one of three committees commissioned to review education, although this team was different in that it was not a part of the comprehensive review of government as were the other two. The Hawke and Meade committees were appointed in early 1988 to review the education system as well, and all three committees kept in touch throughout their reviews.

At the Picot taskforce's first meeting, they wrote out ten guiding principles to help them through the process, with their core belief being that "the school existed to serve the child, and that the child's interests should be paramount" (Butterworth, 1998, p.81). From

there they started from scratch feeling that they could not adapt an outdated system to meet the needs of their students. They created four assumptions that would guide their report, which were:

- "choice;
- an assumption of individual competence;
- cultural sensitivity;
- good management practices" (Butterworth, 1998, p.81).

The overarching recommendations of the Picot report included proposals for "autonomous self-managing schools, charters, bulk funding (or 'direct resourcing' as it is now officially termed), the Education Review Office, and the New Zealand Qualifications Authority" (Butterworth, 1998, p.82).

The charter document would serve as a contract between the Ministry of Education and the school and the Education Review Office would serve as the go between to ensure the government was supporting the school and would report back to the Ministry of Education on the school's performance. The adoption of these new charters implied creating a Board of Trustees for each of the schools. The report specifically recommended the use of the word "trustee" as it implied more legal and accountability responsibilities.

The Education Boards that were created and implemented from the Education Act 1877 had been declared ineffective and their existence debated since 1912. The Picot Taskforce did not go into their review with the intention of removing the boards, but after several deliberations, made the choice to get rid of them. Their decision arose from two considerations, which was the implementation of the charter, which was now a legal contract between the school, ministry, and Minister of Education. The charters "define the purposes of the institution and the intended outcomes for students…within the national objectives for education" (Gordon, 1992, p.7). The taskforce created a list of several responsibilities and assigned them to the Ministry and schools. In the end there were only three functions on the list that remained unassigned, Advisory Services, the SES and school transport (Butterworth, 1998). The taskforce recommended the creation of Educational Regional Centres to address these topics.

Six other areas were specifically addressed: the Maori population, teachers and teaching, coordination of tertiary education, special education and advisory services, parent choice, and school property. The Maoris' could now have their needs addressed through the charters and had the right to create their own full immersion school or school within a school through the government which addressed a lot of their previous issues with the system. For teachers, the monopoly of teacher education schools was removed and a federal teacher registry was created. Tertiary education was discussed but was not addressed as the Hawke Report focused on higher education specifically. Special Education Services and Advisory Services were both recommended to be privatized in

the Picot Report, but to this day, these issues have not been fully resolved. School choice was created with the creation of the charters. Parents could move their child to the school of their choice if they were not happy with the one they were assigned. Finally, the taskforce was able to review the real estate portfolio of the Ministry. Although they did not have as much time as they would have preferred, they did recommend hiring someone at the national level to take oversee the portfolio and buildings (Butterworth, 1998).

> The Picot Report recommended 1 October 1989 for the changeover to the new system, thus allowing eighteen months' lead time…. The Meade Report on Early Childhood Care and Education also opted for this date, while the Hawke Report on Post Compulsory Education and Training proposed a changeover date of 1 July 1990, giving it an additional nine months (Butterworth, 1998, p.90).

Tomorrow's schools. The three reports were delivered to the Minister of Education and the committees were disbanded, and all was now in the hands of the politicians and government officials (Butterworth, 1998). Prime Minister, David Lange, was very pleased with the Picot report, as was most of the public. Tomorrows Schools was the Ministers blueprint for the process of changing New Zealand's schools. With a few minor changes, the majority of the recommendations were approved for implementation across New Zealand's education system. The Meade and Hawke report recommendations were also passed without virtually any changes and the implementation took place over the next year and a half. The Department of Education was replaced with

a ministry, and schools were then managed by boards of trustees and became autonomous entities.

In November 1990, Cathy Wylie, the head researcher for the New Zealand Council for Education Research, surveyed trustees, principals, teachers and parents and found that they were "living up to the goals set out in their charters. The parents were also highly satisfied with the quality of their children's learning. Many principals and trustees enjoyed the greater autonomy of the school" (Butterworth, 1998, p.171). This was the second of three surveys, and in her final report in 1992 Wylie noted that all of the changes had worked. "However, she expressed concern that a resource gap appeared to be developing between schools" (Butterworth, 1998, p.172). With all of the new responsibilities on the administration and no new resources for them, they were overwhelmed and felt under-resourced.

New Zealand's new education blueprint: 1997-present. Today, four groups oversee education in New Zealand. The Ministry of Education "gives policy advice, implements policy, develops curriculum statements, allocates resources, and monitors effectiveness. The New Zealand Qualifications Authority administers qualifications and provides assurance about qualifications quality, oversees the examinations system and develops the National Qualification Framework" (Catley, 2001, p.4). The Education Review Board evaluates and reports the performance of individual schools, and the Teachers Registration Board registers teachers. These four groups oversee and fund the three types of schools: state, private and state integrated schools. Private schools heavily

rely on tuition and fees from students for funding, but do receive about 25% of their funding from the government. “Integrated schools are schools that were previously private and have now been integrated into the state system. They follow the state curriculum requirements but incorporate their own special character (generally a philosophical or religious belief) into the school program. Integrated schools receive the same government funding for each student as state schools, but the buildings and land are privately owned so the school meets the costs of property development and maintenance from attendance dues” (Marlo-Ferguson, 2001, p. 963).

With the new changes in education, the Maori population has seen great improvements in the participation and attainment of the Maori students. Maori students are more likely to attend early childhood education and to stay in school, and more Maori students than ever are enrolling in tertiary education (Catley, 2001). There has also been an increase in the number of Maoris entering the teaching profession. Finally, there has been a new focus on languages. “The Maori Language Education Plan (MLEP) is the education focused part of the government’s Maori Language Strategy,” (Catley, 2001, p.6) which will help deliver high quality Maori language education in New Zealand’s schools.

The Maori population is not the only group that has seen improvements. In 2008, the Education Index, published with the UN’s Human Development Index, based on data from 2006, lists New Zealand as 0.993, amongst the highest in the world, tied for first

with Denmark, Finland, and Australia, and the Programme for International Student Assessment ranks New Zealand's education as the 7th best in the world (OECD, 2010).

With the Labor party in government, education is a priority. "Labor sees quality education as a basic right, which must be available to all children. If New Zealanders are better educated, the whole society will benefit, both socially and economically" (Catley, 2001, p.6). Their focus is on improving teacher professional development and the training of pre-service teachers. They also want to continue to improve the progress of the Maori population, and finally, they

> argued that there was a need to build capacity in technology and schools buildings for the future. To achieve this Labor will ensure that teachers are trained in the use of information technology and will investigate bulk-buying options for hardware, software, and networking systems (Catley, 2001, p.7).

Curriculum reforms were completed in the 1990s to update what was taught in schools to prepare New Zealand to become a knowledge society, "New Zealand has to better foster people's ability and willingness to learn skills in communication, numeracy, information, problem solving, and social and cooperative behavior, across a range of learning areas." (World Education Encyclopedia, 2001, p.970). This focused on providing students with new skills that would enable them to be productive citizens in a global community. The most recent update to the curriculum was done in 2007. The New Zealand Curriculum (NZC) "gives schools direction for teaching and learning. It is a framework rather than a detailed plan and schools develop their own curriculum and teaching programmes from it" (New Zealand Ministry of Education, 2010e). The individual schools are responsible for developing and implementing a curriculum that is

consistent with this new plan. The individual school's curriculums will be developed over time through an ongoing process as student needs and resources change over time in order to personalize their learning. A chart detailing the NZQ is provided in Figure 1 below.

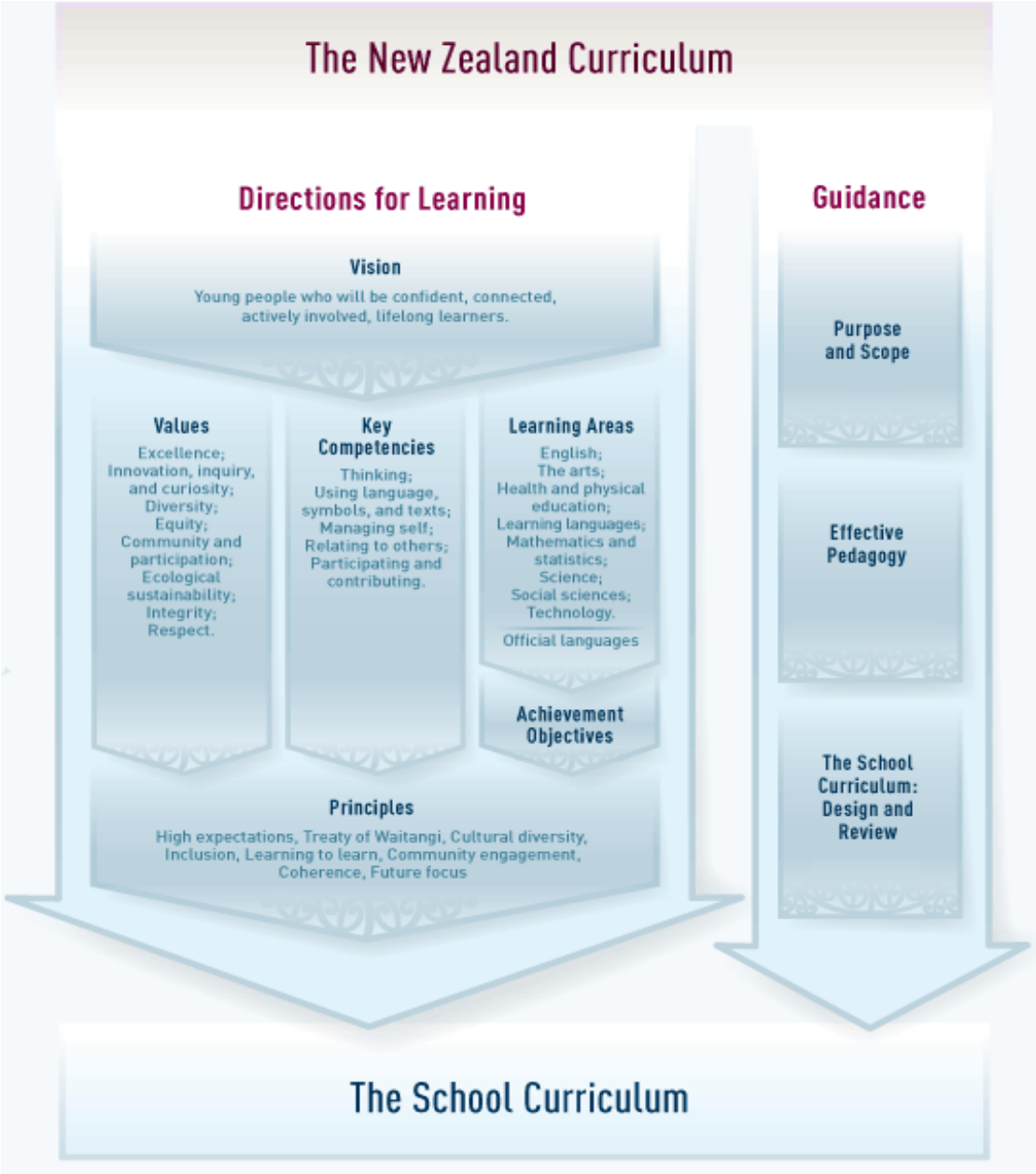

Figure 2. The New Zealand curriculum model. Adapted from "The New Zealand Curriculum: by New Zealand Ministry of Education. Copyright 2010 by the New Zealand Ministry of Education, Wellington, NZ. Retrieved on May 1, 2010 from http://nzcurriculum.tki.org

Within this new curriculum, new requirements such as foreign language brought a larger need for access to specialized teachers. In order to access these teachers and provide new opportunities for students in rural areas of New Zealand, a growth in ICT and e-learning were seen across the country.

Education Technology and Online Learning in New Zealand

Education technology is a priority of the New Zealand Ministry of Education. They have created three key documents to implement their ICT and e-learning strategies, which include: *Creating a Digital New Zealand: New Zealand's Digital Enabling the 21st Century Learning: An e-Learning Action Plan for Schools 2006-2010.* The National Digital Strategy was developed by several sectors of the New Zealand government to form "a strategy about how a digital future for all New Zealanders will be created, using the power of information and communications technology to enhance all aspects of our lives". (New Zealand Ministry of Education, 2009) Their goal for education in this strategy is to "improve learner achievement in an innovative education sector, fully connected and supported by the smart use of ICT" (New Zealand Ministry of Education, 2009). Over the last few years they have developed an infrastructure for education. The Ministry's hope is to provide students, teachers, and administrators with access to digital content and opportunities to support high quality learning opportunities for both teachers and students.

New Zealanders sometimes think of their country "as small, remote, and sometimes irrelevant" (New Zealand Ministry of Economic Development, 2008, p.4).

Their lack of natural resources also has pushed them to become creative and leaders in using technology. Their vision for the country's future is "that New Zealanders should be leaders in the digital world and use digital technologies, skills and opportunities to contribute to a prosperous, sustainable and vibrant society" (New Zealand Ministry of Economic Development, 2008, p.2). They want to connect to the rest of the world, spread awareness of the potential for these new technologies, and bring everyone in the country on their journey, including students and teachers.

"People are the bedrock of Digital Strategy 2.0. New technologies foster innovation, but it is people – entrepreneurs, researchers, creatives and people working to make a difference in communities – who are the real source of creativity" (New Zealand Ministry of Economic Development, 2008, p.7). The Government's role in the strategy is to provide the infrastructure to enable creativity, innovation and collaboration to move the country forward as an international leader in our new digital world. They want to create high-value content for themselves and to export in the areas of e-learning, e-health and online gaming (p.9) to enhance their productivity and global competiveness.

New Zealanders believe that

> in the future, an interactive web will link not just computers, but other critical infrastructure such as buildings, transport systems and the energy grid. This 'internet of things' will allow us to transform the ways we use resources, travel, communicate with each other, and earn a living (New Zealand Ministry of Economic Development, 2008, p.8).

They are preparing for this new world by implementing their new digital strategy throughout business, government and education systems in New Zealand.

The plan is broken down into sections to create a prosperous, sustainable and vibrant society by becoming smarter through digital means to improve the economy, the environment, and their communities and culture. The government will invest 500 million dollars and the private sector an additional 2.5 billion dollars over the next five years to ensure open, fiber or equivalent high-bandwidth networks are installed in all government, business and educational institutions by 2012 and an additional "$160 million will be invested in broadband across the health and education sectors"… so that 'by 2012 all educational institutions will have access to a high-speed National Education Network, transforming the way our children learn"' (New Zealand Ministry of Economic Development, 2008, p.9).

Education has always been a priority since the original strategy. Investments in professional development and content creation were implemented as well as an initial infrastructure. Teachers were trained in the pedagogy of teaching online and the ability to create and use digital resources in their classrooms. Content has also been created and digitized to use throughout the nation's schools. In this new strategy, education is seen as one of the new networks of community and connectivity. "High quality information will be stored digitally and shared safely and securely across the sector, giving educators and learners better access to digital content, resources and services" (New Zealand Ministry of Economic Development, 2008, p.16) in a safe and secure environment. With a new education network created schools and educators can share resources with one another, whether they are related to the content or to a specific student in a seamless system. In the

final goal of this educational system, the government hopes to share their digital content on an international level in order to create a new export opportunity for the country.

Through this new education network, New Zealand has made it their goal to prepare all of their students for the 21st century workforce. They have set two targets for education in the National Digital Strategy that "by 2012, the fill rate for ICT related jobs increases to 75 percent" (in 2007 it was at 53 percent) and that "by 2012, there has been a 100 per cent increase in the number of graduates entering digital careers" (New Zealand Ministry of Economic Development, 2008, p.36). Not only will students be able to access digital resources throughout their education, they will also gain digital literacy, Internet Safety and technical ICT skills. Teachers will also engender students to be creative and provide them with the schools to work together in groups.

In order for students to become productive in the 21st century workforce, New Zealand is working to implement professional standards and international benchmarks for ICT qualifications with local computer societies to allow teachers and students to better understand what they need to master in order to be successful in the workforce. Digital Technology Guidelines for grades 11-13 are also being developed to ensure students leave school with the technology skills to enter into an ICT related career (New Zealand Ministry of Economic Development, 2008). With these newly acquired skills, the government and Department of Labour can help recruit these students into digital careers.

From the national *Digital Strategy 2.0* came the *ICT Strategic Framework for Education* to "provide the mechanism to guide and co-ordinate ICT investment towards

the government's vision of improved education and outcomes" (New Zealand Ministry of Education, 2006b, p.3). The *ICT Strategic Framework for Education* has "the following goals of creating:

1. A more learner centered education system transcending organisational boundaries.
2. More informed decision making within the education sector by learners, teachers, parents, communities, public, businesses, researchers, policy makers, and administrators.
3. Increased ease and opportunity of access and reduced compliance costs for all participants.
4. Increased confidence, capability and capacity form the use of ICT by all participants in the educations sector.
5. Greater opportunities for the generation, application and sharing of new ideas and technologies.
6. More effective and efficient investment in ICT by education sector government agencies" (New Zealand Ministry of Education, 2006b).

The Ministry of Education hopes to achieve these goals through a variety of ways. They want to develop a more learner-centered environment that focuses on the outcomes and the people instead of solely on the technology. They want to create an easy to access and navigate system for learners to communicate with others on both a local and national system. They will focus on coherence through open standard rather than

standardization and focus on a user-focused approach to implementing the technology, and finally they plan to establish and maintain an environment that supports and nurtures a collaborative and innovative culture where students are encouraged to be creative and share their ideas with one another (New Zealand Ministry of Education, 2006b).

The Ministry of Education has developed a detailed strategy for how they will approach and aim to reach of their goals, which focuses on the learner. They want to move away from the industrial age approach to a "one-size fits all" approach to educating children. In their approach, they are considering numerous things to ensure each student is successful as shown in Figure 4 below.

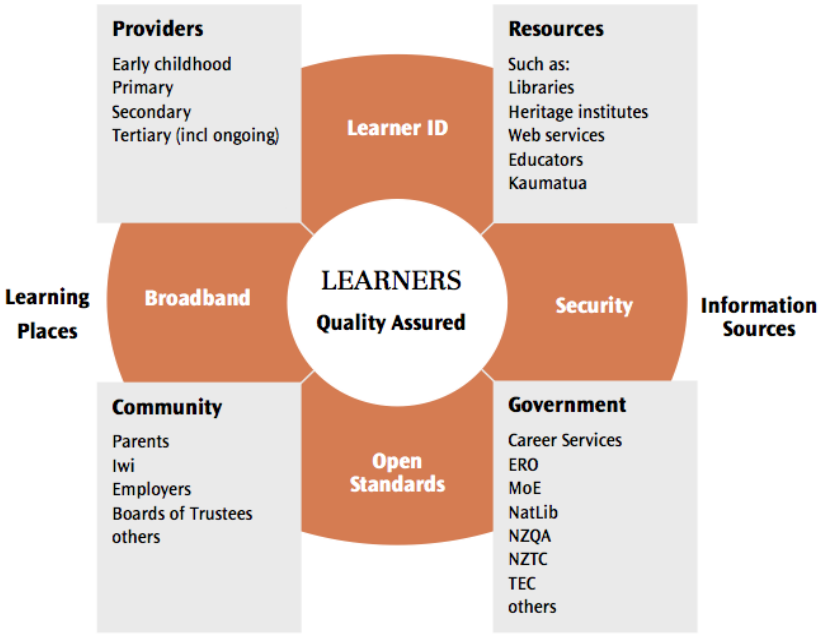

Figure 3. Learner centered figure. Figure shows how the New Zealand Ministry of Education has put the student/learner in the center of education. Everything is created around all students. Adapted from "ICT Strategic Framework for Education 2006-2007," b

Collaboration between all of these groups and sources will help reach the nation's goals as well as provide a more individualized educational experience for each student in New Zealand, which has created the path to implement online learning in New Zealand's schools.

New Zealand's e-learning action plan. E-learning in New Zealand is defined as: "Learning and teaching that is facilitated by or supported through the smart use of information and communication technologies" (New Zealand Ministry of Education, 2006a, p. 4). The Digital Strategy and Framework for ICT in Education documents both provided the framework and goals for the country, where the e-Learning action plan lays out a more detailed plan for implementing the technology into practice. In *Enabling 21st Century Learners: An e-Learning Action Plan for Schools,* the country has developed "the foundation for effective e-Learning practices to be integrated into New Zealand educational practices" (Powell & Patrick, 2006, p.15).

The action plan builds on the strategic framework's focus on a learner-centered education for students through e-learning. "e-learning has the potential to transform the way we learn. It's about exploiting technologies and using ICT effectively across the curriculum to connect schools and communities and to support evidence-based decision making and practices in schools" (New Zealand Ministry of Education, 2006a, p.3). This report describes the goals specifically for e-learning and the projects, tools and resources that will be developed to support e-learning from 2006-2010.

The priorities for this report are that:

- "All students experience effective teaching;
- Children's learning is nurtured by families and whanau;
- Evidence-based practices are used by all involved in schooling" (New Zealand Ministry of Education, 2006a, p.4)

Through e-learning, these priorities will help "provide accessible, relevant, and high-quality learning opportunities so that every student is better able to achieve their full potential" (p.4). The Schools' e-Learning Action Plan chart, see Appendix C, provides a roadmap for how the country has planned to implement online learning in the schools. It includes all of the constituents, tools, resources, and evidence-based teaching practices to ensure all students achieve their potential.

Two prior action plans helped lay the foundation for implementing online learning throughout New Zealand. The previous plans provided teacher professional development, creating and finding online learning resources for teachers to use in their classrooms, building and implementing the technological infrastructure and mainstreaming the role of technology into the culture of the schools strategically (New Zealand Ministry of Education, 2006a). From 1998-2006, these foundations were laid allowing for a more learner-centered education for each child in New Zealand. The technology infrastructure has been built and during this time frame schools have found "a particular strength has been a focus on increasing the capability and confidence of teachers to use ICT to support student learning" (New Zealand Ministry of Education, 2006b, p.6).

ICT is now a part of the school culture and is seen as an integral part of a teacher's professional practice. However, the new practices are not fully embedded in all teachers' lessons and practice. The goal of this new e-learning plan is to make that systemic transition. The country is researching and evaluating the best and most effective ICT teaching practices to adopt throughout the school system. The have focused their change and innovation in schools on "a bottom-up model with support and guidance from the centre" (New Zealand Ministry of Education, 2006b, p.7) in hopes that teachers will reflect and collaborate within their community of teachers. Through this new e-learning action plan the Ministry of Education plans to keep teachers updated on the most effective online learning teaching practices through the ICT tools to model best practices.

Through this new communication, the MOE will provide technology for students, teachers and the community to develop communities of practice and online learning environments for collaboration to improve teaching practices and student learning from a variety of resources. Throughout these new systems, teachers will have the opportunity to explore ICT and digital content resources in order to become capable users of it. They will have the opportunity to work with students, administrators and other teachers to learn these new technologies and to support one another in order to advance e-learning opportunities. "It is the teacher's strategic use of instruction that makes the difference. The teacher is continually making professional decisions, responding to instructional situations as a flexible problem solver, and monitoring their students' progress. Effective teachers don't follow predetermined programmes of…instruction. They align the…

activities with their students' progressions. (New Zealand Ministry of Education, 2003, Page 79; New Zealand Ministry of Education, 2006a, p.10). To achieve effectiveness, the MOE will provide teachers with professional development to create new blended and online learning environments and on how to use the customized ICT tools to create these environments effectively and efficiently. With the new tools and professional development from the MOE, teachers will now be able to build partnerships around the country and will be able to streamline communication and learning in order to provide a customized learning experience for each student (New Zealand Ministry of Education, 2006a).

School administrators and School Boards of Trustees are also given specific actions and outcomes in the e-learning plan in order to support teachers and students in online teaching and learning. Their role is to provide leadership and insight to expand options for students and teachers through ICT. They are given three outcomes to focus on which include:

> (a) Leaders have the confidence and capability to effectively lead and manage ongoing e-learning development in schools. (b) Boards of trustees' and the wider school communities' understanding of the role of e-learning in schools of the future is strengthened. (c) School leaders and boards of trustees understand the need for and have implemented appropriate cyber security and safety policies in their school (New Zealand Ministry of Education, 2006a, p. 13).

School administrators and community leaders will be key in the implementation of e-learning environments in the schools. Their leadership and ability to provide the needed training, tools, and support for their teachers will be essential to the success and

effectiveness of the programs. “Schools use their existing and operational funding to provide online learning for students, however there is specific funding provided by the government available for e-learning” (Powell & Patrick, 2006, p.15). School leaders can access these additional funds to pilot new projects and initiatives if they have the vision to expand opportunities for students through e-learning.

A student’s family and community also play an important role in their education and New Zealand has recognized this as well. They have created goals to provide them with bandwidth in their homes and to increase communication and educational opportunities for families and community partners to better understand how online learning and ICT works and how they can support their children throughout their schooling.

Research and development of effective practices and technologies is the final item discussed in New Zealand’s e-learning action plan. “As new technologies and media expand rapidly in students’ lives outside the classroom and schools adopt new technologies and services, educators also need to stay abreast of the evidence on how to maximize these opportunities for learning in the classroom” (New Zealand Ministry of Education, 2006a, p.17). However, in some cases, such as with e-learning the innovations and practices are outpacing the research. New Zealand realizes this and encourages their teachers and administrators to be innovative, but to also reflect on their effectiveness and share this with others in their professional communities. The Ministry’s investment in the professional development of their teachers also needs to be evaluated to learn how they

can improve. "This requires the ongoing development and implementation of appropriate monitoring, assessment, and evaluation methodologies and tools that will enable educators to modify and improve their current practice and to design new directions for e-learning" (New Zealand Ministry of Education, 2006a, p.18). This will be accomplished through evaluating current e-learning initiatives throughout the country and on an international level, which will be used to inform ongoing online learning policies and initiatives.

New Zealander's also recognize the benefit of working with other countries. Forming partnerships with other Ministries of Education and non-profit organizations around the world will grow their evidence base. They will also be able to find new innovations that have potential for strengthening and expanding e-learning options for students. The Ministry hopes to do this by "increasing e-learning in schools' funding to research effective teaching in particular e-learning contexts" (New Zealand Ministry of Education, 2006a, p.19). They will also continue current projects that are showing to be effective and to continue carrying out research on effective practices for teachers and technology tools and resources for e-learning and by collecting data on an ongoing basis to evaluate current practices.

Summary

Although New Zealand is one of the most remote countries in the world, made up of two small islands and only has a population of 3.4 million, it ranks in the top 50 economies in the world (Cylist.com, 2010) and is also ranked as the twentieth most

competitive nation in the world. (World Economic Forum and INSEAD, 2009, p.13). One of the country's most important resources is her people and she must rely on them to survive. Since the European's first settled in New Zealand, the focus of education was on building the nation, bringing the people together and preparing for economic survival. "The education system was tailored for the masses so that all could contribute to the economy and to the nation-building process." (Lim & Tan, 1999, p.402). The 1980s brought changes to the education system with the introduction of the Tomorrow's Schools. The vision of the new curriculum helps individual students develop their unique talents while reaching their full potential to be educated as well-rounded citizens of New Zealand. New Zealand is a country that "constantly reviews and revamps its education system with the aim of enhancing its economic competitiveness in the global economy" (Lee, 2002, p.263) and will continue to research new ideas and pedagogies to remain one of the most competitive countries in the world.

The implementation of the ICT Education Strategies has made them a leader in the area of educational technology, with a specific emphasis on online and blended learning as well. However, little research has been done to document the process and implementation of the e-learning initiatives within the country. The need for what things worked and did not work throughout the implementation from the various participants involved in the process will help other countries along their journey of implementing online learning for secondary students.

Chapter III: Research Methods and Design

The purpose of this study will be to describe the current e-learning initiatives and projects for students in secondary schools in New Zealand. This chapter describes the design of the study, restates the research questions, describes the scope and sources of data as well as considerations for human subjects, and provides a description of the data gathering instrument, proposed analysis procedures and validation processes that were employed.

Design

The purpose of this descriptive case study was to explore, understand, and describe the current e-learning initiatives and projects for students in secondary schools in New Zealand. The study employed the case study method to help understand processes of online programs and to discover context characteristics that will shed light on e-learning in secondary schools (Merriam, 1998). A qualitative approach was selected for this study, as it allowed the researcher to describe and interpret the perceptions and experiences of the Ministry of Education, school administrators, and secondary school teachers of secondary school students. Understanding the process of implementation of online learning throughout the secondary education system will most likely be of interest to leaders, stakeholders and developers who are starting and growing e-learning programs and schools throughout world.

Case study method. A review of the literature was conducted in preparation for this project, and that research indicates that this study may be the first to examine the full implementation of policy, operations, professional development and content development of online learning in New Zealand's secondary schools. To implement this plan the researcher conducted a case study, focusing on a single case: online learning in the country of New Zealand's secondary schools (Stake, 1995).

According to Merriam (1998),

> A case study design is employed to gain an in-depth understanding of the situation and meaning for those involved. The interest is in process rather than outcomes, in context rather than a specific variable, in discovery rather than confirmation. Insights gleaned from case studies can directly influence policy, practice, and future research. Case studies are differentiated from other types of qualitative research in that they are intensive descriptions and analyses of a *single unit* or *bounded system* (Smith 1978) such as an individual, program, event, group, intervention, or community (p. 19).

The case study focused on the implementation of online learning in secondary schools in New Zealand. While it may be important to know and understand the effectiveness of a program after it has been implemented, the focus of this study was to analyze the process of the implementation. "The lack of concern for implementation is currently *the crucial impediment* to improving complex operating programs, policy analysis, and experimentation in social policy areas." (Patton, 2002, p.161). The research questions of this study allowed the researcher to gather detailed, descriptive information about what is going on in the program, how the program has developed over time, and perceptions of what worked and what did not work during the program's implementation (Patton, 2002).

This study attempts to tell a story about the unique online learning program in New Zealand by capturing the experiences of the education ministry, school administration, and teachers' experiences through artifact collection and face-to-face and online interviews.

Scope

The scope of the study was limited to the over 2,000 primary and secondary schools in New Zealand and the Ministry of Education of New Zealand. All of the involved schools are state schools and state integrated schools, which are primarily funded by the central government (World Education Encyclopedia, 2001).

Sources of Data

Two types of data from multiple sources were used in this study, and they can be categorized as existing data or newly acquired interview data. Each is described in detail below.

Existing data. In the spring of 2006, the researcher worked as a consultant for the International Association for K-12 Online Learning (iNACOL). One of the projects she completed was a survey to collect data from over 15 countries. She asked leaders in each country's Ministry of Education (MOE) to provide information about the current state of K-12 online learning. The returned surveys resulted in a large amount of data in the form of detailed descriptions of how online learning is implemented and provided within each

of these countries. New Zealand's MOE provided a response to the survey, and the data from their completed survey are reported in this study.

Newly acquired interview data. Financial, geographic, and temporal constraints prevented the researcher from being able to conduct face-to-face interviews of a large sample of teachers, administrators, and MOE officials in New Zealand. Therefore, some electronic communications were used to conduct the interviews. For this study, the researcher solicited interview data via email and VoIP software from secondary school teachers, administrators, and MOE officials distributed across the state and state integrated secondary schools. The criteria for selection of these teachers and MOE officials include the following: teaching, participating in, or implementing online learning with secondary students as well as being representative of a variety of different contexts. Such contexts would include: policy makers from various branches of the Ministry of Education and principals and teachers from a few of the schools who were first to implement online and blended learning opportunities as well as participants from schools who implemented ICT later in the process. The researcher also obtained a list of email addresses from the Ministry of Education prior to the study. Tacit and non-verbal communications were absent from an email interview, but the use of email has been proven to be a viable source of qualitative data (Mann & Stewart, 2000; McAuliffe, 2003; Selwyn & Robson, 1998).

The guidance provided by Anderson and Kanuka (2003) and Mann et al. (2000) for email protocols were followed. These processes included establishing and

maintaining rapport and trust; reflecting in a journal how the Internet may be influencing the interview process; writing short, easy to read and understand, jargon free questions; and providing adequate instructions. Each participant was sent an introductory email, which provided a brief description of the study and a request for their voluntary participation. This process provided some indication of the number of participants willing to respond, and provided the participants with an opportunity to seek clarification and understanding before committing to the study.

Creswell (1998) recommends that an actual interview use no more than five-open ended questions. Participants, however, were sent nine open-ended questions that focused on the central research questions. This process somewhat expanded the Creswell recommendation. Some additional follow-up emails were sent for clarification. The interview protocol can be found in Appendix A.

In addition to the email communications, the researcher traveled to New Zealand for two weeks in January 2010. While in New Zealand, the researcher interviewed teachers and administrators involved in online learning from several secondary schools where online learning has/is being implemented. These interviews were recorded. The researcher was also able to visit the Ministry of Education to conduct interviews with the Ministry of Education's e-learning team and other officials within the Ministry. These interviews used open-ended questions that lead to discussions on online learning in secondary schools in New Zealand.

The nine questions that the researcher posed included the following:

1. What has been your role in the implementation of e-Learning in New Zealand's secondary schools?
2. What is the nature and extent of e-learning in New Zealand's secondary schools?
3. What steps were taken for New Zealand's Ministry of Education to implement a system-wide online learning environment across the country?
4. What areas of the implementation of online learning in New Zealand's secondary schools have had the greatest impact?
5. What problems/obstacles did you encounter and ideas did you abandon during the implementation of online learning in secondary schools?
6. What are the unexpected benefits of implementing online learning in the country of New Zealand?
7. What are your plans for the future of online learning in New Zealand's secondary schools?
8. Would the approach used here in New Zealand work well in other countries? Why or why not?
9. What advice would you give someone preparing an online initiative based on your experiences here in New Zealand?

Process for collection of data. The original recorded interviews were downloaded into a software program for easy access and review. The researcher then had them transcribed by a company that specializes in this service. All of the transcriptions

were stripped of identifying information. Each interview was given a number to label the information from each participant in order to identify the source in the study's findings.

To ensure the accuracy of the interviews, the researcher returned the transcriptions to each interviewee to make any edits and to correctly input information that was not transcribed due to the heavy accents of some of the participants. After the transcriptions of the interviews were reviewed, the researcher removed all information that was not directly related to answering one of the five research questions. The applicable content was then sorted based on the specific research question and then put into themes within the data.

Human Subjects Considerations

This study abided by all regulations governing the protection of human subjects from any and all harm, including those at the New Zealand Ministry of Education, and Pepperdine University. The study design and plan was submitted by the researcher, as required by Pepperdine University, for review and approval by the Institutional Review Board (IRB) through an exempt review application and was approved prior to the study being conducted. The research involved no more than minimal risk to the participants who were all consenting adults and in no way adversely affected their welfare and rights. The research study was submitted for Exempt Review under Category 7. The researcher worked with the Ministry of Education about IRB policy within the Ministry. The approval of Pepperdine University's IRB, will suffice for working with the Ministry of

Education (MOE) in New Zealand. A copy of the Pepperdine-approved IRB proposal appears in Appendix A.

All participants in this study signed a letter of informed consent at the time of the interview. The signed informed consent form verifies that they were adequately informed of the purpose of this study, the questions they were asked, how the information they provided was to be recorded and transcribed, their confidentiality and anonymity; and most importantly, the potential contributions to the field. They were reminded that participation in the study was totally voluntary and that they were able to terminate their participation at any time. Participants were also asked if they wanted to participate in peer-checking to review and confirm the data before the study was published.

Data Collection and Analysis Procedures

Data collection. The MOE was contacted for permission to conduct the study and agreed to participate in the study. They directed the researcher to the employees in the MOE, secondary school administrators, and secondary school teachers who participated in interviews. After the researcher completed the preliminary oral defense, she contacted the MOE to schedule interviews. An explanation of the study was presented and a consent letter provided for all participants, prior to the interviews. The researcher informed each participant that this was a voluntary study and they could opt out at any time. The researcher also explained that only the researcher will know the identity of the participants and their answers. As part of the verification of the study, the researcher

asked participants if they wanted to participate in peer-checking to review and confirm the data before the study was published.

After participants completed a consent form, the researcher contacted each person to schedule a time for the interview.

The interview protocol was tested on a pilot group for language, clarity, cultural differences, and time allotment. This pilot was conducted prior to the researcher's trip to New Zealand. An interview guide was used as the approach to the researcher's interviews. This allowed the researcher to "remain free to build a conversation within a particular subject area, to word questions spontaneously, and to establish a conversational style but with the focus on a particular subject that has been predetermined" (Patton, 2002, p.343). By using an interview guide, the researcher was prepared to use the limited time she has with each participant, and it made interviewing such a diverse group of individuals more systematic.

While in New Zealand, the researcher recorded interviews, and then, upon her return to the United States, she employed the services of an outside company to transcribe the notes taken during the interview. The researcher conducted a "fireside chat" with leaders from the MOE's e-learning team to summarize the findings and looked for patterns and common themes to help the researcher create codes for those that were found. The researcher also compared the patterns to the notes from document reviews to determine if there was anything that deviated from the interviews. From these results, the researcher made conclusions about the study.

Validation of the data gathering instrument. The validation of the data gathering instrument, the interview protocol, was completed prior to the interviews with participants. The researcher sent a letter to three experts working in the field of K-12 online learning at the doctoral level that described the study. The research questions and interview guide were shared in the letter. The experts were asked if they felt that the researcher would be able to answer the research questions based on participants' answers to the questions in the interview protocol. All three experts felt the answers could be reached with the interview protocol, and the data gathering instrument was used. A few comments were provided to improve the interview protocol and those comments were included in an updated protocol. The final interview protocol that was used in the interviews can be found in Appendix B.

Data analysis. "Two strategic ways that researchers reach new meanings about cases are through direct interpretation of the individual instance and through aggregation of instances until something can be said about them as a class" (Stake, 1995, 74). There were some parts of the interviews and document reviews that the researcher had to directly interpret. Some instances of data had to be pulled apart and put back together again in order to create a direct interpretation in order to understand the case (Stake, 1995). The researcher aggregated the data within pre-defined categories based on the research questions but was also able to define new ones as more was learned during the interviews. Based on the findings during the case more time was spent on one strategy over the other in order to better understand the case.

Finally, a narrative account was written based on the direct interpretations and aggregations of data from the researcher's interviews, observations, and document reviews. Stake (1995) states:

> Our readers are often more familiar with the cases than we researchers are. They can add their own parts of the story. We should allow some of this input to analysis to help form reader generalizations. The reader will take both our narrative descriptions and our assertions: narrative descriptions to form vicarious experience and naturalistic generalizations, assertions to work with existing propositional knowledge to modify existing generalizations. (p.86)

In the narrative, the researcher focused on a more personal note, describing her experiences but also provided an opportunity for the reader to make naturalistic generalizations based on a shared description of their own experiences.

Verification

Merriam (1998) discusses how internal validity deals with the question of how research findings match reality. She quotes Ratcliffe on assessing validity in every kind of research.

> It should be remembered, he suggests, the (1) "data do not speak for themselves; there is always an interpreter, or a translator" (p. 149); (2) that "one cannot observe or measure a phenomenon/ event without changing it, even in physics where reality is no longer considered to be single-faceted"' and (3) that numbers, equations, and words "are all abstract, symbolic representations of reality, but not reality itself" (p.150). Validity, then, must be assessed in terms of something other than reality itself (which can never be grasped; p.202).

The term verification was used "instead of validity because verification underscores qualitative research as a distinct approach, a legitimate mode of inquiry in its own right" (Creswell, 1998, p.201). Verification of this study was accounted for by

incorporating the following five strategies: (a) triangulation, (b) member-checking, (c) rich, thick description, (d) spending prolonged time in the field, and (e) peer de-briefing. The combined use of these five strategies helped the researcher check the accuracy of the findings to strengthen the verification of the qualitative research.

The first and strongest procedure, triangulation, was used by the researcher using multiple methods to collect data. “With multiple approaches within a single study, we are likely to illuminate or nullify some extraneous influences” (Stake, 1995, p. 114). The researcher conducted interviews with officials from the Ministry of Education and secondary school administrators and teachers. These interviews confirmed the researcher’s observations of online learning. In addition to interviews, the researcher also reviewed documents and online content, which also confirmed the findings.

Member checking involves the researcher taking the current data and interpretations back to the people from whom they were derived and asking them if the results are plausible (Merriam, 1998). The researcher maintained communication with the interviewees to seek that their feedback was consistent with the researcher’s interpretations of the data. Each interviewee was first sent a copy of the transcription of their interview to ensure the translation was correct as some interviewees had a thick accent. After they had made any corrections, the researcher took the findings to write chapters four and five. These chapters were sent to the interviewees to ensure the researcher’s interpretations were correct. Any questions and feedback the interviewees provided was edited in the final version of the dissertation.

The use of rich, thick description was used to convey the findings. This description transported the readers to New Zealand's secondary schools and gives the discussion an element of shared experiences (Creswell, 2003). Because the use of a rich, thick description was used, the researcher enables the readers to transfer information to other settings to determine if the findings can be transferred to other settings because of share characteristics (Creswell, 1998).

As stated, the researcher had the opportunity to travel to New Zealand for two weeks to conduct the interviews. Spending prolonged time in the field gave the researcher an in-depth understanding of online learning in New Zealand's secondary schools. The researcher was able to convey details about online learning and the ministers, administrators and teachers in New Zealand that lends credibility to the case study narrative.

The final procedure that was used to help with the verification of the research was the use of peer debriefing. "This process involves locating a person (a peer debriefer) who reviews and asks questions about the qualitative study so that the account will resonate with people other than the researcher" (Creswell, 2003, p. 196). The researcher works in the field of K-12 online learning and located a peer who understood online learning and "who will keep the researcher honest, will ask her hard questions about methods, meanings, and interpretations; and will provide the researcher with the opportunity for catharsis by sympathetically listening to the researcher's feelings" (Creswell, 1998, p.202).

Summary

Chapter Three looked at the research methods, questions, and design of the study. Data sources and methods for collecting and analyzing them were discussed and the interview protocol was included in the instrumentation. Verification of the study was also defined and a process for how the researcher collected data was described.

Chapter IV: Findings

This chapter details the results of the data analyses conducted on information gathered via face-to-face and online interviews with employees within the New Zealand education system. The goal was to look at and try to understand the process, benefits, and the barriers of implementing online learning within New Zealand's secondary schools from a variety of perspectives. The chapter is structured around findings from each of the five research questions, and it incorporates data gathered through face-to-face and online interviews along with documents shared by the interviewees.

Restatement of the Research Questions

The major research questions that guided this study are the following:

1. What are the nature and extent of e-learning (current model of funding, technology integration, curriculum, teaching practices, student services, academic assessment, educational policy and administration, quality assurances, teacher training, current trends, and marketing and public relations) in secondary schools in New Zealand from 1998 to the present?
2. What steps were taken for New Zealand's Ministry of Education to implement a system-wide online learning environment across the country?
3. What is working well and what are any unexpected benefits from the way New Zealand has implemented the online learning environment in secondary schools?

4. What is not working well and were any policies abandoned during the implementation of online learning in secondary schools?
5. What does the Ministry of Education want to do more of in relationship to online learning in secondary schools?

Interview Sample

The researcher traveled to Wellington, New Zealand to interview the Ministry of Education's e-learning team. Due to the timing of the trip in January 2010, the researcher was unable to observe actual instruction of e-learning within the schools due to the schools being closed for summer vacation, but she was provided access to several websites being implemented to support e-learning in New Zealand's secondary schools.

Interviews were conducted with 18 members of the Ministry of Education's e-learning team, e-principals, and online secondary teachers in New Zealand. A fireside chat was also held with the Ministry of Education's entire e-learning team to review the common themes of the individual interviews. The demographic make-up of the interviewees revealed the following (see Table 4): 33% of the respondents were female (n=6) and 67% were male (n=12). The positions of the respondents were identified as working for the Ministry of Education (55%), working as an e-Principal (28%), or were identified as a teacher (17%).

Table 4

Characteristics of Respondents

Characteristic	*n*	*%*
Gender		
Male	12	67
Female	6	33
Professional Position		
Ministry of Education	10	55
e-Principal	5	28
Teacher	3	17

Findings

The members of the New Zealand's Ministry of Education's e-learning team's management were invited to participate in one-on-one face-to-face interviews. Each of the members accepted the invitation and interviews were coordinated with them. At the end of the researcher's visit to New Zealand, the Ministry's entire e-learning team was invited to participate in a fireside chat to discuss the common themes found from the individual interviews. In addition, each of the interviewees was asked to recommend e-principals and teachers to participate in interviews as well.

Each interview was completed in an average of 45-60 minutes. E-Principals and teachers were interviewed online via Elluminate and Skype software. All interviewees were sent copies in advance of the nine questions that were going to be asked of them.

While the number of interviews is small, they nonetheless clearly highlight the experiences and views of the people involved in the implementation of e-learning in New Zealand's secondary schools. Following is a summary of the interviewees' responses, which are grouped into the research question they specifically answer.

Research question 1. Research Question 1 asked: What are the nature and extent of e-learning (current model of funding, technology integration, curriculum, teaching practices, student services, academic assessment, educational policy and administration, quality assurances, teacher training, current trends, and marketing and public relations) in secondary schools in New Zealand from 1998 to the present? The respondents answered this question with five main projects that have been implemented across New Zealand which have made an impact on e-learning in secondary schools.

Virtual learning network. Eight of the respondents (44%) noted that the Virtual Learning Network is one of the key projects that have been implemented across New Zealand's secondary schools. The Virtual Learning Network (VLN) "brokers the connections between teachers and learners; joining clusters, schools, groups and individuals who are learning through online programmes using asynchronous and synchronous technologies for curriculum support" (Virtual Learning Network, 2010). This "school" showcases New Zealand's implementation of e-learning, providing "a rich and diverse range of courses, programmes and activities, from early childhood through to tertiary, are offered by New Zealand-based educators" (Virtual Learning Network, 2010) for 24 hours a day, 7 days a week.

In the early ‘90s, Interviewee #13 saw an opportunity to establish “what seemed to be a brokerage service that would help put these clusters [from the ICTPD Program] in touch with each other and share the courses and the capacity that they had in some of these courses with other clusters.” So that a student, for instance, in Otagonet could participate in one of the courses being provided from the CantaTech cluster which started up the VLN and made a business case of it and the MOE accepted it and gave them funding for it.

The “Virtual Learning Network officially started in 2002 at the OtagoNet School,” said Interviewee #1. OtagoNet is a collaboration of the “13 rural high schools in the Province of Otago, at the bottom of the South Island. Its purpose was to provide support for senior secondary school pupils who couldn’t get specialists teaching in their own schools” said Interviewee #8. “Since 2002, the VLN has now grown to about 15 clusters, with around 150 schools offering over 300 courses. Almost every rural area in New Zealand now has a cluster, which is also a community of those networks,” stated Interviewee #19. The MOE has seen a lot of growth in the VLN. Schools are collaborating to offer courses, ICT in the classrooms, and are starting the development of the National Education Network, although the state of e-learning varies, and depends on the principal and the teachers. “Areas on the North Island’s east coast have no access, so it also varies geographically” Interviewee #18 said which is also shown in the map below.

Figure 4. Virtual learning network clusters map. Adapted from New Zealand Ministry of Education. (2010). Retrieved April 30, 2010 from http://virtuallearning.school.nz/modules/page/printpage.php?space_key=2&module_key=430 [Map/Still].

Interviewee #1 stated, "the intention of the VLN site was for kids to come on and pick what course they want, when they want it, and how they want it, and enroll themselves, and it was part of the community." The VLN is a community website. The MOE is implementing it so that at the national level, each student can enroll, the MOE can relay that information to the school and find out how they did. Eventually this will all be automated.

With the MOE's recent revision of the curriculum, new partnerships have formed to offer music and foreign language courses. "Primary and intermediate schools have

been told by the government to teach a language, and obviously that's an issue because we don't have 2700 language teachers in high schools because the majority of them are quite small," Interviewee #1 shared. "So we have been running a trial last year for about 12 schools with a focus on the languages." Initially, there was no infrastructure or very little infrastructure to help. "So we started to use the online technologies to try and solve that problem and to try and get these teachers sharing across schools", said Interviewee #7. They now have New Zealand teachers teaching English as a second language to Chinese students, and alternatively, fluent native speaking Spanish teachers in Mexico teaching Spanish to and mentoring Spanish classes to New Zealand students shared Interviewee #13.

Because the schools are autonomous, the MOE does not play an official role in funding and providing support for the VLN. "The clusters are sort of autonomous. The ownership is very much at a school level rather than a Ministry level," said Interviewee #19. He continued, that "the Ministry does provide some of the Internet services". For example, the videoconference bridge, which was enabling them to connect to one another for the synchronous activities was very helpful. Without the MOE's funding, it would be a major expense for them to actually sustain, the videoconferencing bridging surface. There are a few other Internet services, which MOE provides, hosts, and manages. "Also we have got people in the Ministry who have acted as a central person to help coordinate and synchronize the activities across the clusters," shared Interviewee #19.

Several technologies have been purchased and implemented by the MOE and schools to use on the VLN. Interviewee #8 talked about Adobe Connect and Elluminate and found that "my lot found all that stuff on the web to be pretty useful. They really liked the idea that they had all the resources there at their fingertips." The teachers and students liked that it didn't matter whether they were at school or at home, they could just log on and, if the dog had eaten their assignment, there was always another one sitting on the web. Interviewee #14 shared that "Moodle is now being introduced." Interviewees #1 and #8 also stated that there are currently between 300-400 video conferencing units across the country. Interviewee #8 shared that "sometimes there are other video conferences on a one-to-one basis, and the other major means of communication, we're using email, text messaging, chat, Skype, and when I was involved, the cell phone, the landline, and, from time-to-time, the fax machine."

With all of these new technologies, teacher training was needed to work in these environments. Interviewee #19 stated, "Our teachers in our TaraNet are all face-to-face teachers who for one or two of their classes, they teach online, and ICT PD was used and has been used on an ongoing basis for training them and up scaling them." Interviewee #13 shared that:

> one of the things that we did very early in the piece with the Virtual Learning Network was develop a thing that we called our LCO handbook – LCO standing for Learning Communities Online. The reason it's significant is that the process of developing it involved getting a small group of people who were deeply involved at that stage in the process of being online teachers. And we collaboratively developed the handbook to say what is going to be the most use here to actually guide principals and lead teachers and so forth through the

> process of deciding what they're going to do around this whole participation in the Virtual Learning Network.

The teachers and cluster programs are now supported by a group of e-Principals. Interviewee #8 talked about how their roles really were to administer clusters of schools that were learning online. They were given some money from government to support those people for the first couple of years, with the idea that if schools found these roles to be really worthwhile, then they could collaborate and fund them themselves.,Interviewee #8 shared that this has been pretty successful so far. Most of the schools that had E-Principals, have decided to continue on them.

Each of the clusters are designed a different way. Interviewee #13 shared that

> each of the clusters that are involved have had to design, develop and negotiate their own way of, I guess, exchanging the value that they provide. So, for instance, the Cantatech cluster that I was a part of, their solution to that problem was that each school put $10,000 into the pot, if you like – a central pot. And then through the year, it will be the principal's association responsibility to keep a track on who was providing courses for whom and then try to divvy up some money out of their pot. The cluster took a much more sort of liberal view, and they said, 'Look, as long as each school is putting one course into the pot, then we don't hear how many other schools ask for that course because the cost is going to be the same for each school.'

And various other clusters would come up with other ways in looking at how their program was organized. Some have set it up so that each student is worth a set amount of money. That money is divided into eights. Three-eighths stay with the school where the student is – basically a home school. The other five-eighths are distributed according to where that student accesses the learning from. "Its source for fairly and equitably

distributing the money associated with the cost of instruction," shared Interviewee #13.

Another model, shared by Interviewee #19 was that he is

> employed by the 14 schools each contributing around about 0.1 of a teaching salary to enable a pool of funding to allow the whole coordination administration leadership of his cluster to happen. The Ministry has provided – the contestable funding, which is being provided and has however been important. So for example right at the outsets we did get funding for ICT PD, professional development, which did enable us to really sort of provide professional development for teachers who we were asking to teach in this online environment.

The clusters are provided the initial funding through the ICT PD program by the MOE, but must collaborate to develop the policy and budget to sustain the program after the initial funding ends.

The schools are set up with a video conferencing room for the teachers to teach and students to take courses from other schools. Interviewee #14, a teacher shared that for

> the last two years I've only had two senior students in my Stats class from this school. So, we fit at the table quite nicely, and they – they have their lessons exactly the same as the VC kids. It's once per week. So, each course has one lesson per week, typically. So, it's one entire week's worth of instruction crammed in to one hour. Then, the kids are loaded up with heaps of homework, and they have to be self-organized, able to study in their own time. So, they have an entire option line given to them for study for that one subject, and just the one lesson per work week. With my Stats kids, it's exactly the same. So, although they're here at the school with me, they have just the same lesson every week. So, we're all crammed into the one room. They get the one lesson, and I hardly ever see them. They're here at the school, but unless they actually have any difficulties with the work, they just work on their own, at their own pace, under their own supervision.

This is creating a whole new way of teaching and learning in order to provide new opportunities for students across New Zealand.

With the policies in place, schools can now provide access to educational opportunities for all students in New Zealand through the VLN. Interviewee #1 shared that "most of the schools are running 25 classes a week. So we're averaging right about 6000 video hours a month with about 3000 visualizations."

Interviewee #8 said,

> so these rural high schools are typically small; some of them are under 200 pupils, with small cohorts in their senior years. Youngsters didn't have too many options once you got past Year 11. So then, for Year 12, those subjects are teased out and covered in greater depth individually, and then you do Year 12, Year 13, and then go on to tertiary study. So in Year 12 and Year 13, these rural high schools didn't often have specialist teachers. Because of the nature of the schools, they often had sort of generalist teachers or teachers who primary school trained and didn't have specialist skills.
>
> In a town of, let's say, up to 100,000, I'm just thinking of Dunedin as an example here, up to – which has got a population of about 110,000, and has about seven high schools. You might only have one Latin teacher, but you might have a number of kids in that area who want to do Latin. So now what they've done in Dunedin, they've put their own videoconferencing network in place, and again, they're sharing these specialist teachers that are in short supply. If you have web connectivity, and you have your course sitting up there in the cloud, then that solves all of those problems, and again, it doesn't matter if you're in the States or New Zealand, or whatever, you can just continue and get on with it. That's a pretty revolutionary position to be in. Where once upon a time you were tied down to one person being able to transmit knowledge to you, supported by textbooks that often had to be interpreted by that person, because they were difficult to understand, and now you've got all of the other tools out there that help simplify life.

Finally, Interviewee #14 shared the main reason the VLN has been so successful and sustainable over time.

> The idea is that the urban schools are big enough so that they can provide staffing for many specialty subjects that rural schools can't. Each school receives funding for certain number of staff based upon how many students they have, and it's tiered so that the more senior student is, the greater proportion of a teacher they're with. You need several students to warrant one full-time teacher – that when you

> get to your 13's, then it's a one or two students per teacher. There's a whole equation, which the Ministry work uses to calculate how many staff a school is entitled to. Rural schools tend to be very bottom-heavy, and low in the number of students. So, they have a bare minimum of staff, most of whom teach at least two different subjects, but whether a subject is vital depends upon enrollments. So, for the average rural school, if we have just two or three kids who want to take senior subject, then it's not worth a school devoting a teacher for that time to that subject. So, that subject typically is not available.
>
> The video-conferencing network allows students to stay at that school, and study subjects that they would ordinarily have to travel for. The school that I'm at – Kelso Turangi School – I'm not sure if you're familiar with the geography of New Zealand at all, but where we are, we're an area school, which in terms of administration means that we cover all year levels from new entrance, you know five-year-olds, through to your 13. So, we have students all over, and where we are, we're only about 30 kilometers from the Plymouth. So, for many students that's a bus ride.
>
> Traditionally, we have been in competition with the New Plymouth Schools – the urban schools for students, because a lot of families just send them on a bus to the city schools. So, as a result, there has always been a limiting factor on how many students are enrolled in the school, and we can't then, grow. We're then not entitled to so many staff. So, you end up in a cycle. We're not entitled to so many staff, so the number of subjects that we can offer is greatly limited. So, that encourages more students to leave to the city schools. So, for us being part of the video-conferencing network has been vital to a long-term viability, because we have a much greater retention rate for students in the senior school.
>
> So, for students that we have who want to learn a senior science, instead of saying, "We have to get on a bus, and go to another school," they know that they can study with a teacher from another school through the VC network, and for any tutorial assistance, then I'm available. So, the same with other subjects – we have some kids learning history. So, there are one or two teachers who can help them, but their actual class lessons are through a different school, and all of these clusters are coordinated by the Virtual Learning Network, which connects students with classes, students, and teachers nationwide.

But it was the genesis of pulling all that together, and “we’ve seen the use of those sort of online communities that started in rural New Zealand are now starting to spread into the city areas, where the drivers are a little bit different”, said Interviewee #8. They believe it really has to do with quality teaching and better outcomes for kids, but,

for example, in the rural areas, there are a lot of missing subjects and teachers; whereas, in the urban areas, there tends to be a lot of specialist areas, for example, teachers of Latin, the classics, or Spanish. So, as Interviewee #19 describes, "in fact the particular model of e-learning we're using provides students with space for them to take charge of their own learning and student controlled learning to really start happening." They are now developing a lot of the really valuable life-long learning soft skills which are going to be vital for them beyond secondary school.

ICT pd. The Information and Communication Technology Professional Development (ICTPD) program was shared by eight of the respondents (44%) as one of the oldest e-learning projects in New Zealand.

In New Zealand in 1998, the ICTPD cluster program began, and it has a very strong overlay with what's been happening with these video conferencing cluster schools" according to Interviewee #13. "Under the ICT PD initiative, clusters of schools throughout New Zealand are contracted for up to three years to provide ICT professional development programmes for teachers" (Core-ed.net, 2010). The Ministry provides initial funding to set up these clusters and several of the VLN clusters have been formed from this program. "The intended outcomes of the program are:

- Implementation of the New Zealand Curriculum / Te Marautanga o Aotearoa through school-based curriculum development;
- Increased e-learning leadership and ICT strategic planning capability of principals and teachers;

- Increased capability of teachers and principals to improve students' learning and achievement through e-learning;
- Increased understanding of the educational contribution of e-learning by teachers, principals, students and school communities;
- Strengthened professional learning communities and increased collaboration within and across schools (Core-ed.net, 2010).

A total of 267 clusters are currently active or have gone through the program since its inception in 1999. According to several of the interviewees, ICTPD is New Zealand's MOE flagship program, which started with indirect education in 1998, and is still running today because PD was seen as a crucial part of education early on. It's New Zealand's longest running professional development program in any one subject area "because it fits within the previous approach to PD which was around areas of interest – ICT, assessment to learn, those sorts of things," said Interviewee #4. According to Interviewee #7, "the focus is on the teacher first and teaching in the schools. When we're engaged, particularly around the virtual learning network, then the start point is really the teacher and student engagement, or the learning that is going on, and how do we support that which happens through PD."

Initially, schools could bid for money from the MOE, which totaled 120,000 dollars a year for three years, for a total of 360,000 dollars. "The schools had to design their own professional development approach and describe what they were hoping to do, and all of money had to be spent on professional development. They couldn't spend any

of it on hardware and software," according to Interviewee #13. Now, "about $10-11 million a year goes into the program each year", according to Interviewee #3. "Quite a lot of direct funding and also school support services which are essentially a network across the country of facilitators working out of universities," shared Interviewee #4.

Now that the program has been running for over ten years, and it's been significant as one of the sources of initial seed funding for some of the secondary schools who have participated in the video conferencing clusters.

> "It's important to understand that where there has not been any formal funding or policy support or direction of any kind, really, for the video conferencing clusters until much more recently. And even then, it's come as a little bit of an ad-hoc knee-jerk reaction in the last two and a half years when the unions and the groups of schools made a submission to the ministry for some support," according to Interviewee #13.

To describe the program, Interviewee #4 shared that

> It's basically worked on a policy of equity by inclusion and that means that schools generally are prohibited from repeating the program. It's a three-year program and it's until recently – and still does, to a very large extent – 99 percent – focuses on coalitions of the willing – to mash up a former President's statement – where schools will form clusters together based on local contexts – whether that's the communities they serve, the principal, working groups, and so on – to form clusters of schools to run a professional development program around ICT. Those could be horizontal, primary or secondary, or a mix of the two. You might have one lead secondary and a couple of primary schools kind of feeding together – so, you might have a little cluster of four.
>
> We go from one school through two, with about 15 schools as the largest. For example, the Correspondence School is one organization. It has its own sort of internal cluster. It is a cluster program, but how I've kind of pushed it in the last year is to fray that a bit around the edges and call it more of a collaboration program as opposed to specifically in that cluster of schools talk about it being more about the exchange of learning between interested parties. The research which has come out of the program in the last ten years has consistently said the advocacy of the program within secondary schools is less than within primary schools.

> Potentially from their size and scale, their culture, their structure, the siloing of their curriculum areas, the constraints around time-tabling and bells and periods which kind of helps cement all of that together.

Interviewee #4 shared the core idea of the program, that "it's about the ownership and authenticity and saying, "Yeah, you're the best people, best place to make this change. We want change around ICT. Here you go. Here's some money to do it." From a policy point-of-view, it's around a system change of putting in expertise and investing across the system and then we put in a team – this was like a national facilitation team – which oversees 15 to 20 projects each. They kind of have a mentoring and monitoring role in terms of steering the programs along as opposed to just going, "Hey, here's the money. Just write back to us in three years and see how it's going."

On paper this looks good and the structure works, but as with any system, there's always gonna be waste. They put some support into it, but they all start at different levels so they're all going to end up in different places. "There are quite a lot of variables that we can't control. At the other end, there's not waste as such but it's difficult to know exactly what we're getting in terms of the value for money proposition," stated Interviewee #4. "There will be some projects that work really, really well; others where it won't; others where some are working well and others it's not within the same cluster."

There is no set curriculum for the ICT PD program. Interviewee #4 shares that this is because at the other end of the scale you'd be saying, "Right, okay, the typical government thing is to control and measure and check for progress and so on," and at the other end if you were saying, "Well, that's a better system. You're spending all our time

controlling and monitoring and measuring, etc., and not actually getting the outcomes that you're after." They do not have a curriculum, they work on principles of PD and we try to work with people around those principles. "I guess over the ten or eleven years, those have become better understood as more formal kind of research understanding about what makes good PD." The MOE lets the teachers and schools know that "This is your program. You don't know what you don't know, but soon you will and then you won't know something else. We know more than you. So, let's get together and see where we go from there." And we try to encourage people to use good project management and so on – set good program goals," shared Interviewee #4.

One of the sustainable programs that came out of the ICTPD program was described by a former principal of a school participating in a cluster, was the Tech Angels. Interviewee #5 shared that

> I saw that project [ICTPD] I guess from the inside as a principal of the school trying to create change management around the things that teachers did, and the way the student worked. And one of the very key things that we came up with, was in fact, that actually young students were going to be instrument with the change processes that we needed to submit for teachers, and we set up a program called the Tech Angels Program, which was where teachers could use students as mentors, and so they worked collaboratively, and that in fact became one of the richest things I think has happened in my teaching career because what happened then was you actually changed the whole culture because suddenly students were coming to the learning process as equals, not as subordinates or not where a teacher has a position of authority over them. And the learning that we gained out of that in terms of the best environment for learning to happen was also, in the 21st century, was also quite remarkable."

As the program has grown, it is constantly being reviewed for improvement. Interviewee #4 shared that:

> In primary, smaller organizations – a different approach to PD in terms of having multiple threads for developing their PD, cross-curricular approach so they're working with teams with different areas of knowledge strengths and relative weakness, and more freedom with timetable and those sorts of things. In the secondary environment where there's a perception of not messing with stuff. They've got a particular culture of success, which we want to project out to our communities in terms of attracting students and being more competitive with other colleges. I'm sure whatever it looks like is not just around ICT, it's around change with secondary schools and leaders and their role, etc., which comes back to that idea on focusing in on an individual school and therefore, better understanding what's actually happening there.
>
> I think within the primary clusters, you end up with more leaders around a table and perhaps a different collegial atmosphere – but more leaders because they're smaller organizations and they're a range of different skills and to choose someone within there. Whereas with a secondary cluster, you're gonna have less and it's more of a competitive culture. The competition doesn't exist here because people want to go out of zones."

The MOE also recently added a national program for new principals. So in their first year, they'll do a year's course. And they do a leadership capability model with them, and they find that the ICT component scores really highly. So they self-assess themselves as being very capable and confident and knowledgeable in ICT, and then, they do the same test again at the end, and they find that it's the lowest scoring or one of the lowest scoring. So over the year, they've actually realized that they – I don't know exactly what that is – but it's, "Oh, crap, this is a bit harder than we thought it was," or, "Actually, we now know that we know what we don't know," sorta thing, now. So their actual confidence in that area drops off," shared Interviewee #4.

The model used to deliver the ICTPD is blended, but a significant amount of it is face-to-face and we have research to show that generally, that is the mode that people still desire. "Online learning is problematic but has a place. But it's not a panacea, but it's

basically saying, Yeah, we definitely have a role for more modern, different ways of communicating," according to Interviewee #4.

And according to Interviewee #5, "this hasn't happened systemically from a top down level, but it's happened from a practitioner level, and in fact, I believe that that's probably the way you create the fastest change anyway, so that's fine." "And New Zealand has taken the approach to foster the school-based grassroots, if you like, initiatives, and not to come in over the top of any kind of large-scale, national intervention. Although, there have been a number of national interventions that schools have been able to take advantage of, such as the laptops for teachers program and so on. Innovation and ingenuity, and probably a high level of ownership at the local level of the outcomes of all of the programs," according to Interviewee #13.

> But it's not evenly distributed. We have to now do some catching up by getting a policy around some of those things that should be happening at a government level – the reality that policy actually starts from innovative practice, and then you probably get the match happening between the two to create a positive change environment or a virtuous change cycle, said Interviewee #5.

TeKura, the correspondence school. Five of the respondents (28%) discussed the Correspondence School as an important example of e-learning in New Zealand. "Te Kura is New Zealand's largest school, with more than 24,000 students a year studying full or part-time, and staff based around the country" (TeKura, 2010).

The school has been around since 1922 and provides a personalized learning experience for early childhood students to adults across New Zealand and the globe. According to Interviewee #10 the Correspondence School enrolled approximately 24,000

students last year. “They’re not necessarily all engaged with the school at any particular time. All of the school covers year – early childhood right through year 12 and also provides pretty much the same subject range as what any other school does.”

Interviewee #4 provided a short description of the Correspondence School population, as

> they have adults; they have full-time students who are home schooled; and they have jewel students – primary jewels and secondary jewels which is the area of interest for you. So, they have full-time students who may be isolated but who are also disenfranchised from schooling – school phobics, might have disabilities, might be excluded, and embarrassed of learning, social and so on. So they’re home schooled. Then you have secondary jewels, which are a significant proportion of the secondary cohort where they’re filling in for the secondary school’s needs, such as a school might not have a physics teacher in a particular area or might not be able to offer Latin or something like that – or their teacher phones ill, so then they’d be covered by Correspondence School and schools have the option to do that. There’s also Young Parent Institutes as well. Young parents often use the materials to then deliver them in young parent units.
>
> You also have at-risk students. Alternative Education – AE maybe. They’re associated with colleges and but they’re for at-risk students who are identified with having some issue or problem which means they can't be mainstreamed. So, that is a significant proportion of their schooling. There are also urban, underserved communities to parents of kids that are in the mainstream to parents of kids who are phobic or whatever.

The school is still heavily a correspondence program, but is gradually transitioning to more online learning according to several interviewees. The school was initially set up as a transmission model with communications going and booklets being filled out and coming back and the organization was built around that and now they are changing or trying to change into a 21st Century model of learning. “Because of the slow transition out in the sector, you’ve got people then responding to the level of service that

they're getting from the Correspondence School and looking at alternative ways of serving their communities, " shared Interviewee #4.

The technology infrastructure is also important to the Correspondence School. Several changes in addition to changing LMS are happening according to Interviewee #11.

> we are replacing all of our infrastructure in this organization, and that includes student management system, doing it for online teaching and learning environment, and our electronic book management systems. The project board for that, and we are [inaudible] around that in a million dollars in this new system. And we were unable to find – and for two of the systems, anything in New Zealand that would accommodate our needs. So for our student management system, we have a system that's a specialized product. It's called Integrator is vital to the organization.
>
> None of the products that are available were able to accommodate the needs of personalized programs. Virtually everything is aimed for cohorts of students, and we don't teach cohorts of students, and, you know, if you're going to get into the kind of realm of personalizing learning, then every student's a cohort of one.
>
> It has cost us a lot. We've currently got our own spoke system which hasn't worked for us that successfully, and we've now got this product which has had to have a lot of modifications to coordinate our needs. In terms of the leaning management system with the online learning teacher environment, again, we used to use Blackboard, but that didn't reach our needs. So we've now just implemented Desire2Learn.
>
> So other infrastructure things that we are – I think that in terms of creating infrastructure within the organization, from what I can see and hear, we are pretty well set up. We still are a little behind in some of the technologies that we use – I mean we haven't really mastered things like using cell phones appropriately. We also haven't mastered using things like Facebook and Twitter and that sort of stuff, but I think people are really open to doing that.

The school has also invested in a Learning Management System (LMS) and is recently transitioning from Blackboard to Desire2Learn. Interviewee #15 "didn't feel that Blackboard was suitable for what we wanted to deliver for. We used Blackboard as a

supporting tool for any sort of mapping or discussions and things like that." All of the interactive learning has been done on this system, but the courses were originially delivered through the website. Now, they are in the process of moving all of the content onto a new system, which will be Desire2Learn. They have created a couple of pilots. Interviewee #15 stated, "Our focus this year will be implementing a new menu system, and deciding what we're gonna put on there."

At present, there hasn't been a lot of structure around e-learning. There have been some teachers who have really used it a lot and others not at all,a lot of extremes. "But there has been no real consistency applied to what I've done and seen in an E-Learning sense at the Correspondence School, which isn't ideal," according to Interviewee #10.

At the Correspondence School, Interviewee #15 stated that,

> our whole learning happens in a variety of ways, but with a face-to-face school generally what they do is have the e-learning as supplementary work, and ours is quite different," according to Interviewee #15. "For us there are a few courses available on Blackboard that are totally dependent online and we have a number of courses, that are on our current Blackboard system that are offered to students, and it's mostly senior students at present. I think we've probably got about maybe half a dozen that are fully online, and the others are used for like I said before sort of support and documenting – supporting parts of it of those courses. Some of the subject areas use blackboard in a big way and some don't.
>
> We have about 12 teachers currently teaching online and maybe more and I think we've got about 150 students online. But our intention this year is to double those, and we had quite a big push at the end of the last year getting more students enrolled to the online courses at that year level between 7 and 10, and we have a lot more teachers now, which is great. And we sort of started the cycles on that very much in the last 12 months and built that. Previously to that we had an online group of teachers called Connect Audit and that only served the years 9 and 10 whereas Chattaho year three – 7 to 10 and then year 3 to 6.

According to Interviewee #10, most of the online content is PDFs of booklets right now. It's not really designed for an e-Learning context. Interviewee #10 stated that, "the school's done all they've done this way for years, I guess it's quite a gradual process. Probably the first thing we'll be building will be PD and augment some of the online courses." They are doing this in two parts. Initially, one will be internal, which is building PD around some general e-Learning information and tools. The other one is for feedback and some promising practices out of things that have been done at the school which have been successful.

Interviewee #11 added that in addition to the online professional development they will be offering they have a contract with the ministry of education as one of the ICT clusters. They are unique in that they are a cluster because they have such a large staff. Normally an ICT cluster would include a number of schools and managed by one school. Interviewee #11 shared that, "in our case, because we've got over 500 staff in the organization, that we're a little different."

Interviewee #15 added that "we are also setting up what is called online essentials so that students can understand things about safety, how to behave online, how the courses work and that sort of thing, which we're going to be teaching very soon." Previously there wasn't a lot available for their students in regards to how they would learn online, but they are developing it now for their new system.

Laptops for teachers – TELA. Four respondents (22%) talked about the TELA Scheme and its importance to the implementation of e-learning in New Zealand's secondary schools.

The TELA Program was started in about 2002, according to Interviewee #6. "In the fall of 2001, the government provided funding for the administration to take a three year lease on laptop for teachers and all principles in state and state integrated schools, and they were to be subsidized.

Interviewee #3 explained how the MOE is running a $20 million a year laptop program. "We provide every teacher a laptop. This is a voluntary program, so every teacher who wants a laptop, we pay two-thirds of the cost of the laptop, and then the school pays the other third. Currently, we have about an 89% take-up on those laptops, so it's quite high we think." The MOE calls this the TELA Program. Each principal is also given a new laptop every three years.

According to Interviewee #6 shared about how they have contracts with three laptop providers. These include a contract with a finance provider who does the leases on the laptops because the school holds the lease on the teacher's laptops, whereas the administrator holds the lease on the principal's laptops. They are essentially responsible for the payments, and returning them, and everything else, and the MOE provides unding directly to the finance company."

The funding comes at the national level, so it's essentially funded forever even if there is a change in policy or if someone gets a different idea about how to do things. "So

yeah, at the end of the three years they can essentially – should be returning the laptops to the finance company, or the finance company at the moment is giving them the option to purchase, shared Interviewee 36. The MOE prefers the schools to replace the laptops with new ones for the teachers, rather than them hanging onto them for another couple of years. "And as we understand it, the majority of schools are doing that," shared Interviewee #6.

> Because we bought laptops for teachers, they have been more excited to implement technology in their classrooms. It's a bit like if you send everybody in America on a defensive driving course, that's a good thing, but if people don't have a car, they're going to say, "Good thing I can drive, I don't have a car," explained Interviewee #3,

and Interviewee #6 "believes there was some professional development in the original program. Well, initially, the TELA Program had a requirement of 40 hours professional development, and it was sort of – the questions came up well, what do 40 hours mean?" Because the schools are autonomous, the Ministry had no way to track it, so the required PD was abandoned.

Interviewee #3 also shared that "one of the things we have done since the TELA Program started is we've run a research process that's been run by Otago University, and also, I think, by Waikato University." They have about 45,000 teachers in New Zealand participating, and there are about 40,000 laptops from the TELA Program being used with this group. They have looked at the impact of providing laptops for teachers and the effect that that's had in terms of P.D. for them and exposing to the technology.

In the survey, they asked, "Has the TELA Scheme had a positive effect on your school? 73% strongly agreed, 23% agreed, 2% were neutral, 2% disagreed and nobody strongly disagreed" encouraging the MOE to continue the program (New Zealand Ministry of Education, 2010b).

TKI website. Three of the interviewees (17%) shared the importance of the TKI website as the final project related to the implementation of e-Learning in New Zealand. "TKI is a bilingual portal and web community which provides quality-assured educational material for New Zealand teachers, school managers, and the wider education community" (New Zealand Ministry of Education, 2010b).

Interviewee #3 explained that back in 1999, in addition to the ICT PD program, they set up a bilingual teacher resource center that's called TKI at TKI.org.nz. When people go to the home page, they can access the site in English or in Maori, so the idea from the start was that it was going to be a bilingual resource. The idea of a teacher portal was that there would be quality resources for the courses there, so that if you were an English, Geography, or a math teacher, you could go to TKI, instead of just going to Google and typing in Amazon Rainforest, and getting 50 or a million sites, there would be 25 sites that pop up that had been selected as being suitable for their curriculum by the MOE. Interviewee #7 described TKI as "New Zealand's equivalent of the MERLOT site, providing online resources, but an obviously much smaller and more central system."

Interviewee #7 stated,

> TKI, it's basically – well it started life as online resource materials for teaching and assisting teaching, both teachers and also in their own professional

> development. Initially it was very much focused, in pre-Google days, on helping people connect to appropriate resources. So there was a lot of searching the web, finding really good educational resources, writing data about them, putting them into the database so then they when discoverable by teachers and contextualized in New Zealand for both local and International materials.
>
> With the advent of Google and other more sophisticated systems, the focus of TKI has moved away so much from the kind of oh here's the resource out there going and use it kind of thing to much more a vehicle for communicating quality assured resources and ministry initiatives and strategies around education and learning. So it's become kind of a channel really for – but very much targeted at the teachers in the classroom or heads of department, all those sorts of things.

TKI also had a sister site called Educational Leaders, which was targeted more to support for principals. "That site was going through a major redevelopment and the ministry was running a whole series of projects around how to deliver websites and document management and a whole lot of things, all of which went belly up," shared Interviewee #7.

With all of the advances in technology, Interviewee #7 discussed how the Ministry of Education tried to clean all of that up and actually come up with the idea of TKI being a federation of sites. "So it focused on branding identity so that people would recognize that this was an educated quality assured, ministry assured, quality assured website that had material that was supported by the ministry," stated Interviewee #7.

The new site:

> includes some forums and mechanisms whereby you can engage with each other online. Here's TKI, and here are subareas of TKI that are focused on specialist areas. Here are software of learning as much as a website and the software of learning, you will get access to the – at the lowest, simplest level. Here are a whole bunch of reviews of open source, shareware, freeware type applications that you can install on your local school, and this is how the teachers are using it. Here are some case examples around how that – how the piece of software might be used, Paintshop Pro or whatever it happens to be. Here are public access

> websites that are focused on web collaboration and engagement. Here is Wikipedia. Here's blogger, etcetera. This is how you might use it in the classroom. These are the issues about using a public access system. This is what you need to be aware of. This would be good to use. This wouldn't be good to use. These are some case examples, that kind of thing to provide advice and guidance to teachers around using that kind of content, shared Interviewee #7.

The Ministry of Education is "working alongside schools to help them, some of the schools flying out of the ITCPD, but we are helping them really pick up the information advices and software for TKI and then use that to create online learning situations in the classroom for schools," said Interviewee #7.

Interviewee #8 shared the following story to demonstrate how the combination of the TELA program and the TKI site helped in the classroom.

> I was teaching a Year 11 course in Black Civil Rights, and Martin Luther King's *I Have a Dream* speech. So the kids had a textbook, and the textbook had a little extract from the speech, see, so I read it with my "be sorta Martin Luther King" voice. A boy at the back of the class put his hand up and he said, "Where's the rest of it? This is only a little bit." I said, "When they make textbooks, they can't put the whole," "Well, can we go to the library and find the rest?" I said, "That sounds like a good idea." So they went off to the library, and my sorta reference book in that space probably was the Encyclopedia Britannica, so that didn't have any more of the speech either. So he came back and said, "I can't find the rest of the speech." I said, "Well, you get on with your work, and I've got this new laptop, and I can go onto the Internet." That was before Google and everything.
>
> I think I used the TKI site, but anyway, the power of it all, within ten minutes I had found the whole speech, and I had downloaded it and printed it off. I actually found an audio clip of about ten minutes of the speech, and I also found a little video clip of about two or three minutes of the speech, so I printed off the whole speech.
>
> Then the kids clustered around – I had about, it wasn't a big class, probably about 15 kids – we all clustered around the laptop screen and we watched Martin Luther King deliver part of the speech. You could get, from the body language and the people who were gathered around in the back, all chanting and yelling out support and that sorta thing, you got a real sense of the occasion. Then the camera swung around over the reflecting pool and everything, and you got an idea of all the people.

So, as Interviewee #7 states, “it’s very much active engagement, participant observers in some of these programs really. And subsequently, we’ve added about 8000 digital assets.”

Several other programs were shared by all of the interviewees; however, the above were biggest and most sustainable projects. Interviewee #7 shared that “you can get a cross of things and you can also see the connections between pieces of work, that if you were just focusing on the VLN or one aspect of the VLN, it would be easy to get siloed.” But when you’re trying to keep across all those things, it’s much – and then you’re on a day to day basis, mixing and socializing with people in the same world.

Interviewee #7 talked about how in some places there are really innovative things going on. In other areas – you can go to a school and there is only one teacher that is doing something that is really innovative and everyone else in the school is not even aware of what they are doing. As Interviewee #3 stated, “there’s been some constant things, the PD Program and the laptops and TKI, and then there’s been some new things that have come along, depending on what’s the flavor of the year.”

Research question 2. Research Question 2 asked: What steps were taken for New Zealand’s Ministry of Education to implement a system-wide online learning environment across the country? The respondents answered this question with four main projects that have been implemented across New Zealand which have made an impact on e-learning in secondary schools.

Virtual learning network. Interviewee #13 shared:

> I set up a distance teacher program through New Zealand, which is still going today, and so, in 1994, I teamed up with Carol Moffat. She had been the principal at Oxford Area School. And in the political climate of the day, Oxford was among a large number of smaller, rural secondary schools that were under threat of closing because of falling roles and the government of the day were talking about closing schools once they got to a particular threshold.
>
> We managed to get some initial support from Telecom and a little from the Ministry of Education. And she was really the key driver behind it. I just did all the design and professional development work and set up what was called then the Cantatech Project. That began in 1994, and that's still running today. So that was, I think, initially serving small, rural secondary schools – sharing classes using audio technologies. So you had two telephone lines into each school, and that was really the beginning of that crisis.
>
> That continued right through the 1990s, and I continued to have a role in that and particularly in the professional development side of things. I set up a course through Cambridge University, which ran for about 18 years doing the professional development for teachers who were just being initiated into teaching online using these technologies, an while I was there at the same time, a group in Otago looked at starting up another cluster a very similar program to the Cantatech cluster. They were going to start using video conferencing, and they had the support of Telecom to do that – to put in extra lines and so forth. That was the Otagonet cluster, and they took a lot of the lessons from the Cantatech cluster, and that's how I became involved with them. They approached me to help them again with the design and the professional development side of things there.

Interviewee #3 said they,

> came back to New Zealand in 1997. I said to our school principal, "We need to be doing more in this area [online learning]," because I'd seen how it could get kids interested and engage them in learning. This was really about 12 years ago. I became an e-learning advisor to schools all around the South Island, and instead of just doing it in the South Island, do you want to come and work in the Ministry and do it for the whole country?" So I came here at the start of 2002. When I came here there were three of us

who worked with schools around the country.

Interviewee #8 continued,

> the principals decided that they would use new technology to try and overcome their issues to access, so we put in a videoconferencing network, which was

> supported by an organization called the Otago Community Trust, which was a philanthropic group. They provided a lot of the money. Then we used New Zealand's big Telco, that's called Telecom, and they provided the virtual private network to link all the IP-based video conferencing units together.
>
> So that started in 2002, and the planning took from 2000 to 2002 to actually put it into place and get all the bits together, and to purchase all the equipment. So each school had a videoconferencing unit that was connected to a virtual private network, and then it also had the online presence. This was done sorta with the minimum connectivity needed to get it all to work, because the connectivity was very expensive, and so on.
>
> That was probably the first one that used videoconferencing effectively. The first sort of online cluster in New Zealand was a cluster in the next province north from Otago, a thing called CandeTec, and they actually started probably nearly ten years before. They used an audio graphics based system, which again was pretty cutting edge technology at the time. They had a sorta audio graphic system based on computers using dial-up modems and then an audio conference line as well.

Interviewee #19 shared that,

> initially back in 2001, I was Deputy Principal at one of the smaller rural schools in Otago and we were facing rural decline. I presume that that's a phenomenon in the states also, which was threatening most of the secondary schools in the region, the rural secondary schools. And as a group of schools, we established sort of this community of schools to teach one another's schools on a reciprocal sort of basis.

From there, Interviewee #1 shared that the original VLN cluster was called OtagoNet, which is in the middle of the South Island. They now had a video conferencing unit in each of the schools. Interviewee #1 stated:

> We identified needs of those schools as to what I needed to have supply for. As part of the group, each school had to drop a subject each and we identified teachers who were willing to do it rather than forcing the teachers where we had a need because it was about making it work.

We then identified a person that was an ICT facilitator or now we're calling them e-Principals, who kinda look after the E-learning, and they kinda look after the enrollment." Interviewee #7 added, "To date, it has been done very much on the basis of

there was an e-Principal in the schools. An e-Principal would kind of informally work with the teacher to get them up and running and provide them support."

Interviewee #8 said, "in addition to that, we put together an online space as a document archive, and for forums, and chat, and those sorts of things, using some Microsoft technology, using a SharePoint environment." Interviewee #1 continued that,

> We then created a website where we could put our time tables and then, obviously, you had to work with the school time table, then the cluster time table, then a national time table and have that worked so the students knew when to go to class. The nation-wide timetable was key to making this work. We had a nationwide agreement that schools sort of adhered to certain kind of rules obviously to get access to the courses that we were developing and they had to offer.

Interviewee #19 continued,

> we set up more a community of schools, with teaching one another, and we had our first year. And I think we launched with 12 or 13 senior secondary school subjects, a roundabout sort of 80 or 90 students. So they were quite small classes. It was at the same time that the last generation of broadband was being rolled out across New Zealand, so we sort of hitched onto that and decided that we wanted videoconferencing as our primary synchronous technology. So that sort of provided the backbone, and OtagoNet became sort of the first of the VC based online communities of schools or clusters, and shortly after this a number of other schools, other regions looked at what we did and decided yes it would work in their regions.

Interviewee #1 said,

> The participating schools didn't have someone involved to make sure they understood the kind of infrastructure needed to support kids, which was kind of missing.
>
> A lot of the schools were kind of wanting to become more involved in doing what they do rather than having it load from a central location and they wanted to have control in what they offered and what they didn't. As these folks came on, we built protocols and things as they came on so they had guidance and a little bit of support and all those kind of things. The elements were flexible and maybe changed as people come on and different needs are identified.

We are building an infrastructure now and sort of starting to define the official development needs using certain technologies and why do you need to help. We are now using Adobe Connect technology, web 2.0 tools and there is an engagement focus of student outcomes and user technology.

Traditionally, we had four periods a week, and when we started we went to one through the year, and the other three were supposed to be in a one-on-one environment, and that sometimes happens, sometimes doesn't, but then we can identify professional development needs.

People are asking should we push VLN. This won't happen because schools will resist. If you've got a school, or reputation, or name, or a certain way of working for the last 150 years, they're not gonna accept this, and that's fine. They will do it when they're ready, and if we build a framework around what they can do and how they should do it they will resist.

The other schools did not resist. As Interviewee #8 describes,

so that targeted cluster, OtagoNet really, one of the things that came out of it was other clusters around the country were growing at the same time, and the Ministry decided that they needed some way to sorta pull it all together, and that's how we sorta got the Virtual Learning Network (VLN) started.

So the virtual learning network started as a place where the individual schools could broker courses. So, for example, at the bottom of the South Island, there's not a lot of Maori spoken, but there are youngsters who wanted to learn how to speak Maori, and it's difficult to get teachers. So we did a collaboration with a school in the far north where there are lots, or a number of native speakers of Torea and we were able to swap classes. So the teachers up north took some of our kids for Maori, and we were able to provide some of their kids, I think, with economics or something like that, and we worked through the details – the Ministry helped us to pull all of that together. Now the Virtual Learning Network has a pretty extensive booking schedule.

Interviewee #7 shared that,

we are currently, in the moment, getting some of the people in the Virtual Learning Network to document in relative detail the trials and tribulations, what they've already been doing, but really synthesizing out of that the key lessons and the key experience, or the view that is the national geographic education network comes on board and more and more capability and then we've got a series of examples, case materials, pedagogical guidelines, etcetera, support materials for different – people in different teaching and learning situations and how they – what works for them.

According to Interviewee #11:

> we are going through the process of digitizing all of our main resources so that this is – I mean experts in E-Learning will tell you this is not E-Learning, but it does mean that we can email things to people. So it does mean that we can manipulate resources much more easily and update them and change them and make them more relevant, and we can address copyright issues far more than what we have in the past.
>
> The next stage is to make the more indirect implementation sort of stuff and that we're working on people being able to work online as they are still just doing traditional types of learning, and we hope with piloting this year, a few schools where we deliver to the schools, because we can – at least we can say the schools should have the technology to receive and integrate with us, and we try – met with specific – with schools to try and deliver to being online completely for and see how that goes.

ICT pd. Interviewee #1 shared that the ICTPD program began "ten years ago and it was about improving the capability of teachers and using ICT, which I think was the right thing at the time, but it's not the right focus now." Interviewee #2 shared that

> professional development has been ongoing. For the last ten years there has been a national professional development program, and it's currently going through a re-evaluation, and in part, that re-evaluation will be to align it more closely to the online potential that broadband brings.

Interviewee #16 shared that "there was an initial and ongoing investment in ICTPD including school cluster projects."

"ICTPD contracted things, significant for some schools. I think significant in terms of shaking the ground, in terms of their beliefs. For some, it took them three years to actually realize that there was change required," according to Interviewee #17.

Interviewee #18 shared that "ICTPD clustering has allowed it to happen within the schools e-Learning clusters which started in 2003. The funding for this helped with the technology and PD and those schools just started to collect."

TELA program. Before the TELA program started, Interviewee #3 shared that they looked at other countries around the world to research what worked and didn't with laptop programs. Interviewee #3 stated, "Most of the bad laptop programs were where some institutional jurisdiction had gone out and bought a laptop for every teacher, given it to them", and said, "You have to use them," Where our program was voluntary. We said, "If you want one, we'll pay two-thirds of the cost," and the idea of them paying a third of the cost was that they have some ownership. Not financial ownership necessarily, but they were making some investment, and it reflected the fact that people use laptops for things other than school stuff. Otherwise, if we paid 100 percent, even people who didn't want a laptop would get one.

The program first started in 2002. Interviewee #3 shared, "when we first started the TELA Program, we had a professional development program for the first three years, that's about 2002 – 2005, we had a thing in there saying, "You have to do 40 hours professional development." That, the responsibility for professional development is done with the school, and really, we had no way of checking." This requirement was later removed because the Ministry of Education had no way to verify that the professional development had been completed. The TELA program is still running successfully with 97% of the teachers participating.

Broadband (nen) and infrastructure. Initially, Broadband started with Project PROBE. Interviewee #3 stated that:

> the government started to roll out rural broadband. So the government had a program here that ran from 2003 to 2005, called Project Probe, P-r-o-b-e, and the P-r-o-b-e stood for Provincial Broadband Extension. The idea of Project Probe was they identified all the schools that had no broadband anywhere near them, and implemented it. So over those three years, we worked to provide broadband to over 95 schools. The idea being that each of those schools was in a community, and that if you supplied broadband to the school, then also, by definition the community would benefit. So there were some schools that weren't associated with a community, but there weren't many communities that didn't have a school.
>
> So, at the time, that was a 512k connection, so half of a Megabyte. I'm working on now, we're doing 100, because again, there's been the same increase in demand. The reason that 512k was okay then was because there wasn't much online service. There was no VLN, no TKI. It didn't have a whole lot of interactivity on it, it was just a whole lot of web pages.

The new Broadband initiative is starting to be implemented across New Zealand. Interviewee #2 shared,

> we're at a bit of a crux with state investment and online learning by the Broadband Initiatives, so significant funding is being placed into the provision of broadband for schools. There has been significant funding and entrust school infrastructure, so school wiring letting data move within a school. National Education Network is the next step up around that, providing a national broadband infrastructure.

Interviewee #16 said the goal of this new initiative is "supporting the introduction of ultra-fast broadband to all schools (primary & secondary)" and an overview can be seen in Figure 4 below.

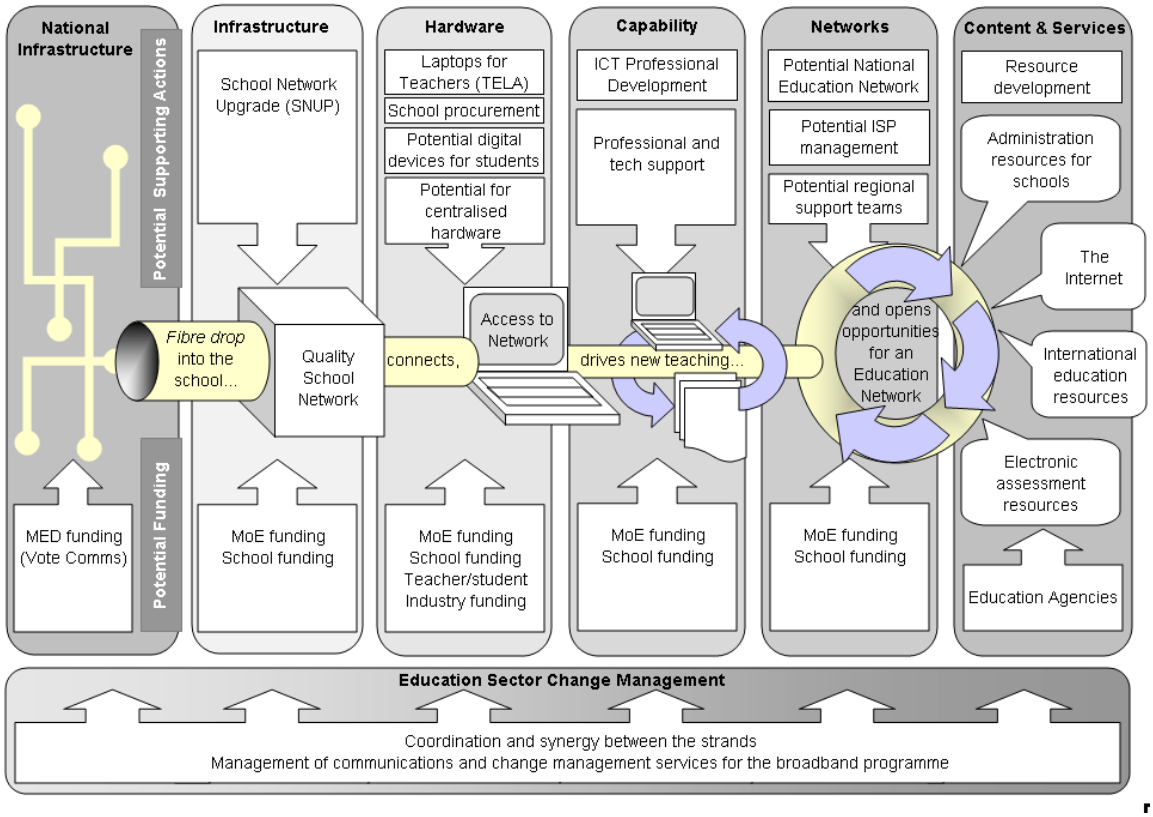

Figure 5. Management of communication and change management services for the broadband program. Adapted from "Management of Communication and Change" by the New Zealand Ministry of Education, Management Services for the Broadband Program. Copyright 2010d

Policy, funding, and leadership. The Ministry of Education in New Zealand has played a key role in implementing these projects. Interviewee #2 stated that "money has been made available, and policy is being implemented to spend that money wisely."

Interviewee #7 shared his story of how the history of the MOE's involvement in the implementation of e-learning.

we worked with all those various owners to try and get them to operate as a collective whole, even though they're off writing individually and were increasingly techniques for getting to serve off similar environments and lever off each other's development and actually just a whole lot smarter.

Then there was quite a real reorganization that was quietly going on around the e-learning team. The e-learning team, when I first joined, was quite small, and really had grown out of one person, Murray Brown, who people might have mentioned, who was the single person that was responsible for e-learning in New Zealand. And very much, our team had grown fairly haphazardly around various projects that were going on, and Murray was at the center of all of those things, which worked because Murray was at the center. He had his fingers on all the pulse. But no one else could work it because they hadn't grown up with it, so they were coming in cold. So before Murray left – Murray left a couple of years ago, and before he left, he started to realize that there was a need to change the structure a little bit and to focus a little bit into clusters of related activities, as it were.

We identified the four main clusters and tried to move down the track of putting team leaders or a person in a leadership role, in relation to each of those four areas. One being around research and innovation, and it was very much focused on let's get the latest research, what's happening, let's make sure research is happening around what we're doing, that kind of thing. What is the Intel around all this and connecting us up with various other International bodies.

The second group was like the capacity or capacity capability, capability group, which is very much focused on assisting teachers, professional development around the use of ICT. There was the online services bit, which is the bit that I'm theoretically leading, although I'm usually following my renegade bunch. And that was very much focused on the – formerly on the types of online systems and applications and software, etcetera that were being used by teachers in the classroom, and arranged from things like learning management systems through to more public access websites through to video conferencing, web conferencing and all that stuff.

The other area, before coming back to that, was the infrastructure, wires and cables and making sure schools had the network capability, and the underlying driver that we had, the four major government initiatives around broadband and all that sort of stuff was that we needed from the International literature and from our own kind of thinking and working, we realized we needed to take all those four areas, four together because if we got any one of them out of sync, then what would happen is we would be in a situation where either we'd have infrastructure out there that no one could use or we'd have people out there restless because there wasn't – they actually learned all their skills and they couldn't apply them in the classroom, so they get frustrated. Or we'd have a whole bunch of flash services that wouldn't actually work fast enough and people

> wouldn't know how to train or trained to use. Again, we would have no Intel on it all. We have far too much Intel [inaudible] as you're doing anything.
>
> So we really needed to keep those four areas of activity in balance, and that's kind of the model we tried to pursue. What theoretically should have happened was that we were going down the track of restructuring and moving towards, in each of those areas, having a team leader. And then around that, have various senior advisers and support staff to work with a team leader who would then report to the manager who would then report to Colin. And that's a good structure. And it worked really well. But bits have kind of passed us by. And with all these other developments going on, I think we are kind of getting there, but we're not properly implementing it.
>
> The overall strategy we're really trying to employ there, what we're trying to build up is a series of guidelines, best practice resource materials, key experts around the country who have done these pieces of work and then can be used by others, contacted by others to share their learning, what worked, what didn't work. Then we can actually take some of the learning from those.

Interviewee #3 shared that "in terms of policy, our first policy document was in 1998; that was the first of the ICT in education." At the time all of the government was supportive of ICT and e-learning and they gave $40 million to the cause at that time. It was $40 million in upfront money to initially fund ICT. The next policy document, Digital Horizons, was created around 2003, and the government supported it by giving about $60 million to implement that.

Interviewee #5 explained that:

> there's a whole lot of circumstances that need to be right before change will be implemented, from particularly, at leadership level. You've gotta have leaders who are open to risk taking who are collaborative in the approaches, there's a huge amount of expertise amongst younger people that needs to be utilized. So it's establishing ways of working that are team based and collaborative, where people don't stand – who can put aside the role they might have as a principle to show themselves as a leader to because it's another condition. We know that if leaders show that this is really important, and in fact they don't have all the answers as well, then we know the uptake is going to be ok with teachers too.

A lot of it is about identifying from research, the things that enable the stuff and importing those with things in practice, really. So leadership's one thing, giving practitioners the time to adapt new practices, I would say is another really important thing. And again, doing that from the position they're in, it can't be something that's imposed upon them, it's gotta be something they've chosen to do because they had the need, and if it's all about the just in time stuff, I need to know this moment's really, and giving a choice to the practitioner in the sort of ways that they could take something on board. The other thing we know, of course, is it has to be based around why is this gonna be useful, what are the benefits and student outcomes because that's actually what motivates teachers. If I know this is gonna be good for my children, then yes, I'll put myself through the process of learning to make sure I can do this properly. They are kind of the key that can be isolated quite quickly, that you can then transpose into practice.

If people understand the research and then can take that research and apply it to practice because often educators feel as though they're working from inside, if you can match that with the research, then you've got a good basis for getting things right.

So some of the people who worked in [inaudible] here in the ministry – a woman called Carroll Moffett, who set up some of the distant learning opportunities in a little rural school in Canterbury, she came into the ministry quite passionate about this area because she had seen what a difference it could make in this school, and a number of the other people too.

So people like that who have gone before actually who came into the ministry and started showing how valuable this work was, and those of us in the seat picked up on that, but I guess that there's always been a small learning unit in the ministry for us as long as I can remember, or since Carroll came into the ministry, but now, the ministry is gearing up for a much, much bigger things – and I guess that has come with the implementation. So now there's a system wide need to step the model up so that all schools get the benefit ideas of what could come, so that's fantastic, if that's what's created the opportunity, it's really fantastic. Hopefully we'll see some amazing things come out of it and come through.

Interviewee #17 said,

this implementation "comes very much from a learner driven perspective. It's not about the e-learning, it's about our curriculum and how best to support the needs of our learners. And from that is the need for e-learning. So I would say we come from a very learner driven perspective.

I guess one of the key things that I found useful was that the ministry put up some – they're on the website, some actual guidelines as to what a school

> might have in terms of infrastructure, a ratio computers to students, cable requirements, all those sort of things.

Interviewee #2 added that,

> the development work has been done in schools, and the research has been down outside schools. The challenge is to bring them together, curriculum and assessment, in the revised curriculum, which try to link eLearning to the goals of the curriculum is the notion of teaching as inquiry.

Finally, Interviewee #19 shared how this

> is very much a grassroots movement. That definitely hasn't been a top down in this stuff. It's been driven by schools themselves deciding this is a way that they can maintain and enrich the curriculum technically in the senior secondary part of the school.

Research question 3. Research Question 3 asked: What is working well and what are any unexpected benefits from the way New Zealand has implemented the online learning environment in secondary schools? Several key benefits including: ICTPD, the VLN, TELA Program, providing educational opportunities to all students, professional collaboration, and a pedagogical shift were identified by the interviewees.

Access to new educational opportunities. Providing students access to new educational opportunities was the biggest benefit of implementing online learning in New Zealand's secondary schools with 74% of the interviewees discussing it. Examples of how e-learning has provided new access are shared below.

Interviewee #1 shared how "for a kid now in a rural area or any school can now pick from 300 courses. They can basically do whatever they want and stay where they want. That works for the staff as well because in some schools enrollment has been

falling and they are gonna lose their jobs next month and they've got 15 kids that they are teaching, and they want to stay where they are, so it's a kind of win, win situation."

Interviewee #2 stated that, "I think parents will find themselves more engaged with their students learning over time. It is happening already. It's opening up the classroom to another whole notion of 24/7 engagements so I can think about my child's learning at home at 11:00 p.m. or 10:00 p.m., or whatever."

Interviewee #4 discussed the VLN and Correspondence School. The traditional schools were just not serving those communities in a convincing way.

> They were losing students to larger schools in urban areas and having difficulty keeping school communities alive and vibrant and attractive to staff and offering opportunities. And so then, out of that need came, initially from the correspondence school, that drive to provide a better service, a more engaging service to schools. And what happened, then, was that people then took more ownership of that, and the correspondence school faded for a range of reasons in terms of that, partly because it not necessarily as appropriate 21st century education." These new ideas often come from the schools and "initially, start off often in ICTPD, seeing opportunities, et cetera, and then, developing and evolving and moving on with the same sort of concepts have then created more opportunities for the students. So they're able to get a wider range of subjects. It's more engaging. It's local, context. And so you end up with actually an interesting kind of network, which is in a way, centrally mandated in that we've provided funding, or we provide the infrastructure.

Interviewee #7 focuses on the benefits of the VLN.

> That works really well because they actually have a need. The online services solve the geographic issue for them. I think that the VLN actually has more potential long term because I think the VLN shows how you can actually engage with students and students can engage with you in a different way, using some different approaches, and fundamentally change the way you do things. Projects like the VLN, allow children to participate in classes or stay in their community and stay in their school, where otherwise, they would have had to move.

Socialization with students from around New Zealand is another benefit that Interviewee #8 describes:

> I think the online schools that we've had spring up have enabled remote communities to actually keep in touch with the rest of the country and the outside world through using telecommunications, and we've had some interesting things happen. For example, at one stage, one of the schools on the OtagoNet videoconferencing cluster, a teacher went past the VC room and there was this kafuffle coming from inside, and there were a whole lot of girls in there. Now, it just so happened that this rural school, in their last year, they had something like eight kids, and five of them were girls. So there was a formal coming up, a dance, and so what they had done is they had lined up these other kids at this other rural school, and they were organizing blind dates over the VC. I mean, that sort of socialization, and using communication tools to break down distances, I don't think people realized what the effect of that would be. I think that was actually quite unexpected. People thought that it would just be some sort of a work tool, when, in fact, it actually has a range of stuff.

Interviewee #9 focused on the new opportunities for the special education population:

> Particularly for students with special education needs, again, in my experience, I've seen the individuals growing in confidence because sometimes they've had greater access than their peers to the technologies and then they become the cool kid rather than being the dummy. I've seen some really quite significant shifts in students' own sense of their worth and around their identities as a result of using online learning. The fact that people can view students with special education needs who have access to technologies as being so capable and real contributors to society. That's probably – from where we sit – one of the most important and slightly – perhaps not unexpected, but certainly something that has often exceeded our expectations. That's absolutely fabulous. Oftentimes it's gone on to open up career pathways for individual students, which is fabulous for them and fabulous for society.

And finally, Interviewee #13 shared a story from a recent study, which clearly summarizes the unexpected benefits of e-learning in New Zealand's secondary schools:

A researcher from Victoria University at the time, came down as a researcher. He went through and interviewed a number of parents – did a bit of sociogram of the Oxford Area

and looked at things like the number of people and all of that sort of thing. To create a snapshot, really – at the beginning, and then he came back two years later and did a follow-up.

And it was really interesting because at the time that we set it up, the Oxford Area School, which is really a pivotal path of North Canterbury in terms of farming area was reviewed. It's a farming hub where people come and go for all their farming needs and things. But it's only an hour out of Christchurch, and so is considered a suburb of a city. That school – the enrollment – it was falling. It was very close to 300 students.

The researcher found that the impact on the community was quite severe. There were shops closing. There was rise in the amount of marriage counseling going on through some families. There was stress on farms because farmers having to pay to send their students – send their kids away to boarding school was costing money that in otherwise, they would have been paying to bring a family in to employ on the farm.

Both the culture and the economy would be impacted that way. And of course, for many farmers, they relied on having their sons around to help on the farm afterschool. And being away at boarding school, they were no longer there. He built quite a sociogram, to show a sociological picture of that community.

There was significant improvement as result of being able to keep away students in the local community and keep them engaged and giving them access to the courses they want. In only two years, the enrollment at that school had climbed to 500. All of the indicators that he had used in terms of the health of the community showed significant improvement.

The second thing that made it really important for me was that one of those students was a young Maori girl who had gained all straight As on her science courses, and who desired to become a doctor, but because of her family circumstances and poverty in the area and poverty of her parents, there was no way they could send her away to boarding school to do her school. And of course, to be a doctor, she was going to have to study science subjects in the last two years of school, and there was no science teacher at this school at the time.

Because we were able to set the thing up, we were able to provide her science courses. She completed the course. She completed her schooling. She went on, and she is now nearly finished training to be a doctor. And that's quite an outstanding achievement if you know and understand the social kind of conflicts where they came from."

Finally, Interviewee #18 summarized the benefit of providing new opportunities with "students are staying at school for longer, because of flexibility. Kids can take 2 or 3 subjects and work from home as well." These are new personalized environments catering to students' specific needs.

ICT pd program. Forty-seven percent of the interviewees believe that the ICTPD program offered several benefits and unexpected outcomes.

Interviewee #4 and several others said that:

> what has probably had the greatest impact would be I would say professional development has had a big impact in the fact that it's been longitudinal, not for the amount of time that it's run, but the fact that it's had a pretty dedicated amount of money to it, so it's, therefore, given a lot of people opportunity to see what the possibilities are. And things like national conferences, and giving teachers the opportunities to go to those sorts of things and raise horizons, et cetera, have been done so over long period of time.

Interviewee #2 adds "that I think that has been large scale. I think it's impacted pretty much all teachers in New Zealand from what I can tell from the last few months. I think it's had a huge impact."

Interviewee #5 shared that the programs that teach practice have the greatest impact.

> So the ICTPD program, which is where clusters of schools have to work together so they collaborate, they have to look beyond their own boundaries, and they have to decide on a project that's relevant to them. So that self-determination has been really important. And again, it's based on the basic principles of teacher development, that if you let teachers decide what it is they need, they're usually pretty good at diagnosing. And having that ability for self-determination has been fantastic. So again, it's the old story, if you say to people you have to do this, you get resistance. If you give people the power and say, well, you decide on a project that's gonna suit your needs, they'll rise to the occasion.

To add to this, Interviewee #7 talked about how you can

> give them all these cool widgets and gadgets. Teach them how to use all these things, and then put them back in the classroom where we haven't actually solved any of their problems, and so none of the things work. Whereas actually focusing on an ICT type PD program that is very much seated, takes as its core not teacher PD, but teacher student engagement and learning. And supporting teachers in the

> real world situation, I think would be real cool. I think the ICTPD, to date, has probably had the biggest impact.

Interviewee #8 summarized it well, that "it doesn't matter, you can put all the gadgets and widgets, and bells and whistles, and wires and cables, but if you don't actually change the hearts and minds of the people, at the end of it, all of it is just a wasted investment. So that's where we need to put more support is into the teaching and learning area."

Policy, funding, and leadership. Nine of the nineteen interviewees or 47% identified benefits of the policy, funding, and leadership processes of implementing e-learning.

Four interviewees discussed the importance of leadership in enhancing the benefits of e-learning. Interviewee #3 mentioned that something "sorta boosted stuff in the last 12 months is we had a change in government." Interviewee #9 stated,

> I don't think one can underestimate the difference that individuals can make when all the other stars are aligned. The other thing that is not on the list – but I suppose it's under leadership – it's that sort of championship. We've been lucky enough to have some wonderful champions with huge credibility in the sectors – people like – that are just rightly legends in their own time.

Interviewee #10

> thinks a key thing now and from what I'm hearing in some more recent appearances is that some of the senior leadership are realizing the value that could be in E-Learning. So they're beginning to put some resources towards it starting with investing in people like me hopefully. Desire2Learn as well, so I think it's almost a recognition that, yes, this is something that we need to be – we need to get into and we need to do it really well, so – but we're probably not at the point yet.

Several interviewees shared how an investment in the technology infrastructure and PD have been a benefit of the process. Interviewee #2 shared that "funding has made the greatest impact from our perspective. The Ministry as a place sees that its key role is to fund wisely. Its other key role is to provide leadership, so the uptake of those funds is productive. Funding is actually increasing, but it is being focused around the Broadband Initiative."

Interviewee #3 said that:

> one of the things the new government wanted to do, because it also coincided with the GFC, the Global Financial Crisis, was, okay, we can make some investments in infrastructure. That'll give people jobs, and plus it's a good springboard for the future. When any government gets up and says, we're going to spend $2 billion on broadband, even people who are – well, I mean, people are still saying, that's interesting, that's a lot of money, especially when the government said, and we see education as one our anchor tenants. One of the whole reasons we're doing this is because where we see education in the future. So that money didn't come out of the education department. It came out of the Ministry of Economic Development. The Ministry of Economic Development are driving this broadband agenda, so that's now filtering down to some of the old troops. I think now that that's changed, and that's changed because people are now seeing the whole broadband online world as not a flash in the pan, but as a springboard for a modern 21st Century economy.

Policy is also key. Interviewee #2 shared, "if we can produce policy that protects from impatience and political manipulation, those nascent features of change are worthy of protecting. So I guess for me, policy is about setting up an environment in which all the subsequent decisions can be made, PD Infrastructure."

Interviewee #9 shared another policy benefit of

> when I first worked in this arena, schools were easy prey to the various vendors and spent a disproportionate amount of time trying on an individual school level to sort out whether it was better to go with Mac or PC and getting themselves into

> real pickles, quite honestly, because there were some pretty unscrupulous vendors around in those days. So, I think having a scheme to which schools could turn to know those decisions have been carefully researched and made available. I think certainly the strategy documents have been helpful to us in the Ministry. I'm not sure how helpful they are to schools! But they are certainly helpful to do more joined-up thinking about the Ministry.

To summarize, Interviewee #4 stated, "Patterns of ICT capability development are predictable and measurable, but quite contextual in how applicable they are. So as a basic concept, we're saying that we understand what these factors are." And we can say, "Now, in a good school, leadership would look like this, and you're policy would look like this, and your strategy would cover these things." And Interviewee #2 added, "wise funding is crucial, and leadership, policy do its maximum good, rather than its minimum good."

Curriculum and pedagogical change. A shift in the teachers' pedagogy has been an important unexpected benefit of implementing e-learning with 47% of the interviewees sharing their perspectives. Recent changes in the curriculum have produced many opportunities to expand opportunities for students through ICT.

Interviewee #2 discusses literacy,

> in the past, literacy was seen as something that was delivered between two cardboard covers. Now it is seen as something that is delivered in a range of modes, and so there will be increasing walking towards each other from curriculum specialists, who understand literacy in both its conventional and emerging multi-literacy sense, and those of us that understand digital technologies in dear relation to multi-lit. I think multi-lit will become the common ground over time.

Other approaches to learning were shared by Interviewee #4. "doing inquiry-based learning and using online tools to do that with, whereas, at the secondary, it's more – in the online sense – around, the VC for rural areas was the starting point for online.

And then, it tends to be focused more around learning management systems, so modal implementations, and kind of more controlled systems, as opposed to a slightly more free-fall use of the tools which are out there like wikis and blogs, et cetera. In primary more is around where they've used in underserved communities podcasting and video, vodcasting and stuff to reengage kids with literacy and numeracy and just make learning a hell of a lot more relevant than it was before."

Interviewee #5 expands on this by saying,

> I think the whole notion of student voice, and that change of learning culture that comes from students coming to the table as an equal. When they actually are more familiar with their environments and their teachers, then there has to be a trust, and I think that's been quite an unexpected change. So what we know about mentoring is that the mentor benefits is as much as the mentee, and that's certainly been true, and the practical examples I've seen – I think the benefits are still unfolding.

Social Networking and the student are the focus of Interviewee #7's response.

> And you also have the kids that use the computer I know they do this. I see my own kids. We've got a reasonably good connectivity at home. My kids come in there now. Their learning has changed over time. The last five years, it's not just as they matured, but there, it used to crack me up a few years ago when they'd come home and be given an assignment by the teacher and the teacher really realized how well connected most of the kids were in the class. They'd come home and straight onto MSN or straight on to Facebook or whatever. How are we going to do this? They'd collaborate and they'd solve the problem together.
>
> And they're in there and they're working together. They're actually just working with each other. They put together a collective answer, collective solution and take it. That's really cool, really cool. I had discovered them doing it one night. I've got the web cam going. And they have the web cam working properly. Who is that? We're actually just doing our English assignment, something on Shakespeare or whatever it was and great, cool, and then they'd work it out themselves.

Interviewee #14 has also noticed a change in his students. "Rather than just thinking,

> Oh, I hope the teacher stays at school," you minimize interaction. I've got kids who are now sending me invitations on Facebook. They want me to join their groups, or just to chat, asking questions. They're quite open about contacting, and having chats with their teachers, online, at any time of the day. So, that this whole sorta social barrier is getting a bit blurred, because we're not in traditional classroom. So, confrontation style – there's still some classrooms is going away. Interviewee #13 shared that
>
> one is the impact that I see from teachers who really take this seriously. We are impacted significantly on their whole view of pedagogy, whether it's online or face-to-face. And we can celebrate a number of teachers in the country now who have wanted to be transformed through this process and through that are working to transform their schools and the education systems. So I think that impact has been really good.

And Interviewee #18 added that teachers are taking the new curriculum and changing the way they work. The structures and roles of teachers and leaders is changing and we need some brave leadership to follow through."

Created a need, not forced/mindset change (grassroots). Seven of the Nineteen interviewees, or 37%, said that the grassroots approach to implementing e-learning in New Zealand's secondary schools was an unexpected benefit to creating a need and changing the student, teacher, parent, administration, and community mindset of how to educate students because it was not forced on them.

Several interviewees shared how this benefit has affected them such as Interviewee #1 sharing "so the models that we built up, we can actually implement where people need it rather than try to force it on them." Interviewee #2 stated, "I did it because I have to, now I do it because I love it. That's an unintended consequence or an unanticipated – maybe that's worth teaching out someday by some other study."

Interviewee #2 also stated that the MOE "is in dialogue now via the digital communities, as opposed to just putting rhetoric into teachers' ears, and I think that's the unintended benefit. We're actually potentially a lot closer to the wisdom of the sector, and then potentially, a lot closer to the wisdom of the Ministry."

Interviewee #3 said that, "as the technologies become more pervasive and cheaper, more and more kids are turning up with them, and they're demanding that their online life connects more closely to what's happening at school."

Technical obstacles and the age of teachers was also an unexpected benefit per Interviewee #8:

> They didn't realize that with the videoconferencing unit – I used to say to teachers, If you are able to use a remote control on a television set, then you can run a video conferencing unit and use that effectively. So I think that that was possibly an unexpected outcome. I think the other thing is that we also felt that a lot of older teachers would be quite hesitant to use this sort of stuff, but, in fact, that wasn't the case at all. I think we undervalue sometimes how inquiry the minds of people are in education, and how they're interested in finding any sorts of new methodologies or approaches that can benefit youngsters.

To continue, Interviewee #8 shared a specific story about a teacher he had worked with.

> We had 28 teacher in rural Otago, and they were all ages. I had one lady teaching classics, and that was her last teaching. She was going to retire. She was passionate about her subject, but the school was so small that she couldn't actually teach it, so she was teaching something else. So when we did a survey and found out that there were about 15 kids across the whole of the region who wanted to do that class, I sent an email out and said, "Is there anybody who has a classics teacher?" This school came in and said, "We've got one." I said, "Would you be prepared to put it forward?" The principal said, "Oh, yeah, she's just fantastic, but we've only two kids who want to do it down here, so we just kinda put them on correspondence and she's going to teach something else."
>
> So we were able to make a class up for her, and she just took to it. I mean, she was very hesitant and very nervous in the first year, but after she'd been

> through it all – and the kids were wonderful. They helped her, of course, and it was really a very, very fantastic outcome for her. So I think that was unexpected, because you always think these sorts of things, dare I say, are going to dominated by the young, and that's not the case at all. I've always felt, in some respects, that the idea that's been propagated about the natives/immigrants sorta stuff. It's got a lot of holes in it, because we have people of all ages that adopt and adapt and evolve technology. It was one of the guys from Google, I think, and the statement was made was that young people pick up this sort of stuff as users and so on. They use it all the time, but it's been built by all these guys with gray hair. So I think generalizing about who's doing what and so on, and I've got an elderly relative who's been involved in Senior Need, which was a movement over here to get the retired community involved in ICT.
>
> He would use the range of technologies, probably even more extensively than most young people would, so I think you've got to be careful about generalizing that sort of stuff. It's a lovely sorta tag line, but it might not be correct in reality.

Professional collaboration. A benefit of the ICTPD and as a result of the grassroots movement, seven of the nineteen interviewees or 37% have found an increase in professional collaboration, benefiting the education system of New Zealand.

Interviewee #1 said,

> I'd say the biggest impact is the actual, I think, the collaboration and the breaking down the distance between the schools. We see that they're actually starting to collaborate a little bit more. And that's mainly in the rural areas that the urban areas are – there are certain schools that want to do that, but are finding it difficult. So you start to build relationships in education, so what are we doing and how do we interact. And you've got maybe two schools here – two over here, so they kinda form their own cluster. So that kind of imagery is quite good for actually explaining it doesn't matter as long as you kind of have set guidelines of the few, and to give some you have to receive some. There's no money interaction, it's about you offer to teach, we offer to teach. And that is working, and I think it's always going to work.

New Web 2.0 tools are also allowing for more collaboration as Interviewee #2 stated,

the communities of practice are going to work more effectively because the axis to thought, which used to be who got invited to a meeting, and now it's who read your Twitter feed, who reads your blog, who's in your community? It'll bring challenges, but they're worth – I mean, I think they're unavoidable, so yeah, hey, unintended consequence.

They are also breaking the historical mold of how the Ministry talks to the sector and how pedagogy gets thought about within the Ministry. The Ministry is now increasingly forced to talk among itself, around, well, I know about literacy, you know about e-Learning, let's start listening to each other, so we're forced to think again collectively in new groupings about our beliefs about teaching and learning, and that's a very good thing," shared Interviewee #2.

Interviewee #4 stated,

But it's essentially about community. So if the ministry or anyone else did something to really, really annoy those people, they pretty much have enough critical mass to self-organize, pretty much. So that is perhaps one of the most compelling and interesting stories to be able to tap into. So in terms of an approach, the expert external facilitation through face to face delivery is important, but so are online communities of practice.

Finally, as interviewee #19 shared:

a lot of the teachers are specialist curriculum teachers, and they may be the only teacher in their curriculum area. So the other real benefit has been that networking of teachers across the region and beyond, which we're talking more than online teachers. We're talking about teachers generally. This is face-to-face. We haven't taken it as far as we want to, and I've got another project, which is aimed at building that collaboration under the Otago net sort of umbrella. The other real benefit we had from the whole virtual e-learning network is that we do arrange for guest spots.

So we have had people like the Prime Minister and students in small rural schools have been able to talk to our Prime Minister face-to-face for an hour or so, and we've paid authors and top sportsmen and scientists and so on. So there has been that list of formal thing happening, and the VC component of things which have enabled us to reach out and link people who you wouldn't normally have the opportunity to talk to and places where you wouldn't normally have the opportunity to really have some quite rich and deep conversations.

Research. Research was identified as a positive outcome of e-learning by six of the 19 or 32% of the Interviewees.

Interviewee #1 shared that "over those years some of the research that we've gotten back is that we are getting slightly above national average pass rates with kids on VC one hour a week, which is quite cool." Interviewee #7 said:

> we do know, in terms of all of these things, that in terms of teaching and learning in the context of the VLN, the research project and see, a project where we compared the achievement of senior secondary students participating in the VLN with senior secondary students who weren't to look at all the differences, in terms of formal and informal results. We've got the research, basically what came out of that was the kids who were in the VLN did just as well as kid who were in the classroom situation. They didn't do better. They didn't do worse. They did just as well. Which at first, went oh damn, we wanted them to be better. And then when you think about it, no, actually it makes perfect sense. They were more engaged than they would have been. They were given opportunities they wouldn't have had otherwise. But in overall, there was no negative impact, in terms of learning.
>
> In fact, for some kids, they preferred to learn in the virtual environment. Some kids didn't like it quite as much. So there was a range of views within there that kind of mirrored the range of views in a classroom as kids who like personalize learning as opposed to structured classroom learning. Actually a good result because what that's saying is it's not impacting negatively, in fact, and it's doing some other things that wouldn't otherwise be happening.

Interviewee #8 added, "so the whole thing has just sorta mushroomed and snowballed as the school communities realized that the results and the outcomes for the youngsters were just as good as and if not better than the paper-based correspondence that they'd had previously."

Other benefits. Other benefits and unexpected outcomes were shared by the interviewees such as: the TELA Program, 26%, the Virtual Learning Network 21%, and

Infrastructure 21%. These three programs were identified by interviewees as providing the benefits and unexpected outcomes above.

The TELA program has transformed teachers. Interviewee #3 shared:

> we go around the schools and say, "What makes the biggest difference in terms of e-learning for you?" They all say, "TELA laptop." So Otago University and Waikato University, they've been running these ongoing longitudinal research things for the laptop people.
>
> I think they've been following the first 8,000 teachers. A lot of the universities put a research program around that, and what they found with all these different groups of teachers is it always takes about the same time between getting the laptop and then feeling confident to use it in the classroom. What they found was it was, for nearly all of them, it was about 18 months, so it was kinda halfway through the lease period.
>
> When they interviewed the teachers and said, "How come you didn't use the laptop sooner in a confident way in the classroom?" they said, "Because I didn't want to look like an idiot in front of the kids.
>
> You wouldn't see many laptops in the beginning and now, when you go there in 2010, there's a lot more confidence. They're using them now, you know. If we were to threaten to take the laptops away, like when there was the global meltdown last year, the new government here suggested we cut the laptop program to save $20 million a year, well, that went down like a lead balloon. Now it's so firmly ingrained that it would be impossible to take them away.
>
> So the pressure we're under there really is to not pay 66 percent but to pay 100 percent, because lots of teachers say, I mean, like you or I, I imagine when you go to work, you don't buy your own laptop. Everybody takes it as a right that they're going to be provided with a computer. Most teachers now, there's been that real transition from, "I used to use my laptop maybe to check my email, just to type up my lesson plan," but increasingly, with so many resources now being online they are using them for everything now.

The Virtual Learning Network has also made a positive impact on New Zealand's education system by providing access to a high quality education for more students. Interviewee #12 said,

> the Virtual Learning Network, some people said it's made an impact, but they see it as in the future making a bigger one, like it's still kind of a quiet, hidden program that only a few people are using or are aware of, but the ones that are

> doing it are getting a lot out of it, and so they see it growing with the broadband – with the national broadband plan. They see that is going to be a huge thing later on, but it's doing well right now.

Finally, the benefit of the Ministry's investment in infrastructure has and will continue to be a huge benefit of the implementation. Interviewee #2 stated, "Infrastructure, that will become more crucial, it appears to me, as the broadband and National Education Network initiatives are rolled out.

Interviewee #13 said,

> that this whole development has really been a key driver behind where we've got to in New Zealand in terms of the implementation of and improvement of our broadband network. But these networks and the passion and enthusiasm of the people who have been involved in setting it up, really have been a strong driver behind both the government and the private enterprise telecommunications communications, putting more time, effort and investment into developing a robust national network.
>
> We now have over 100 kilometers of fiber in the ground in the city. We've got 40 schools that are currently connected. We've got another 32 that are waiting to be connected. They've already signed up, and by the middle of next year, we'll have the whole 164 schools that are in the city that will have fiber at their gate, at least. And it will be up to them to make the decision about it being connectable. It looks like and the early indications are they will just do that.

Research question 4. Research Question 4 asked: What is not working well and were any policies abandoned during the implementation of online learning in secondary schools? Several barriers and obstacles including: infrastructure and tech support, professional development and a mindset change, and a lack of leadership, policy, funding, and research were identified by the interviewees.

Infrastructure and tech support. 79% or 15 of the 19 interviewees reported the technology infrastructure and a lack of technical support as one of the biggest obstacles to implementing e-learning in New Zealand's secondary schools.

Six Interviewees noted the fact that "a lot of the families across the two islands do not have Internet access or computers at home, but are unsure as the Ministry has not delved into that area" (Interviewee #1). "We don't have any kind of stock-take of hardware, of teacher capacity, of student behavior in relation to digital learning, so the key point I'd make in response to this question is we don't know what is going on," said Interviewee #2. Interviewee #11 said because of this, "you end up delivering mostly to white middle class kids whose parents can afford to buy the equipment and that sort of stuff." "Those students where ICT can make the greatest difference (isolated, low-income) are least likely to have access," said Interviewee #16.

Not only is there a lack of access to the Internet and computers in the homes, but the unevenness in access is also prevalent in schools as 11 of the Interviewees shared. First, Interviewee #3 described:

> In New Zealand, if ever you want to design a country for broadband, New Zealand's the worst possible example, because we are – if you look a – so here's North America and South America, and Europe, and Africa, and Asia, and Australia, and New Zealand. If you look at Internet flows, they're incredibly big, like this. Nearly all of the Internet is going this way or that way. There's only one little wire that comes down to New Zealand. So we, firstly, we have a thin piece of spaghetti connection to the Internet. Then, of course, New Zealand, there's two islands that are very thin and quite mountainous, so putting fiber or any connectivity around New Zealand is actually quite difficult, physically. Even when it gets around New Zealand, then it's on this thin pipe back to here. So because there's only one wire, then they keep the price pretty high, whereas

> across the Atlantic, for example, there is a whole lot of Internet providers and a whole lot of cable, so you can really drive the price down."
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> Interviewee #8 added,
>
> connectivity in New Zealand is still poor by world standards. The government is investing in that to change that, but as I said, that's going to be a five-year process, and I think we probably need those changes sort of now. Mind you, our neighbors, the Australians are in a similar situation. They are investing in national infrastructure at the same time that we are doing it sorta, and it's the same in other jurisdictions around the world as far, as investing.
>
> So it's investment, actually having the ability to connect, and then making it affordable so that people can participate at a reasonable level. Our telecom's charges and costs in New Zealand are pretty high in comparison to the rest of the world. Now, I'm talking about Internet connectivity and cell phone charges, sending a text message, all that sort of stuff. Whenever I go to the States, the plans I see that they have over there are pretty cheap data plans without calling, and that sort of thing.
>
> So that's a barrier, and part of that is the result of basically having a telecoms monopoly, because telecoms in New Zealand was owned by the state, and then it was sold off, and the outcome of that was that it just became a large company that really hasn't had too much competition. When you're a virtual monopoly or a monopoly, because of historical reasons, you tend to be slow to change and you want to protect your position to your shareholders. That's normal commercial behavior, but when you're actually trying to leverage something out of that, which has such a substantial effect on all your citizens, then that makes it difficult. You'll either be able to have the state in control and seeding the process and everything for the good of everybody, or else they have somewhere where there's a reasonable number of similar-sized competitors, and they're competing with each other in an active market, so that you've got choice and you can actually affect the market by putting out tenders and having that competitive response and that sort of thing. New Zealand's a bit too small for that, only 4.2 million people.

Although New Zealand's remoteness, which has caused a slow implementation of Broadband Internet access, there is still a digital divide among access at the school level, as reported by 11 of the interviewees. Interviewee #3 from the MOE talked about, "where we haven't done so well is in some of the providing the hardware, because that's sort of a

school responsibility. Generally speaking, we don't buy computers for schools."

Interviewee #12 added,

> it's up to the schools to pick up their own hardware and software, and it sounds like some things have been reviewed but there's not really a process where, I think in the past it was each school kind of picked their own and some made really bad decisions on what technology, but it's kind of getting better, like the ministry is recommending, here's three different learning management systems or kind of helping them out and providing guidelines in that way.

This divide was also noted by Interviewee #3 in that, "a lot of people who were in the PD program said,

> Well, I have done the PD, I've got the ideas in my mind or I've got five ideas that I want to try out this year, but I don't have Internet connection in my classroom. I don't have a device that I can use. I've got to take my kids off to the computer suite, and then three other teachers are already booked up ahead of you, so that holds sorta access to hardware. It has turned out to be quite a big issue.

If things do not change, Interviewee #2 said, "the schools without infrastructure will be relatively disadvantaged and that will need management."

Interviewee #5 also noted that, "a lot of the things, structural things, for example, a lot schools haven't been built with IT in mind, so you've gotta create the spaces in the ways of providing access." Interviewee #11 added,

> and some schools still have things like computer suites where – that they're timetabled and you can only go into those – can only use the computer when you've got timetable access to it, and for our students they usually aren't timetabled because they don't – they're not seen as high priority, so that's quite difficult. We've started negotiating with some of the providers we've got.

And as Interviewee #12 described, "some schools have access to the hardware and some don't, and so it's hard to implement everything everywhere because without the equal access."

Interviewee #15 - But for them access is okay, but they are not used to learning in that way, so there's quite a lot of education around that and being also for our young adults, which the roll has really grown a lot they have problems with access. So access in being able to learn online is really our two biggest issues, and I'm pretty sure that's for a lot of people, but in New Zealand we're now [inaudible] remote which means that they are usually quite remote, and broadband is a problem here in New Zealand.

When there is access to technology in a school, the obstacle of finding quality technical support becomes an issue. As Interviewee #4 noted, "one of the things which comes up most frequently for the teachers in the program is access to the technology and timeliness and reliability because they see themselves, quite rightly, as not technicians or people who should be repairing stuff. They want technology, which is very reliable and accessible, and they will avoid it if they don't get hold of it."

Interviewee #6 shared,

> but no money is provided for technical support through this game, or as far as I'm aware, And that also depends of course on the size of the school. I mean, sort of the school where you have five teachers, they're not gonna be able to afford a tech, but they might bring in someone from outside maybe, you know, Charles's father or something that can – like your big schools will have a dedicated IT technician to run the tech support.

As far as infrastructure is concerned, the Interviewees are concerned of the "danger is, the broadband group that we'll get trapped into. Let's focus on the wires and the cables and the technology and all that sort of stuff and lose sight of the fact. But that group, I think they kind of understand that notion that you have to keep everything in balance going forward on that," shared Interviewee #7. Interviewee #9 added,

> there has been the tension between the techies and the pedagogy. Particularly in some secondary schools, I've encountered network managers whose power base is maintained by deliberately fostering the impression that nobody else could possibly understand the technology! Fortunately, that's absolutely not the norm. But there are still some network managers in large secondary schools who are laws unto themselves.

Finally, three of the interviewees talked about the obstacle of being early adopters in New Zealand. Interviewee #9 shared,

> I guess another barrier, although I'm not quite sure where it fits here, but it's that New Zealand is often characterized as being a country of early adopters. I think also a little bit of a test-bed for new technologies sort of on a smaller scale. That's fabulous, but the downside of that is that if you're an early adopter of today's technology, you're also going to be an early adopter of tomorrow's technology. We're slightly fickle. We don't tend to stick with things. We're almost too nimble. So, we'll adopt something and then in two or three years' time, when we should still be reaping some of the benefits of a systematic investment, we're actually on to something else.

This was also seen by Interviewee #8 who was sharing about the VLN and how, "I think down the track what we'd like to see is the videoconferencing has been quite a dominant feature, but some of the clusters are now using Adobe Connect or Elluminate, something like that, so they're using a web enabled tool instead of videoconferencing, or to supplement and support video conferencing." All of the investment has been in the video conferencing units, and the schools are quickly finding these new technologies.

Professional development and mindset change. Although professional development and a change in mindset were seen as a benefit of implementing e-learning in New Zealand's secondary schools, 15 of 19 or 79% of interviewees also noted it as a barrier or obstacle. As Interviewee #1 noted, "people are still trying to figure out how you do the teaching."

Although the ICTPD program has been successful, other areas of PD have been lacking. For example, the TELA program originally had a 40 hour professional development requirement attached to receiving a laptop because as Interviewee #6 said, "when we provided it to them, many had no clue what to do, and some teachers were using it as a paperweight, and that kind of stuff." However, this idea of professional development was abandoned as Interviewee #3 noted, "so because we have quite a devolved education system, we said, "Well, we have no way of checking, so it's an unnecessary compliance cost on both the Ministry of Education and on the schools." So we, after the first three years, we took that away, we took that out of the contract and we just said, "It's expected that as part of your normal teacher professional development, you will do suitable development." But we are now finding, "even for our teachers or for American teachers to go from being the stand away of teaching that we were all taught how to teach, to go to an online facilitated process, that's a challenge. If you're in Singapore, or Taiwan, or Korea, that's a double challenge or a triple challenge," and this has not yet been a focus in New Zealand. #13 - Were there – besides the isolated training them not enough on the pedagogy and instructional design. Interviewee #13 also shared that, "the instructional design – pedagogy – that sort of thing is definitely a barrier.

Although the ICTPD program has been very successful, there are still things that can be improved. Interviewee #4 noted that "there are some quite large gaps." There is nothing offered after the initial three years.

> It is always gonna be you're not going to be able to do enough professional development. This program [ICTPD] has just operated on its own as an entity,

> which is drawn like a laser beam around the country. Understanding how you go through the three years and how do you sustain the change? This work is reasonably immature and I am probably going to go on to suggest that would be the same certainly across programs within the Ministry but also would reflect internationally, probably, the approach. So, for example, we have this approach – and I think there is more we could do around what happens before, during and after and what happens to the other schools with their own programs. So, for example, we've got about 10 to 14 percent of schools in the program at any one time with a turnover of around 5 percent. Then the question is, what are we doing for all of the schools all of the time?

A couple of the interviewees discussed the barriers "have been around perception – teachers' perceptions – of their own competence with use of e-technologies. Over and over again, I've encountered teachers who say, "I don't need to understand because so-and-so," – one of the students – "makes it work for me," which is an abdication of responsibility," as Interviewee #9 described. Interviewee #10 said,

> establish a stable situation that's used to, you know, as with many institutions and businesses all over the world, it's a change in mindset and that's – for a lot of people, that's quite a major change, and a lot of people, for whatever reason, probably because they don't really understand it, you know, instantly, are resistant to it. So part of my role is to at least make it a lot more accessible and make it easier for a lot of the teachers and the people to understand exactly what we're trying to do and what we're trying to do.

Interviewee #9 also noted,

> contrary to perhaps the popular view, in my experience the willingness to give it a go and the self-confidence doesn't line up with younger teachers. Many people say, 'Well, teachers who are just coming out of the initial teacher education who have used technology themselves in their high school years – I'm sure they're more comfortable with it.' Actually, my experience has been that some of the more mature – in terms of age and teaching experience – teachers are the most creative and adopt the e-learning technologies most readily. They're secure in their pedagogy and they can very readily extend to incorporate e-technologies in their pedagogy.

There are even barriers to changing parent's mindset. Interviewee #11 shared a story of visiting a family of one of his students:

> but getting to visit a family once, and the boy was obviously someone that loved being on a computer, and he only got to do it as a treat. You know what I mean? So he had to do his boring school work on paper, and as a treat, he was allowed to use the computer. And so I was trying to say to the mother, you know, what about him coming onto the online learning program? Because we have got a whole program where kids are doing the entire program online. And she said, oh, no, no, no, no, I don't want him to do that because he spends far too much time on that computer anyway.
>
> So their mind is always what it was like when they were in school and why shouldn't kids have to suffer the same as what they suffered? So that sort of covers also, I think, about the student services, like what can we justifiably provide for students? Some of the impediments that, you know, even if we could afford to give every single student a laptop, the public perception of that could be quite negative. I know that some institutions that have provided that for their students end up in the front page of the paper and say, what a waste of taxpayer's money and, you know, because it's always that perception as well.

Another barrier was expressed by several of the interviewees, was that of the teacher mindset. Interviewee #5 said, "some of it's about development for change, and about people's fear of change. So some of – with practitioners who suddenly realize that kids know a lot more than they do, my authorities under mind. How can I face five classes of kids a day if I don't know – if I'm not in total control of what I'm doing. So that's a huge barrier to overcome in practice." Interviewee #12 noted, "so less barriers to give identifiers. We seem to have skipped over the fact that a lot of teachers actually just don't want to do this. I think of the teacher willingness or unwillingness is really the barrier. I think that the mark of some schools that don't have proper technology and training in schools?"

Interviewee #14 shared:

> It's all communication and information, and what's education about? We're communicators. A teacher is a facilitator, taking our knowledge, and using it to communicate with the kids, and facilitate their gaining of knowledge. It's communication, and yet we – the traditional model has been for teachers to impose upon students what has been judged to be the appropriate techniques, but it's just totally ignoring the communication devices that the kids use and choose themselves. Facebook – all the kids have got Facebook. None of them actually want to use KnowledgeNet or Moodle. If I'm looking Stats class, the Moodle site, as provided free by the Ministry as a trial, and the kids are given their free access, but they've never bothered checking it. I've got kids on the class list; they have never even bothered accessing it. This is what is provided, and given to the kids to use, but it is not what the students have chosen to use themselves, and that's the big difference. What I'm doing is developing ways that the kids can learn where we use the technology that the students have chosen to use. They've chosen to use phones, mp3 players, Facebook, social networking sites. What I'm doing is choosing to use those same things that the kids have demonstrated that they want to use, and they like using. So, using that IT gear to do the job, to do the learning, to do the teaching, and that's a big thing. It's just a huge turnaround in approach.

Finally, Interviewee #18 noted the barrier of,

> teachers being reluctant to change. Teachers complaining that they have to teach to the test. Secondary complains where primary teachers are more creative. Secondary are a lot more traditional. So we're at a stage almost to the bit of a cusp where we had to actually get out there and sell the online e-learning is quite an integral part of this move towards personalizing of learning whether it be in rural areas or in the urban areas. So that's been an issue, said Interviewee #19, and that's only really starting to happen now, and that mind shift is perhaps the biggest challenge, and then schools restructuring themselves in a way that they actually can make the online options work really well. And that's sort of a big part of my job supporting the online learner in a school environment because often, you know, there has been a second, you know, schools have enrolled thinking we can't provide this, but here's the second best option. And then they tend to sort of go and forget about that student and overlook the need for ongoing local support of students.

Interviewee #5 noted, "you have to coach teachers to actually implement differently and show them how it can be done and how it can work. I think, ultimately, IT will lead to

some quite big systemic changes because the there are ways of learning that are no longer appropriate."

Leadership/Policy. Again, leadership and policy were a benefit, but can also be a barrier to implementing e-learning as noted by twelve or 63% of the Interviewees. As Interviewee #2 noted, "policies get abandoned due to political cycles, and there have been, to the best of my knowledge, managerial leadership over time has changed. The associations those Ministers made with key change-makers in the sector have changed as Ministers have changed. The emerging understandings of e-Learning are perhaps situated around policy communities of practice that change with Ministers. So I guess if things get abandoned, it's because key individuals change, and the leadership changes."

Having a common vision is essential as Interviewee #3 noted:

> leadership, I think it's probably fair to say that the rest of the Ministry of Education has not necessarily shared our vision of e-learning. They've seen us as a small team of people doing something that's a nice or interesting add-on. A lot of the leadership of the Ministry, like most government officials are older people who haven't necessarily seen what's happening in classrooms. They're not necessarily out there seeing what's happening.
>
> I think that's been one of the tensions that we've felt as the teachers. We want to do stuff, the kids want to do stuff, but there hasn't always been the engagement from the senior staff of the Ministry.

Interviewee #7 added that:

> the biggest obstacle I encounter on a day to day basis is the internal corporate structure of ministry. They get in the way. No, seriously, up until a few years ago there was a Secretary of Education who was very trusting, shall we say, and relatively laissez-faire in terms of process, and as a result, the government was embarrassed a couple of times. It was the previous government.
>
> The new government came in and the previous Secretary of Education had retired. And so Karen was appointed. And Karen had a very strong mandate to

> tighten things up. So there has been in the time I've been here, a quite significant change where a lot of people, kind of senior and experienced, who were generally very education focused and generally did the right thing, but didn't always do the right justifications or didn't have the right paperwork done, have kind of slowly left and have moved out. Whereas, I think, not – yeah, a different group of people have come on. I'm not being critical. There's much more attention to process now.

On another topic, Interviewee #3 said, "I think we used to be a long way ahead of other countries. I came here in 2002 and I think until 2006 we could say that. People would come here and say, "We're not doing anything like this." Now I think other countries have caught up and other countries have invested a lot more. I've been to Singapore a few times for various reasons. When you are in Singapore and see what they are doing, you say no, we're way behind the eight ball. They were just spending money on computers in 2000. Now they've really got the whole creativity thing going."

Interviewee #4 also shared this by saying:

> the current model we've got doesn't target the needs of the entire sector because it's for 10 to 15 percent of schools. The Ministry of Education needs to strengthen support and guidance to schools to help them identify and address their ICT capability requirements so that they can more clearly articulate them and plan for them and understand what they need to do and where to get support. And these are across three key areas that we've identified, the efficiency, effectiveness and transference. And transference relates to sustainability.
>
> So efficiency in terms of making a good choice in what they're buying. And effectiveness in terms of understanding why they're buying it and how it's going to be used and how they'll know if it's useful. And transference in terms of the professional development and curriculum and so on which is required to understand how to integrate. Schools require clear guidance about what resources and services will best meet their needs and freely available access to them.

Other systemic changes are needed as well, as described by Interviewee #7:

> I think there are some – will increasingly be systemic challenges that are getting in the way and the VLN exposes a lot of those, things like if you're doing

> something in the – if you're running, learning in the context of a distributed system like the VLN, using web conferencing, video conferencing, whatever learning management systems, whatever combination of tools you're using, in New Zealand at the moment, children are enrolled in one school.
>
> What does that mean that now this child is being taught somewhere else? And who has the accountability of the student? The child is being taught from another school in the country. And this school over here, the home school isn't actually teaching the student, but the student is enrolled there. And this student's achievement, who is accountable for the student's achievement, the school where they're learning or the school where they are enrolled?
>
> So there's a fundamental thinking that needs to go on around the model of current enrollment, how you recognize achievement, in terms of how the school is performing or not performing, kind of those sorts of questions. How do you manage booking scheduling systems if you're in a school? The VLN has really exposed this. If you're in one school over here and there's a timetable and a structure where kids are going to be in classes and move around.
>
> Now suddenly you're taking a kid and saying right, you're going to learn over here and that school is running on a different timetable. How do you manage that? And simple little logistical questions like that, that I think will – at the moment, the VLN is managing them because the numbers of schools involved and the numbers of students are relatively light. There's 130 schools involved and about 2,000 odd students that have some sort of involvement.
>
> Then the challenge of the fourth question is what is the role of the teacher and the situation of – like in the VLN, we have what has emerged as being a really important need and important challenge. If you have kids in the school that are attending classes in another place, who is supporting them, making sure they're getting – they're focusing on their learning? Who is the person that takes care of them, if you like, and provides that mentoring advice and guidance that teachers also do in the classroom situation where there kids there? Who's doing that?
>
> So the policy is very patchy, but that's also what we're working on, and is not really the people. That's one of the challenges I guess. How do you make a uniform system? Or not even a uniform system, but to get to a level where there's a degree of similarity in what's going on? Or do you? Maybe you don't. Maybe there's some areas of teaching and learning where you don't want to move in this direction.

The Correspondence School also has policy issues it needs to work out as explained by Interviewee #8:

> Some of the problems with the paper-based correspondence was sorta timelines of the correspondence. A youngster would come along about this time of year, and say that they wanted to do, receive the form physics. Then by the time they actually got them enrolled and got the paper-based course in front of them, sometimes after eight weeks would have elapsed. By the time that had all taken place, you've really missed so much of the course that you put passing the course in jeopardy.
>
> The problems with correspondence school is you don't know who the other kids in your class are, and here in New Zealand, often, the correspondence school has a number of part-time staff, so they break the year up into – they break the courses up over the year into blocks. So a teacher does this block, and then there's another teacher with the next block. We found anecdotally that kids hated that. They didn't like swapping from one teacher to another. It's just like having a face-to-face classroom having a –New teacher.– relieving or supply teachers, or something coming in, and people sorta having to build new relationships over and over again. So one of the big problems with the paper-based correspondence is that kids drop out.

As Interviewee #13 noted:

> but because all this grew from grassroots within an education system that was designed around the idea of a school and being a designer of a school, I think this is pretty typical around the world. But because our education was designed around the notion of a school, everything that comes from it in terms of how that school is funded, how the staff are funded, how the resources flow, how assessments and enrollments are recognized – they're all based around the idea of a school. And there's been a lot of articulated ideas around moving to a learner centered paradigm, but to be honest, that only goes as far in the policy work as impacting some of the pedagogical choices we make. It really hasn't impacted at a system level.

Interviewee #18 noted that, "getting leadership in schools to take risks and encourage teachers to try new things. As Interviewee #13 said, "so I think the world's our oyster here, but it really comes back to leadership. At the moment, sadly, in our political system and in our Ministry of Education, it is really, really sadly lacking. There's a lot of people in the right roles doing stuff and it's busy stuff, but we're lacking visionary

leadership, and New Zealand is a bit of a sad case, and it really boils down to a lack of leadership, as well as a lack of economic – a lack of money in the bank to support it."

Funding. 32% or six of the 19 interviewees also said funding was a barrier. Interviewee #2 noted that "small scale funding had been abandoned, so there have been projects that have been dropped." Interviewee #3 said,

> the problem was when the global economy tanked, the first thing we did was cut some of the smaller project such as the e-Fellow and DigiOps. Now, next year, because the government's now overdrawn, they're looking to make cuts across all government departments. So every government department is going to be told to cut two percent on their spending or some number; we don't know yet. So all that's happening is that the school is not getting somebody that they didn't – Already have – that they didn't know they had,

and Interviewee #7 added, "It's been a bit challenging because of the resources. They're cutting back, and people are coming and going and all that sort of stuff."

But then, as Interviewee #4 noted, "elsewhere in the U.K, Singapore and other countries where there's been a massive sort of injection of money, and Australia, and this kind of digital nation building exercise, we're behind on that."

Lack of research. Finally, four of the 19 or 21% of the interviewees noted the lack of research as a barrier. Interviewee #2 said with the current research we have done, "we haven't captured that or analyzed it, or interrogated it in any kind of triangulated fashion. It's just a series of anecdotal or narrative-based representations." Interviewee #12 agreed by saying, "some of the research is only focused on specific projects and not overall and what the student outcomes are - It's more, here's reporting on this project and

kind of action where there's no results as if the technology has made an impact. It's more people's opinions and reporting back that way."

Some of the research that has been completed is "not as compelling in some of the evidences that people might have liked. That is partly about our naïveté in terms of evaluation and research design from the early days. I'm not saying it's there now. But I blundered around, I'll say, and it's really difficult to do very robust, compelling evaluation and research in this area –as, I'm sure you are well aware. So, virtually I think all these items on the list are contributors and I think what has helped is when there has been a deliberate alignment of several strands of these initiatives," Interviewee #9 stated.

Future research is needed. As Interviewee #17 states, there is a:

> lack of understanding about what effective online learning looks like. I've seen a lot of the online learning which is just your traditional course parked onto an online environment, so a lack of understanding about the research about online learning. And what I've seen is some very ineffective areas and some disengaged students because of the way teachers are using the online learning space. Just because there are popsicles online doesn't make the students engaged. I guess one of the problems is the lack of understanding about effective pedagogy when it comes to online learning, looking at the research.

Research question 5. Research Question 5 asked: What does the Ministry of Education want to do more of in relationship to online learning in secondary schools? When interviewees were asked what they would like to see more of in terms of e-learning in the future, their answers fell into five themes: infrastructure, expanding access to educational opportunities for all students, research, professional development, and reforming education.

Infrastructure. Building a new infrastructure is what 10 of the 19 or 53% of interviewees would like to see in the future. The government has committed to building a National Education Network (NEN). "The NEN provides very fast, unrestricted broadband to schools, creating a new learning environment for collaboration and to access online content and services. The NEN is a dedicated network for schools. Over 20 schools in New Zealand are currently connected to the NEN," (Karen.net, 2010) with over 200 new schools being connected in the next year. Interviewee #7 stated that

> certainly over the next two or three years, ideally what we would see is the development of the national education network, a range of services, both school based and centrally provided, probably some combination and some public domain services because at the end of the day, even though we're the online services group, we don't actually care that much about owning the services. We don't want to be a service provider per se. We want to make sure the services are available. But that a whole layer of pedagogy has been built up over those services, then it becomes very easy for people to – or teachers particularly and students to engage with learning.

Implementing Broadband access is the first piece of the process in order to expand the NEN. Interviewee #8 said that,

> so at the moment, we are just looking at how we support more online learning through this unit, and it's really part of a whole program that starts with government's investment. That has resulted in government announcing that they're going to put fiber connectivity into 97 percent of their schools, and the other 3 will get satellite, and we're running a program out of this unit to upgrade school networks to be able to connect to that. Then we're planning to link everything together in a national education network, which again will be delivered over fiber with a minimum 100 MB connection. Probably the secondary schools, the bigger schools, secondary or primary, will get a Gig, and all of that we want to procure centrally to keep the costs down for schools, because connectivity costs in New Zealand are quite a barrier to participation.

Per Interviewee #3 “the new government, the Republicans, their plan was we’re going to spend $2 billion on broadband, fiber-based broadband around New Zealand, said, “Let’s wire up the country.” So that has then put a huge boost to the people who are doing content and services, because suddenly, they’ve got a whole new – it’s a big like car dealers having 100 lane highways suddenly built. If you’re a car designer and every lane’s going be 100 lane, or every roadway’s going to be 100 lanes wide, and you can drive at 200 k’s an hour, that changes the way that you design your car possibly. That’s going to be starting over the next 12 months, but it’s supposed – the idea is to have it over the next 10 years.”

Interviewee #3 continued that:

> there’s talk about now they want to build a new wire up here or a new cable here, and then another one across to Australia, so that will give us sort of another route. So once we can get these other cables put in, then the price of that one will drop. Because now people are talking about this, the owners of this cable are dropping their price, because they want to destroy the business case for this one. If they can drop their price, perhaps – Then there’s no need for this. I mean, here’s a government that spent a whole lot of money on broadband. $300 million of this is going into rural schools. Well, the whole reason we’re putting $300 million into rural schools is because rural schools, as I said to you yesterday, need to have access to the same educational resources as urban schools.

Interviewee #6 want to:

> keep going as we are. The value for money I don’t think, providing money back to schools, that sort of thing, wouldn’t achieve the cost savings benefits that we have just through our deals. So we just plan as going as we are, and with the new broadband rolled out, and all that, it’s just going to compliment it because schools have been crying out for fast speed internet and for an infrastructure. And just as a result of having their laptops, and now they can’t connect because the classroom hasn’t got a connection to the internet, and they like fast internet. So now they’re gonna have these tools, but they’re also gonna have the ability to get out there and use them to their full potential.

When asked if the TELA project could possibly be expanded to the students, Interviewee #6 said:

> it's been raised. I know as a result of this Broadband Initiative many questions have suddenly come up. But I do know the Minister has been approached by different companies wanting to do sort of one-on-one initiatives with the students. And she has a semester to find up some pertinent information. So we're sort of exploring all the different options, and whether it is – you know, what sort of what we want or not.
>
> It's a lot of money, and I mean, well, the teachers are getting this – well, it was the biggest project in the Ministry in terms of value. This would just see past that amount if you're gonna do that. I mean, you've got 47,000 teachers. You've got hundreds of thousands of students. So it's – yeah, I think the verdict at this stage is out, but I know that we're looking at all the research, and talking with companies, and countries providing recommendation to the Minister on how the Minister – place we take on this because we know that either way schools all need more access.

With these new infrastructure initiatives, the education opportunities for students will expand. As Interviewee #2 stated, "broadband in schools initiative, the National Education Network are so dominant. They're gonna take a lot of time and energy, so they are the future of online learning as far as someone like me can conceive." And according to Interviewee #7:

> increasingly, we're starting to think and do a little bit of head scratching around to what extent do we also need to extend it a little bit in terms of mobile technologies and the use of mobile phones. A nice kind of vision for the future would be in the shorter term, would be that the kids would be bringing in their own mobile devices, hooking on at school. School would become a social gathering place where they'd have a sports team or they would connect into a docking port, like the internet café where they mix and mingle with other kids but there are actual programs and learning and their learning activities being supported and encouraged and interpreted and structured by a group of people who may not necessarily be content experts.

Interviewee #13 added, "I think that's going to provide a hugely significant improvement in the quality of their online experience, particularly the quality of the synchronous online experience, as well as the quality and nature of resources that we will be able to exchange. So I'm really looking forward to it."

Finally, according to Interviewee #8:

> this program's going to take about five years to run, and cost many, many millions of dollars. But we are down here at the bottom of the Pacific – New Zealand really makes its money through exports and tourism. With the sorta whole clean, green, don't fly to here and watch your carbon footprint, the die of sorta incidental tourism or people coming during a sweep. Let's say someone from Europe or the States doing a sweep through Southeast Asia, Australia, and New Zealand, those sorts of things, those patterns are changing. So we've got to try to leverage off some of the other skills and abilities that we have in the country. I mean, a good example of that is the *Avatar*, I mean, most of it was actually made here in Wellington - At WETA, yes. It's those sorta things, and that is a 21st Century type industry, and because of the nature of the industry, it can be sited anywhere in the world. It doesn't just have to be in the UK or Hollywood, or whatever, and we need to leverage off that. So therefore, we need to have lots of skilled people that have the sorts of qualifications and abilities. To do that, we have to have the country basically joined up. We have to offer opportunities to New Zealanders wherever they are, and we have to be willing to invest in the infrastructure to make all of that happen.

Expand access to educational opportunities for all students. Nine of the 19, or 47% of the interviewees wanted to expand access to more educational opportunities for all students in New Zealand through e-learning. According to Interviewee #5 "the Ministry of Education wants to use better change management programs to look at what the systems things that need to go in place to create the sorts of things that I was doing in my school, but to do it at a national level." Interviewee #1 added, "we'll probably start concentrating on going straight to the kids. Telling them what they can and cannot do

because they know anyway, and then putting the force and putting the pressure back on the schools and phoning their parents" in order to provide more opportunities for them.

According to Interviewee #11:

> once we've got everything digitized that schools can have access to our resources and we'll try to find ways in which they can just subscribe, and once they get to know what kind of – what resources they've got, it won't be an issue. And as we are funded by the crown, everything we've got is – should be for everybody.

Interviewee #9 went on to discuss expanding e-learning opportunities to various levels of students. They said,

> we haven't talked about this explicitly, but the Digital Divide phenomenon and ways that that's still being addressed – basic access issues. They're being tackled and they need to continue to be tackled. I think – again this is happening in some areas – I think it would be wonderful to see it becoming more widespread – using schools as real community hubs for families and the wider community to also get opportunities to engage in online learning. That's really important. I know it's outside the scope of your research, but we're lucky that we have got some pretty smart use of online learning in the tertiary sector – Massey University runs significant proportionate of its courses online. So, the more we can do in the secondary area to equip people to be lifelong learners as the mission statement would say!
>
> Again, I think looking both up and down, one of the things I've really loved being able to get involved with is the use of e-learning in early childhood because what we've seen is that you get these really sophisticated, competent learners coming out through the system. So, I think in a few years the impact of these younger generations coming into secondary are gonna really be quite profound. I think we need to make sure that we look across the learning lifespan rather than just secondary education. I think we are largely doing that, but there are always things that we could do better to make sure that it's connected.

Interviewee #12 also shared, that "I know one of the initial sorts of ideas in New Zealand was that the correspondence school – the New Zealand Correspondence School would become a virtual school." This would provide additional opportunities to more students. Interviewee #19 said:

> well, the future as I would like to sort of see, and all of our rural secondary schools that option of online learning and face-to-face learning almost being seen as an actual part of the whole educational experience of teachers – of those students. And I'd love to see most of our teachers doing some online learning because an actual factor does change the practice. I don't know what the model – what model of sort of online delivery.

Finally, Interviewee #15 shared their vision, that

> we decided that one size does not fit all for our students especially all of the particular different needs, so we've got to be trying many different ways of connecting with them. But one is implementing the new system for records and growing our online courses, and then putting on more courses onto the new system that will be available for senior students. And also it's really educating everybody about it and having people feel comfortable using the tools and with using the new system. Our biggest push will be to train the teachers so that they feel comfortable with using the tools that will be available on the new system. So that when they're working with students and parents they'll be able to explain how to do things. And for them to understand the processes in which we created, how we create, online resources and how they will interact with the system and with the students. So it's quite a bit of educational learning curb issue for our school with implementing the new system, and that will be able to give us focus throughout the year, which will be for next year we'll look a lot different I would expect.

Research. 42% or eight of the 19 interviewees wanted to see more research done in the area of e-learning to "see what happens in developing that rich online environment", said Interviewee #1.

Interviewee #2 shared that there "is a system of secondary assessments run by New Zealand Qualifications Authority (NZQA) that does digital assessment" which can help in gathering data on the effectiveness of e-learning. Interviewee #4 said:

> research and evaluation supporting the programs should be strengthened and informed. It should be the evaluation of what we've been doing. We've been asking the same questions repeatedly, and we're asking new questions while taking new approaches. We've got somebody who's just about kind of conceptual framework for that now, looking for them to create options for that

implementation – for an implementation of evaluation around not just the models, but each of the projects as a whole.

Interviewee #7 added:

there's so much happening in those various pilots and projects that will then end up being absolutely relevant to what happens with the fancy new broadband network. This is the experience of how it can be made to work. And it's different, the way you teach. Using these technologies is different and it's building up.

Currently,

there is very little evidence that the majority of ICT initiatives to date actually improve student outcomes. Analysis of a large meta-analysis noted that initiatives that blended online and face-to-face conditions often included additional learning time and instructional elements not received by students in control conditions. This finding suggests that the positive effects associated with blended learning should not be attributed to the media, per se, according to Interviewee #16.

Sharing what is happening is what Interviewee #17 thinks there should be more

of.

I think I need to continue to pilot various e-learning projects and some of that's happening at the moment through the Virtual Learning Network. And within those projects, there needs to be something that brings together refining of those projects. I know I'm involved in one at the moment that had to deliver provisional learning online. So this year, I'm working with a group of teachers on that. But we need to really share our findings. We obviously know how we're using those, how we're constructing those findings around e-learning is around research. So we need to share what's working.

Interviewee #17 says:

I guess what I'm saying is just future of online learning, we need to have a more theory based to it, develop models of implementation, approaches and also, use – so what I'd like to see is teachers can see online learning approaches that have worked and using and integrating things like Digi school, which is our gateway to digital resources. And so a model of learn to learning you'd see the video conferencing and you'd see the use of the digital learning objects. And you'd see

> the students encouraged to use web tools to create. And then you'd see the face to face and perhaps the work in the community.

Finally, Interviewee #9 stated, "I think we've done a lot of work around the evaluation – the e-learning evaluation – but we need to continue to do that – continue to develop and promulgate really compelling evidence. It's very, very important."

Professional development. 32% or six of the interviewees believe that professional development can be expanded and restructured.

Interviewee #4 said,

> we are looking at a capability model which addresses pretty much all of those issues but just has a slightly different language around them, and those are used by several jurisdictions including Australia, where they've got something called The You Potential, which is focused on the teacher capability. We're looking at adopting and adapting the BACTA model, which is a new framework. And we reviewed eight from around the world.
>
> This holistic view of the school, and that it's actually raising the capability of the school as an institution. So it's not just looking at teacher skills, but it's giving the leaders the kind of confidence and capability to make good choices around this to develop their own skills and knowledge, et cetera, and to be a little less fearful around infrastructure.

Interviewee #8 stated:

> I'd like to see more support given to teacher capability, and also the development of quality New Zealand based content and services. Because within a global community, it's easy for a small country like New Zealand to lose its identity, and you want to be able to keep the uniqueness of New Zealand. So we have to make sure that we keep allowing that unique content to be developed and to be transmitted in the way that we roll out anything in the ICT arena.

And finally, Interviewee #13 stated,

> one of the areas that needed professional development – and we're hoping to in this next iteration – was to make available a whole lot of templates and educational resources behind each of the elements that are identified in that

handbook. And that's something I'm really looking forward to finally getting my teeth into again – having a chance to complete.

Reforming education. With the new investments in the infrastructure, six of nineteen or 32% of the interviewees stated that this is the opportunity to reform education.

Interviewee #2 said:

> I'd love to see some exploration of the potential for teachers to see themselves as inquirers on a similar conceptual level to the students seeing themselves as agents of inquiry. The classroom becomes a place where inquiry is conducted by all the present humans, not just by the little humans being told what to do by the big humans. That to me, is a synergy between the broader curriculum, and the way we've tried to position teaching as inquiry, and the third strand being digital learning the notion of that we're providing either a digital democracy, or open government, or a fractured societal hierarchy. So fracturing the nature of hierarchy in society, so if that's happening with the open government movement, it might also be happening with the small scale government of the classroom.

Interviewee #5 agrees and

> thinks we are here moving much more to an inquiry basis for learning where students have control over the things they do, we're not there yet, but that means that students may need bigger slots of time to be able to focus on particular things rather than 50 minutes here and then you're off to French. So I think there are big systemic changes for us in the future. I think it will become better to be just – we won't be calling it e-learning, it'll be learning. Already I can see the blend of environments are actually, they're not part of the norm, but they should be part of the norm.

According to Interviewee #7 kids are asking for this reform.

> Last week he was doing a lot of work in that area on various awards and decided to shape a few projects around how we would actually provide advice and guidance around the use of mobiles in the classrooms. So the point of that, again, is here is information, advice and guidance that's available to help you in your practice, and those things moving forward. And a lot of that content related stuff is coming in via the applications and services that the kids are accessing over the web. That would kind of be my vision and would like to see that happening, and

> much more of the students actually pursuing learning interests, but in a structured way. On one hand, pursuing their own interests, but they're doing it in the context of assistance from an experienced educator that is facilitating and leading them and mentoring those kids to be learning the kind of right range of things that they're into, basically building up the school and beyond."

Interviewee #14 is seeing similar things in his classrooms.

> Ultimately I would like all the kids to use the tools. Now, the reason I'm using – when the kids have their phones, and their mp3s, this is technology which the kids have. The last several years as IT has become more available in schools, and teachers have been encouraged to use IT in class, it has always been what has been provided to the teachers, or by the teachers. We have KnowledgeNet as the school management learning system - the site will naturally develop over the years, because with the new curriculum, is that the standards themselves have gotta be changed over a four-year period. So, ultimately all the standards that currently form the Stats course – they've gotta be changed, and modified, and replaced with new ones. So, the site itself will change, but my methodology of teaching probably won't in terms of Stats and VC.
>
> That's the – unless the Polycom units die and wear out, in which case I'll probably convert to a – we now have VC online. So, the Polycom system is now developing a website-based system similar to a W-Connect. Some schools, the Southland cluster of schools on the virtual learning network, they all use Adobe. So, we have some kids learning with VC. Our history kids have been learning through Adobe Connect. So, not just VC, but some schools are now teaching using Connect. So, if the Polycom fails, could end up just transferring over, and using Adobe, which is quite useful, because if I was to convert my class over to either VC online, or to Adobe Connect, then I could do it from within the classroom, rather than a separate room. I could do it from home if I wanted to.
>
> What would be nice, if I could do my teaching from home. The natural extension of this would be that school would – could ultimately cease to exist as a physical place that you go to. It should reach the point where student doesn't necessarily have to go to school to learn. If they've got access to tools such as VC online, or Adobe Connect, or Elluminate, then they can log in at home, face-to-face with their teacher, face-to-face with their classmates, and do their learning that way. They don't actually have to be in class. Statistics, other VC classes, one lesson per week, and the kids have got their homework, and they communicate with their teachers via e-mail or text. One of the students last year called me at home with questions over the homework. They won a sports tournament, and their teacher thought they had to do some work. Students are as much more forthright in contacting their teachers out of hours as well.

> So, ultimately, just early days yet, I'd like to see much more accepted, becoming more the cultural norm, rather than a challenge of instruction for kids to learn interactively, taking more control over their own learning, more initiative, using the Internet to learn the lessons before class, and even – well. Part of the curriculum is for kids to be independent learners – to learn under their own steam without guidance. Give them resources, show them how, and the encouragement, and the reason, and the motivation to, and they'll do that.
>
> It's a slow cultural change, and ultimately that is what I would like to see happen: A change in perceptions of how to teach from the teachers' point-of-view, and change in perceptions of how to learn from the students' point-of-view, and a change in what to expect from the schools from the parents' point-of-view. What do the parents expect us to do for their kids, and how can they help the kids learn making available the IT stuff that they have at home? Encouraging the kids to go online, and do their homework, and to communicate with their peers at home, for the kids to be proactive, to use their IT gear to communicate with each other, to learn from the resources that are given to them online.
>
> There are teachers saying, "Hey. This is the technology, which the kids are good at using. Let's use that technology, not the one that the school has spent money buying, and wants the return from. Let's use what the kids can do to make them learn, and to get even better at what they're doing." They're already demonstrating to us what they're good at, what they understand, what they can use. So, let's use that to teach them what we want them to learn.
>
> So, it's a three-way cultural shift. Teachers having to change how they think about teaching, and how they use IT, and what IT they're using. For the kids to change their heads about how they learn in class, and how they can learn outside of class, and for the parents to change their heads about how they can help their kids at home learning with the tools given to them.

Interviewee #17 adds,

> so yes, making sure the future of online learning is a blended approach and creating models of that so other teachers can see them. So it's about taking the piece of what we know works and complimenting it in an online environment, not chucking everything away and just going all right, we're online now.

So developing models that takes the best of both worlds, and Interviewee #19 "would like to see it become very much a mainstream option alongside face-to-face teaching."

Interviewee #19 concludes,

> so I'd love to see right across the New Zealand system where online learning is an integral part of that whole educational experience of students because I can see some huge benefits for most of our students in terms of their growth as learners. And the other thing I'd like to say is at the moment our activities seem to – on a senior secondary part of the system – it would be really good to see that come down and head towards the primary elementary sort of area of the schools. That would be really nice and the other thing, which is starting to happen particularly down here in the Province of Otago, and it's for the urban schools to also sort of begin embracing that so that we're actually getting that broader interchange of urban and rural starting to happen.

Unanticipated outcomes. During the interviews, participants were asked if they believed the model of e-learning implemented in New Zealand could transfer to other countries. They were also asked if they had any advice they would like to share with others implementing online learning. The results of these unanticipated outcomes are documented here.

Universal implementations. When asked if New Zealand's model of implementing e-learning could work in other countries, interviewees unanimously agreed that it could. Several education officials have come to New Zealand to see how their program has worked, and the interviewees were able to identify a few areas of concern that were addressed. But overall, the interviewees believed it would work now that "there has been greater correspondence between nation states over time, so they are more likely to applicable than they would have been 30 years ago," stated Interviewee #2.

> Interviewee #3 has visited with education leaders from other countries,
>
> And when they've come here, the Saudi's for example, that's quite different, because they've got so much money they can do anything they want, but they've got so many problems in Saudi Arabia. It's like the 14th Century. So they have 21 periods are learning Arabic or the Karan. So every other subject was on the

> religion periods. They have no art curriculum in Saudi Arabia, so there's no artists. There's no art galleries. There's no art curriculum. So when they come out wanting to talk about e-learning, it's a difficult conversation to have. Somebody comes here from Sweden or Singapore, even though their countries are on different sides of the world, one's Scandinavian, one's basically Chinese, they both know the value of creativity and they've both got more similar views.

Interviewee #7 adds,

> I definitely thinks the overall approach would work. I think the New Zealand curriculum is kind of unique, I think. I don't know. Well it's not really the New Zealand curriculum. It's more the kind of Tomorrow's Schools idea where the schools are relatively free, within the curriculum, to determine their own teaching and learning program. I think that will help. I think in a situation where you had more rigid and centrally determined and quite structured curriculum and learning programs that schools are required to follow, the harder it would be for you to introduce online learning. We're not inventing the wheel here. We're mirroring and learning from everyone else overseas and we're just part of a worldwide movement anyway. So nothing here really is that unique. In fact, if anything, we're following some of the bigger trends.

There are also cultural barriers that can affect this implementation. Interviewee #3 said,

> so Singapore, they've got an even bigger challenge, because the Asian – and this is a real stereotype, but the Asian way of teaching is in some ways the antithesis of creativity. In a classroom, everyone's lined up and the teacher's telling them stuff, and they're writing it down. Whereas, your average American classroom or Kiwi classroom, that's not the case. So I think some things can translate relatively easily; other things not so much. When I've gone and spoken to my colleagues in other countries, everyone's facing the same challenges, whether it's PD, whether it's infrastructure.

Interviewee #5 added,

> there are cultural barriers to the communication, as I said before, and there are four societies where higher education are important. Then you look at it the same kind of change implemented that you do with – you can enable people to – so you have to be totally aware of what the culture of a class is before it's successful, and you have to adapt the program to take account of the culture.
> Interviewee #8 adds,

> I think that's really difficult to do that, because people have got their own sorts of – their own history, culture and heritage, and the way they want to deliver education in their own circumstances. I mean, we share a lot with Australia and we, each of their states, because their system is quite different than New Zealand, their states are really like your states in America, although they don't have school districts.

The infrastructure has a big effect on other countries as well. Interviewee #3 "was in Thailand last year. They said to me, "How are you with the providing hardware?" I said, "It's not that great. It's about one computer to every seven kids." He looked at me and said, "We have one to eighty in Thailand." So that's a guy who was in charge e-learning for Thailand. So a guy who's in charge of e-learning for Thailand and he's got one computer for every eighty kids on average." Interviewee #19 adds,

> each country's got a sort of a certain history, which will make it easier or more difficult. For example, I think in the states you already have a sort of a district type model where you've got a more top down conglomeration of things, which in some ways chops out that sort of grassrootness ownership from the schools up rather than from the Ministry down. And probably our ministry is not too dissimilar from some of the North American districts. So I think there would be difficulties even from what I can see and what I've read about changes and pedagogical sort of implementations which may facilitate or may hinder the particular model.

Interviewee #19 also adds,

> But I would like to think that teachers as a professional group can see the merits of the type of model, which we developed over the last eight or nine years. And perhaps see some relevance beyond a New Zealand context, which I get sort of nervous what's starting to happen within New Zealand with the urban areas starting to look out what's happening in the rural areas as a path towards that more personalized learning. It's a path towards personalizing learning for students, and I think there's lots of ways you can do it.
>
> I'm pretty sure what you're doing in the states is a particular path, and I think each country probably have got the unique context, which means that there has to be a degree of a customization to that sort of situation. So the simple

> answer is I'm not really sure, but I think there probably is a lot we can learn from one another's models of what we're doing.

Interviewee #3 offered this advice to other countries,

> It's not going to go away. Many countries have just taken their resources, put them online, and thought – and called that online learning. We didn't need to go down that path, and I'm glad we didn't, because that hasn't really shown to be working. It's sort of a blended approach, where you've got a mixture of face-to-face and online, which reflects the ubiquitous connectivity that's coming, and now you can be in the depths of Nevada and log on 24 hours a day to a website.

As related to the ICTPD, Interviewee #4 said, "so in terms of P.D., there is no reason why this approach would not work well. It's backed up by international research and local research." Interviewee #13 also adds,

> we were invited by the Malaysian government two years ago now to implement a model of cluster-based professional developments. Now the focus was on the professional development with and around the use of ICTs and eLearning. It wasn't specifically around online teaching and learning or courses as we're talking about here. But the emphasis was on that how do you engage teachers in a cluster-based way and expand the horizons of the system? And so we had teachers doing what you and I are doing now. We introduced new technologies that are around them to connect. For me, it was very important – very rewarding. You couldn't have a system more diametrically opposed to what we are in New Zealand, but we made it work, and it looks like it's going to get us an opportunity to carry on. We're just in the process of negotiating a follow-up now with a much bigger trial.

To assist other countries with implementation, Interviewee #9 states,

> I think elements of what we're done here are already being used in other countries. I guess what's useful is that New Zealand is quite a small country with quite a small population relatively, so you can try things out. The fact that we don't have an additional bureaucratic tier between the Ministry and school management, governance and administration, is probably quite useful. Most jurisdictions have some middle tier whether it's a state level, local authority –

> some kind of additional administration. But I would've thought that – provided the units of scale – that it would work well. Perhaps not – and it might only be working at a state level rather than at a national level – but I think many of the aspects could be readily replicated.

Interviewee #16 provided a working draft of a new document the Ministry of Education is working on in order to provide learning interventions through ICT that other countries might find useful in implementing an e-learning program.

> It is a draft version of an ICT Strategic Framework that: (a) identifies the intermediate outcomes sought by the wider education sector (early childhood education, primary, secondary, tertiary); (b) links the intermediate outcomes to ICT-related opportunities to improve (Curriculum, Capability, Content & Services, Connectivity and Compatibility); (c) explores what ICT-related investments might take advantage of the opportunities and support improved outcomes.

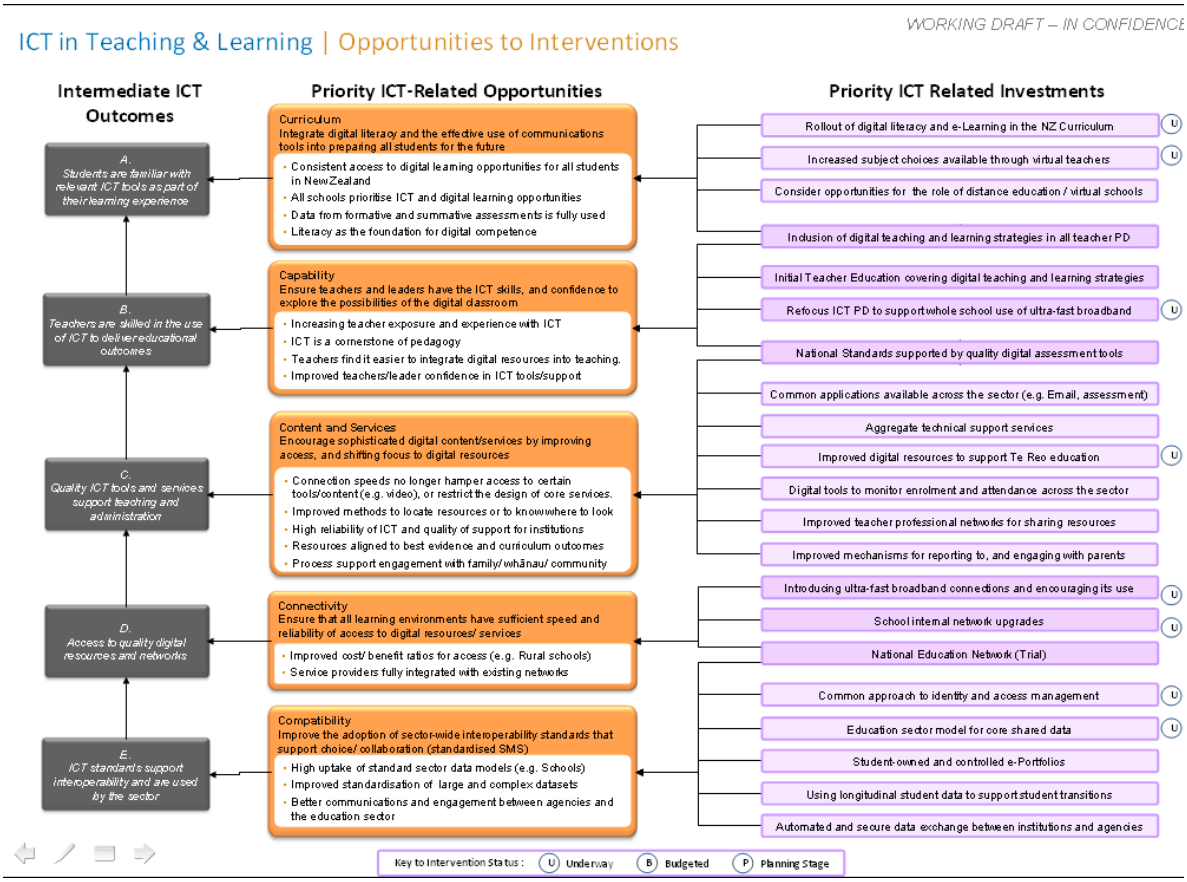

Figure 6. ICT in teaching and learning – opportunities to interventions. Adapted from: "ICT in Teaching and Learning – Opportunities to Interventions," by the New Zealand Ministry of Education. Copyright 2010c by the New Zealand Ministry of Education, Wellington.

Interviewee #8 said,

I think the thing is that it's a situation where the, as I've often said before, there's a lot of wonderful stuff that's happening globally. Now we actually have – we can actually get access to that. Once upon a time, it was difficult to find out what happened in even schools up the road, let alone schools in other international jurisdictions. Now we can do all of that. So I think that the circumstances are such that we're able to share a lot more, and there's a lot more willingness to do those sorts of things, and that's sort of been enabled by the technology.

We can also learn from other countries and our students as stated Interviewee #3.

In fact, about three years ago, the Australian government spent $85 million on developing a family blocking package. The idea was that parents have got to download the software, put it on their computer at home, and it will block all access to porn, or bad things, or whatever. So they launched this with a huge fanfare, $85 million. A 16-year-old boy named Tom Young, he cracked it 35 hours, within two days, so that was all over the paper. Then the Australian government pulled it, so this boy then became internationally famous.

We had a cyber-safety conference a couple of years ago, we brought him over to speak to us. By now, he was older, he was working for Symantec or something like that, within a year. I read that he just got some job in the U.S., so he's, like, 19 now. So he had an interesting viewpoint. He said, "My friends," this was when he was 17. He said, "My friends and I have all been looking at porn since we were 13." He said, "It hasn't done us any harm." Everyone kinda, the audience had a bit – everyone kinda laughed. Some of the women looked horrified. He said, "That's the reality of the situation." He said, "We haven't all turned into crazy," he's a very smart guy for a 17-year-old. He said, "The web won't turn us into rapists or child abusers," he said, "It's just part of being a teenager." Now, I remember finding a Playboy in my father's cupboard when I was still 16 or whatever. You look at it and you put it away again. He said he thinks that people less than 13," he said, "Once you're a teenager, you see that and kind of understand it. It doesn't make it bad." He said, "I don't think that kids less than that should have to see that stuff, because they're not really able to understand it."

Then he said something which was, in fact, verified by psychologists. He said, "Anyways, there's a lot worse things around than porn." He said, "It's just that people think negative about porn." So the psychologist got up and said, "When I researched what affects kids, it's actually effective like suicide, autopsies, and other abnormal issues." When we had the conversation, that was interesting, because back in 2002, 2003, 2004, when people started going online, pornography was the real big thing people worried about.I've spoken to my – I've got three teenage nephews, and when you speak to them, because I asked them after the conference, they said, "Oh, yes, there's a website called setyoursites.com," and they said when you go there, it's pictures of people who have committed suicide by shooting themselves in the head with a shotgun, so there's really nothing from the chin upwards. One of my nephews said to me the same thing the psychologist said, he said, I've been to some of those porn sites. He looked nervously, saying to his uncle, "I've been to some of those porn sites, and you kinda get excited," he said, "but that's just porn." He said, "But when I went and saw that person with their head blown off with a shotgun," he said, "I couldn't stop thinking about that for about two weeks afterwards." Because typically having sex is something that normal people – Blowing your head off is abnormal.

> He said, as a teenager, he found that very hard to grapple with. That was what the psychologist said, things like anorexia websites, websites that tell you how to be an anorexic, autopsy websites where there are websites just to show you people cut apart, he said when they've done research globally, that's actually what's concerning kinds more, but it's the porn that the adults focus on. As an adult, you can rationalize someone pulling a gun to their head, you can maybe understand someone killing themselves, but as a parent, these are the things we should be worried about. So our Internet safety group that we have here in New Zealand can do all this stuff for us.

Interviewee #6 has also worked to learn from other countries during the TELA program.

> We looked at the Victorian model in Australia. That's what TELA was based on. And sort of looked at a number of them like the U.K one, and sort of decided – I think [inaudible] on the Victoria model, but I think we've kind of fine-tuned it definitely for us, or kind of maybe got rid of some of the issues others had, like too many supplies, or one year you go out for one brain, and then another year it's a different brains, you have to switch. So yeah, I think this one works really well.

Now that we have figured out the best way to make this program work, Interviewee #6 wants other education leaders to

> come talk to us. We've been there, done that. We've kind of got an answer for most things. And the thing is that it has been a success and we've been able to do it within budget, so it's definitely doing all your prep background before actually, and backing on anything because there's a lot of lessons learned. Then you can sort of learn from someone else's mistakes and it's all good.

Advice/lessons learned. The final question in the interviews asked if the interviewee had any advice to share with other people considering implementation of an online learning program. The interviewees' advice is below and has been organized by similar thoughts.

Several interviewees recommended putting together a strong team with a vision. Interviewee #13 said,

> I think whatever it is, it has to be led by a vision and visionary leadership. And the vision has to be about transforming teaching and learning for students – for young people. It can't be led by simply responding to how can we save money? Or how can we stop our school role falling and those sorts of things? Those will all be prompts, but to actually make it succeed, you have to be driven by outstanding inspirational visionary leadership. To be honest, that's – when I look at the examples of what's happened in New Zealand, that's what's made it work.

Interviewee #18 gave similar "Advice – Gather a great team of likeminded people, start with students. Communicate with students and parents so they understand what the choices are. Which moves them along. Do not worry about the technology, it will come along."

Interviewee #4 added,

> it needs to be well thought through, and it needs extremely talented people who are knowledgeable in that community to practice in how they function and have an investment in the community and understand the knowledge demand that they're working with to actually run those things. They're not done well centrally. They shouldn't be done centrally at all, other than maybe the funding provided to make them happen.

And within your visionary, team, Interviewee #12 suggests:

> to start with the students and teachers online first, then work around and you have all the right people in place, then working together and it's balanced out, and so I think that's why everything's been so successful and it's all been grassroots and not top-down managed. So there's more buy in from the teachers. They see that it's working in their classrooms and like doing it. It's not another thing that they're forced to do in the classroom.

The next set of advice involved the creation of a plan. Interviewee #7 said,

> the main piece of advice I would have would be to start with student engagement. Work backwards from that. What is it you're trying to achieve in the "classroom" or in the learning situation of a virtual classroom? Start with that and then work backwards – what are the capability issues that emerge from trying online learning environments? What are the structural issues that emerge from having kids online and it all kind of flows backwards from that?

Interviewee #16 shared, "Motive: Be clear on what you are doing and why you are doing it. Often online initiatives in education are conducted as an attempt to corner a market and sell more software/hardware." But also realize

> that people change when they're on the program. You start out thinking you're going somewhere, and you end up somewhere quite completely different. And then, you go, 'Oh, I wish I'd known what I knew then. I wish I had another three years. And why did they allow us to go through that whole thing of just reinventing stuff? I mean, there's a school just down the road that's doing it perfectly.; But it actually acknowledges that pace of development and change that is required for people to make that kind of personal professional journey, shared Interviewee #4.

Interviewee #15 adds,

> just don't rush it. I feel you have to be very careful and concise about what you want. You've got to know what you want out of it before you start really, and this is a learning adventure and it can be quite hard for some people. I just really believe that supporting people with e-learning helps.

Remember who your audience is when planning is the next consistent piece of advice. Interviewee #2 said,

> the lessons we've learned are partially contextualized, but they are contextualized around the basic professional desires of a teacher, the basic learning needs of a student, and I'm assuming there's a degree of international portability around what teachers perceive their role to be, and what learners needs are.

Interviewee #4 added,

> as I'm thinking about that, that one of the key drivers in many professional communities here is the professional knowledge sharing, but also the content. So

> people like lesson plans, unit plans, ideas, resources, et cetera. So content is an important part of that. – your average teacher in the classroom is looking for ideas, looking for connections with other professionals and so on, but in a kind of FAQ, help me, let's make it connect kind of way, not necessarily a huge long kind of I'm immersed in this community. There are differences between the people who are working within – who are immersed within ICT and e-Learning and leading the change in how they would use technology than perhaps your average teacher who's looking for answers and help and sort of things. They are a part of the community and feel connected to a wider English community or science community for example.

And Interviewee #16 reminds people of

> Professional Development: One of the biggest challenges (and the most important for improving student outcomes) is ensuring the teaching workforce (many as digital immigrants)[1], have the skills, confidence, and ability to drive online learning in a way that supports students. Teachers should be aware of what online learning does well, what it doesn't do well, and how this fits within the kinesthetic, verbal and social-interactive strategies that are available within good teaching practice.

Finally, interviewee #19 added,

> our experience is the clusters, which have been successful have had groups of quite passionate people sort of driving us, and they are people in recently senior management positions in schools where they've been able to make and take those decisions and know that the schools will back them. So I guess it comes down to having that sense of vision, and having the energy and passion to really stick at it, and having schools behind the initiative really getting the initiative. And it would really help if the Ministry was also fully funding it, but what we're finding is that's coming later, and that's gradually starting to happen.

After you have formed your plan around your audience, research and policy come into play. Interviewee #8 said,

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[1]http://www.marcprensky.com/writing/Prensky%20-%20Digital%20Natives,%20Digital%20Immigrants%20-%20Part1.pdf

> my advice to people would be to search widely and talk to as many – find as much information, talk to as many people as you can, and look at the outcomes for kids before you go invest lots of money. I mean, some of these, sometimes you've got an organization that's actually proposing a technical solution, and the technical solution may be a very attractive technical solution, but it might not actually if you look at the outcomes that you want down the track. Sometimes these – a technical solutions looks very attractive.

Interviewee #2 adds, "take time to examine the current discourse of the folks who's behavior you wish to influence. So get the language in your head and sell it using the conceptual framework. Find the key change-makers."

Interviewee #2 also added

> to check your sense of perception relative to whatever, language, progress, acceptance with a range of sounding boards. So you know, and then that can be formal or informal depending on the nature of – the danger of when things become formal is that possessions become formalized and people say what they feel obliged to, rather than what they might say over a coffee.

Interviewee #4 offered a lot of advice at

> looking at what works and doesn't work, and we've done a scan of what people are doing overseas and what works and what doesn't work that the model that we've got is actually very, very strong fundamentally because it lines up well with what we understand about good practice.
>
> But if you are trying to create a system which is philosophically based around this sort of approach that New Zealand takes towards its curriculum, which is quite an open access curriculum based on local needs, et cetera and a set of guiding principles as opposed to being restrictive and syllabus based with a lot of flex and a lot of local ownership, then, this works really, really well because what we're doing is putting those tools into people's hands and actually saying, "We trust you to do this." But we only trust you 90 percent. We don't trust you all the way. So we're not just going to give you the money and use notes in a tattered envelope and leave it for you and push it under the door and never hear from you again. There is some accountability and responsibility with that. But what we're not doing is taking a punitive approach or prescriptive approach.
>
> On the flip side, that means there's a lot of trust involved even if you run it in a slightly paranoid kinda way. There were a lot of unknowns, so it's a lot

> harder to measure value for money and causality in terms of the P.D. inputs and outputs. And so it's not all roses. But what it does allow you to do is to create a kind of coherent national approach.
>
> So from a policy maker and implementation view, it's just avoiding all of those basic tenets of building communities. Build it and they will come. Understand your community in terms of its breakdown, who will be active, who will be lurking and so on and metrics on that. Getting talented people in place who understand these sorts of things and that are embedded within the community. Don't have it as your only approach, and understand the fact of failure will be your constant companion. But that's okay as long as you haven't spent $8 million implementing the solution, and you've gone for quite an agile, low cost solution where you actually invest in people and not the platform, more so than the sort of wingdings that it goes with.

And Interviewee #2 states, the "virtue of a grassroots model is when 80% of your schools adopt a model, it's really clear that you have a mandate to legislate for the 20% that haven't, just a side that a colleague ran by me today." Interviewee #4 adds,

> I think on the flip side, though, people also, while that's quite a grassroots approach that we take, and there's a lot of benefits to that, the flip side of that is that people want more guidance. Criticisms are that we let people reinvent the wheel every time while we're doing that. And I think that there is an argument to say that we could do a lot better with knowledge management and taking a knowledge which is quite tacit and making it more explicit as a response to that.

Throughout this process, their interviewees say to keep an open mind, that "there is no one solution, and there are some great examples here," shared Interviewee #4.

Interviewee #2 says to:

> Celebrate success. We are risk-takers, but that risk-taking can be supported by good leadership, whether it be at the school level or – and communities of practice are the other key. Establishing communities of practice, which kicks back to the notion of having sounding boards available, which goes way back to the notion of everything has inquiry, not just learning has inquiry, but life has inquiry.

Interviewee #9 adds,

> I guess really just to repeat what I said before – having the student at the center and make sure all the components are aligned provides a good start. I guess the flip side of that – I think it would be naïve if anyone thought that just by investing in the technology or just by investing in professional learning or funding policy – so I guess it is that deliberate and systematic combination of investment and strong championship. So, I don't think there's anything else. Give it a go! Go out and do it! You know it's never going to be perfect, so be prepared – a bit of action learning!

Interviewee #15 says:

> there's lots of different approaches, and what we're doing is investigating what's gonna work best for us. But we seem to be getting it, and yeah it probably would be a good case study. I think probably to be really open-minded; I'm not an e-learning purist sort of thing. I believe in using what's gonna work, and in catering for all the different needs because everyone learns differently at different paces, so we need to be able to cater to that. Whether it's synchronous or asynchronous, I don't think it really matters; synchronous is great in the ideal world but we have restrictions. But for us as a distance education provider we are quite flexible, which is a bonus for us. So that's a real benefit for them, and I think you just have to be open-minded, and the biggest thing is to give teachers or any user of the systems you're gonna use give them plenty of support and encouragement of how to learn online that's a really big thing.

Finally, Interviewee #4 says, "Is it perfect? No. And there are certainly areas that we can improve in and so on and so forth. And there are things like the constraints around infrastructure for example." Interviewee #7 finishes by saying, "I certainly would not want us held up as being exemplars. Rather we're just a group of people on a journey that is very similar to a group that is going on in Australia and the people I worked for."

Key Observations

After reviewing and analyzing the interview data, several key observations were made about the e-learning initiatives happening in New Zealand's secondary schools.

An observation heard over and over in the interviews is that the focus is on students and teachers. Teachers are given the freedom to develop their own professional development around their specific needs, which has led to the creation of all of the programs described in chapter four. The MOE started with the ICTPD program and told the schools and teachers "this is your program" and let them design their professional development around their needs. From this program, it seems that the early adopters of these ideas were from the remote regions of New Zealand. They saw a need in their communities to collaborate and share resources, knowledge, and abilities to develop distance learning opportunities for their students, which have expanded across the country.

The support and trust of the teachers from the MOE through the ICTPD program allowed teachers and principals to create the Virtual Learning Network, which created the need of the TELA program. The teachers were provided the professional development, were given the tools they needed to teach with through the TELA program and then continued to collaborate and build a professional learning community through the TKI portal.

Another observation made from the interview data was that the ideas that made the e-learning initiatives in New Zealand successful were also the same ideas that were barriers to implementation as seen in Table 5 below.

Table 5

Benefits and Barriers to e-Learning in New Zealand

RQ2 – Benefits and Unexpected Outcomes	RQ4 – Barriers to Implementation
Access to new educational opportunities through VLN,TELA Program	Infrastructure and Technical Support
ICT PD	Lack of Professional Development
Curriculum and Pedagogical Change	Slow change of teacher and community mindset change
Grassroots Effort	Leadership, Policy, and Funding
Professional Collaboration	
Research	Lack of Research

Access to new educational opportunities through technology was a benefit seen by many who participated in the study, but they were also aware that several communities, schools and families did not have access to the Internet, computers, and teachers which has halted the growth of these programs to every school in New Zealand. ICTPD is one of the most successful programs from the MOE, but it has not expanded, so after the three year program, there is no support from the ministry to continue and grow the initiatives they have started in the individual clusters. While some schools and clusters have seen a change in their teacher's mindset and change in teaching methods, other schools and clusters are struggling with this change. This also has to do with the leadership and support at the local and national level, which varies within schools and clusters. Finally, the little research that has been done has shown e-learning as an effective and positive approach to teaching and learning, but more needs to be done to

continue the support. As seen from the interviews, the benefits to New Zealand implementing e-learning have also been the barriers to the growth of these initiatives.

The support from the MOE, has given the schools and teacher ownership in these programs and has allowed them to grow and expand throughout New Zealand as well as around the globe. New Zealand is a leader in e-learning for K-12, as was seen by other countries coming to visit and learn from their experiences. Their model is being implemented and is working in schools all over Asia and Europe. Although they are viewed as a leader, it was a commonly heard in the interviews that the New Zealander's do not see themselves as leaders. They feel that they are just doing what is right for students and teachers and do not view it as innovative.

However, they are seeing the role of the teacher changing to becoming more of a facilitator of learning rather than the sage on the stage that shares all of his/her information and students regurgitate it. With the new technology and pedagogical approaches, teachers can individualize and personalize learning for each of their students no matter where they are located in the country. The MOE, administrators and teachers are having to rethink what the role of a teacher and a school are.

Finally, a theme heard again and again throughout the interviews was to keep a variety of people on your team to start and grow your e-learning programs. Research, capacity and capability, infrastructure, and online services working together at the MOE was key to the support of all of the e-learning programs. If they are out of synch, the program cannot grow.

These initiatives in New Zealand started at a grassroots level, but the guidance from these four groups within the MOE's e-learning team has helped foster collaboration among schools, teachers, and students throughout New Zealand. Ministries of Education in other countries have mandated initiatives and poured money into technology and gadgets similar to those found in New Zealand without the same results, and as one Interviewee #8 stated best, "it doesn't matter, you can put all gadgets and bells and whistles, and wires and cables, but if you don't actually change the hearts and minds of the people at the end of it, all of its just a wasted investment."

Chapter V: Conclusions

This chapter presents an analysis of study findings and related conclusions. The purpose of this study was to describe the current e-learning initiatives and projects for students in secondary schools in New Zealand. The second purpose was to examine the benefits and barriers to implementing these initiatives. Finally, a third purpose of this study was to discover the implications these projects have on the future of education in New Zealand.

A review of the literature was conducted in order to identify what New Zealand and other countries have done in terms of implementing online learning and to discover the history and culture of the country to better understand the reasons they may have implemented things. An interview protocol of nine open-ended questions was created and used to determine which of the projects have had the greatest impact, the process for implementing them, what the barriers were and where the participants would like to see the future of education.

This chapter presents an analysis of study findings and related conclusions. Recommendations for further study are offered.

Restatement of Findings

Technology is an increasingly influential factor in education. More and more countries are using technology to increase access to educational opportunities that were not available prior to the Internet. This case study examined how New Zealand's Ministry

of Education has taken advantage of the Internet and these new technologies to reform education and provide access to a high quality education for all students.

The study identified five research questions to learn the process of how and to what extent e-learning has been implemented, to find the benefits and barriers of the implementation process, and to find out how New Zealanders plan to expand their offerings to change the future of education for the next generation.

When asked to what extent e-learning has been adopted in New Zealand's secondary schools, it was found that there were five main projects in place to support e-learning: ICTPD, VLN, TELA Program, the Correspondence School, and the TKI Website.

The ICTPD program has been around the longest, for over 11 years, and based on the data, has been one of the most effective programs. The program is based on the Communities of Practice (CoP) model, which is "A person's intentions to learn are engaged and the meaning of learning is configured through the process of becoming a full participant in a sociocultural practice" (Lave & Wenger, 1991, p.29). If you put people together with a common focus and give them the freedom to collaborate in order to learn, you have a community where newcomers and old-timers can share knowledge, experiences, identities, artifacts, and activities.

Based on Lave and Wenger's research, they have found this model of Communities of Practice, which the New Zealander's call clusters, to be much more effective than stand up and teach methods. The cluster model puts the learning in context

for the learners as they are now defining their own needs. In New Zealand, clusters are formed around specific regions or can be created to define a need and/or interests in the area of ICT.

New Zealand's Ministry of Education funds three years for a cluster in the ICTPD program. Clusters are formed by schools and/or groups of teachers who want to expand their professional ability of using ICT in the classroom. Combined with the teachers getting a laptop from the TELA program, teachers are well prepared to use technology in their teaching. Together, they explore topics and ideas and learn from one another and have access to the technology practice these new skills in their classrooms.

The Virtual Learning Network and Correspondence School are programs that offer distance learning for students in New Zealand. They began with the need to serve students living in the most remote areas of New Zealand, and the programs are now growing and offering courses to all students in New Zealand through Video Conferencing, the Internet and correspondence materials.

Changes in the New Zealand curriculum have added new requirements in foreign languages that could not otherwise be met by all schools without these two programs. Smaller, rural schools cannot afford to hire specialized teachers to teach one or two students. With the forming of the clusters, schools have come together using the technology to broker the offering of various courses to provide all students with access to the courses they need in order to graduate from the secondary school.

These students can now stay at home in their communities with their families and still take courses of interest to them and courses that will allow them to meet their educational needs to advance their education through the tertiary system or in the workforce.

Finally the TKI website was created by the Ministry of Education to provide digital content and resources to classroom and online teachers. This bilingual portal has grown over the years from a small educational search engine to a global community of users sharing educational resources with one another. The other programs provide professional development and technology for teachers and courses for students, while the TKI site completes the projects by sharing curriculum.

Through all of these projects, both students and teachers are given new opportunities to share knowledge. The Ministry of Education has not only provided the necessary technology for schools, but has created a model where teachers and schools can collaborate, learn from one another and share knowledge to extend learning for students.

The second research question asked how the projects were implemented across New Zealand and one common theme emerged. All of these projects came from a grassroots approach. Teachers developed their own professional development based on their needs; rural schools developed the Virtual Learning Network to fill their staffing and course offering needs; and the TKI website has grown from a small site of educational resources to a global community sharing their own resources.

Because the schools are autonomous and use the Ministry of Education as more of resource for guidance and support, they have more freedom to start up projects than schools in other countries may have; however, these projects have a long history of success and the participants in the study attribute that to this freedom of trusting the schools to do what is best for kids based on their specific mission and needs.

One key theme that was shared by several of the study participants was that four groups must be created and work together in balance to successfully implement and support e-learning programs. These groups should focus on: research and innovation, capability or professional development, online services, and infrastructure. If these four groups have not been established and are not all working together, participants of the study did not believe that e-learning would be sustainable in New Zealand.

The research and innovation group is focused on keeping up to-date-on what is happening in education both locally and around the world. They are listening to their schools and teachers needs and staying abreast of current trends and research from around the world.

The capability or professional development group assists teachers in developing their professional needs. This can be done in a variety of ways, but New Zealand has found that building Communities of Practice has worked best for them.

Next, the online services group is working with schools to develop online content and resources for the classroom, whether it is face-to-face, blended, or fully online. They also work with the schools to assist in selecting software tools that will allow them to

supplement their face-to-face class or deliver their entire course in an online environment.

Finally, the infrastructure group works with the wires and hardware to ensure schools are connected and can network with one another in order to enhance their professional collaboration and development and to deliver content to students.

These four areas must work together in sync. If any one of the groups falls out of sync, several situations could happen to limit the effectiveness of the online learning in schools. For example, if the infrastructure group wasn't doing their part, people would be restless because they wouldn't be able to apply the skills they had learned from the professional development group and would become frustrated, or a bunch of new software and online services could be implemented, but if there was no professional development built around them, they would just sit on the servers with nobody accessing them. So the participants of the study highly recommend using this model as it has worked well for them.

Research question three focused on finding what the benefits of implementing online learning have been for New Zealand. Several benefits were identified by the study participants including: ICTPD, the VLN, TELA Program, providing educational opportunities to all students, professional collaboration, and a pedagogical shift were identified by the interviewees.

The three programs identified as being positive as they led to the major benefits described. The Virtual Learning Network has provided new opportunities for students

that would not otherwise have been available. Rural schools were being threatened to be shut down because of low enrollments. Students were taking the bus for long distances or enrolling in boarding schools to have access to a full curriculum. With the schools forming clusters in the ICTPD program, this grew into professional collaborations, which led to the sharing of teachers and courses to provide more opportunities for the students in rural areas. This program is still growing and access may be extended to urban students and possibly the primary grades in the future.

The ICTPD program seems to have led to the creation of all of the other e-learning programs that have been described in this study, showcasing the power of Communities of Practice. Eleven years ago this program started from the Ministry of Education's first ICT Strategy. The original strategy "set out aspirations for developing the use of ICT in schools, and provided information on initiatives to help achieve the joining goals of building infrastructure and school capability" (New Zealand Ministry of Education, 2003, p.4).

A three-year study that assessed the program in its infancy found that more teachers were using ICT more often in the classroom, gained confidence in using the technology for teaching and the study found that clustering was a very successful model (New Zealand Ministry of Education, 2003). The success of this program led to the development of the TELA program.

The Ministry of Education had paid for each principal to have a laptop, but at the time, the teachers were given nothing, unless the school had purchased them, providing

very uneven access. Now that the teachers were learning how to use technology, they needed a way to implement it and the TELA (Teacher Laptop) program filled that need, allowing teachers to practice the new skills they learned in their professional development.

The final benefit that comes from all of these projects is that they have fostered professional collaboration on all levels of the New Zealand education system. The ICTPD clusters have brought teachers and schools together to identify shared goals and collaborate to reach them. The VLN brings schools together at a national level and both students and teachers can build new relationships that may have not been possible without the technology. Finally, the Te Kete Ipurangi (TKI) website has brought together educators to share resources with other educators from New Zealand and globally. Because New Zealand is so geographically isolated from the rest of the world, they have taken advantage of the technology to participate with the rest of the world in education, business, government and other sectors, creating new economic opportunities as well.

Research question four asked what barriers or obstacles did you encounter during the implementation process? Several barriers and obstacles including: infrastructure and tech support, professional development and a mindset change, and a lack of leadership, policy, funding, and research were identified by the interviewees.

The infrastructure has been one of the biggest barriers to implementing and expanding online learning opportunities to students. Because New Zealand is so geographically remote from other countries, access to high speed Internet has been a

challenge. The new government is addressing this barrier and investing up to $1.5 billion alongside private sector investments over the next ten years to:

- "Improving coverage of fast broadband services so that 97 percent of New Zealand households and enterprises are able to access broadband services of 5 Mbps or better.
- Ultra-fast broadband to 97 percent of New Zealand schools (serving 99.7 percent of New Zealand students)" (New Zealand Ministry of Economic Development, 2010).

This will help to grow and expand online learning offerings to students, teachers and administrators, and hopefully will remove this barrier.

Leadership has been identified by all of the interviewees as being key to the implementation and expansion of e-learning. Changes in leadership over the years have affected e-learning. Several projects have been cut because of central leadership in the Ministry of Education not understanding the importance of how they can reform education. There have been leaders who have understood the importance of and need for these programs, leading to the ICT strategies; however, if current leaders don't see how these programs are reforming education in New Zealand, their growth could stop.

This has led to the mindset of some of the population still not understanding the importance as well. Because these projects have been grassroots movements, the majority of the teachers, administrators, students, parents, and community are participating and see the value; however, there are still the naysayers who have not chosen to take advantage of

the ICTPD and TELA programs. There are still students and families waiting 6-8 weeks for packets of coursework to arrive in the mail to complete their coursework on their own or do not have access to a school and must be sent to a boarding school, because of the lack of access to technology or the mindset of the family is that computers should not be used for school. Expanding the professional development and access to all students and schools is a goal for the Ministry of Education, but is still years away.

The final question asked what does the Ministry of Education want to do more of in relationship to online learning in secondary schools? When interviewees were asked what they would like to see more of in terms of e-learning in the future, their answers fell into five themes: infrastructure, expanding access to educational opportunities for all students, research, professional development, and reforming education.

As described in the previous section, the implementation of the nation's broadband initiative was the one thing the majority of the interviewees were looking forward to. Access to high speed Internet is not available to the majority of the country right now and in those places that do have it, it is very expensive. Connecting 97% of the schools and communities to the Internet will help expand access to the resources described in this study to all of New Zealand.

The new infrastructure will also grow the professional development and VLN projects. The ICTPD program is currently being reformed. The Ministry of Education is updating the core principles that guide the professional development to match the goals of the new ICT Strategy, *Enabling the 21st Century Learner: An e-Learning Action Plan*

for Schools 2006-2010. The VLN is also updating its community portal to include more training and resources for the online teachers and the Correspondence School is digitizing its content and beginning to develop online courses rather than the paper-based courses currently being used in order to engage more students.

The interviewees also expressed interest in conducting more research in the area of online learning. The current research has shown that the students participating in the VLN are doing as well as those in face-to-face classrooms. Research as to why this is happening and how to make the coursework more engaging are topics they wish to explore in more depth.

Finally, some unintended outcomes were found during the interview process. Participants shared advice for others wanting to implement e-learning as well as their thoughts as to this program being transferable in terms of implementing e-learning in other countries in a process similar to New Zealand.

All but two of the participants believed New Zealand's model of implementing online learning could work in other countries. Their only concerns were to take into consideration the cultural differences when working with other countries. After meeting with other countries and even helping to implement a few of the projects in other countries, they have seen it work with modifications to meet their individual needs, which leads to the advice they gave of being open-minded and flexible.

Looking at the United States and the other countries highlighted in chapter two, New Zealand's grassroots approach may not work in a country like Singapore, where

there is a much more top down approach to implementation of projects and innovations in education, where it could work in countries like the United States and Canada where education is controlled locally and groups of teachers, leaders, and families could and are putting similar initiatives in place.

All of the participants suggested finding a visionary team of leaders to do the background research who have the connections within the schools to find open-minded administrators and teachers willing to try new things. Their success has happened because these projects were started to fulfill a need within the schools. The educators found value and saw the benefits of what they were learning and grew the programs through collaboration and expanding their communities. Without their buy-in, the programs never would have worked.

The final key piece to the implementation of e-learning in New Zealand was ensuring the four teams were assembled with visionary people that worked together. The research and innovation team is constantly creating relationships with other educators and leaders around the world to stay up to date on what is working in education. The capability group is working with the research and innovation team to provide new offerings and to keep the guiding principles of their successful program in alignment with the national strategy. The online services team is reviewing new software and resources to build and grow the TKI community as well as assist schools in purchasing and training teachers to use the new tools. Finally, the new government has seen the value in what the

e-learning team and schools are doing and are investing millions of dollars to update their infrastructure to expand these programs.

With these visionary people working together with the entire education system, they are not only implementing new opportunities for students, but they are on the path to reform education in order to educate students for the 21st century workforce to keep New Zealand competitive as one of the leading economies and education systems in the world.

Conclusions

Based on the data from the study, four conclusions were made about the current e-learning initiatives in New Zealand: (a) people will learn to use the tools and processes that meet their perceived needs; (b) Communities of Practice have contributed to the growth of e-learning; (c) countries develop what they need; and (d) everyone thinks that other countries are ahead of them.

When New Zealand started the ICTPD program ten years ago, they let the schools and teachers make it their own. Each cluster designed a program to meet their individual needs. With this ownership, they bought into the ideas they were learning about and created new programs to provide students with the best education possible. These clusters started in remote areas where there was a lack of teachers in specialty subjects. Older students in rural schools were not able to take classes to prepare them for continuing their education or entrance into the workforce. The administrators and teachers saw this need to expand their curriculum and invested in the technology and training and created policies and processes to support their students. Because they saw the need for e-learning,

they took the time to learn and invest in the technology and worked together as a professional community to share their resources.

To participate in the ICTPD program from the MOE, schools and/or groups of teachers have to form a cluster with similar goals and needs. Within these clusters are individuals who have various levels of expertise around the subject of ICT. Throughout the three years, it seems that communities of practice (CoP) are being formed in New Zealand. Individuals with a common interest, come together to share knowledge and artifacts and discuss and grow their practice. Each person within the community "correspondingly transform[s] into a practitioner, a newcomer becoming an old-timer, whose changing knowledge, skill, and discourse are part of a developing identity – in short, a member of a community of practice" (Lave & Wenger, 1991, p.122). Through these CoPs, e-learning has developed and grown across the country. Teachers, the practitioners, are collaborating to share curriculum resources, new pedagogical approaches, as well as developing policies and processes to ensure students are successful.

The schools CoP around ICT and e-learning in New Zealand works for their country. Schools are autonomous and can develop their own policies and practices with guidance and support from the Ministry. Teachers are very geographically isolated and technology has given them the opportunity to collaborate and share resources to improve access to a quality education for all students. Each country has various needs and reasons for implementing online learning as seen in chapter two. Singapore's lack of natural

resources has created a need for them to be the best in technology services. Turkey has developed e-learning because of the lack of teachers willing to teach in some of the dangerous cities throughout the country. Schools in the United States had a lack of teachers in remote locations and in specialty content areas creating a need for online learning. E-learning is providing a solution to meet a variety of needs. Each country that participated in the iNACOL survey and this study has a different need and has implemented e-learning to meet that need in a variety of ways, none of which has proven to be more successful than the other, but works for each individual country to meet its own needs.

Finally, after surveying several countries e-learning initiatives in 2006, several countries were seen as leaders in the field, with New Zealand being one of them. However, after visiting the New Zealand MOE, they do not see themselves as leaders in the field. Several countries, who were also found to be leaders in the field, such as Singapore, have come to visit and observe what is and has been done in New Zealand to expand their own programs. Although e-learning programs are being implemented successfully in different countries, a few countries stand out as leaders and the leadership in these countries do not think they are doing anything exciting to expand options for their students through e-learning.

Based on the findings in chapter two, there are a variety of ways that e-learning has been implemented, based on the educational structure of the country and the nation's leadership. New Zealand was chosen as a leader in the field because of the success and

growth they have had with their initiatives. Giving teachers ownership over their students' learning is something schools and countries strive to do, and it is happening across New Zealand. They have been given the power and freedom to teach their students in the methods that work best for each individual child, making them a leader in e-learning.

Recommendations for Future Research

This study is considered significant in that it is the first time, based on the review of the literature, that the full implementation of New Zealand's e-learning program has been studied in depth. The findings of this study can be used to help other countries to learn from New Zealand's experiences when implementing or expanding their e-learning offerings.

The findings from this study clearly show the passion of the employees of Ministry of Education's e-learning team, and the secondary school principals and teachers for expanding access to high quality educational opportunities for all students. The results also show that it has been a long process to get where New Zealand is in implementing online learning, with some things going well and some ideas having to be revisited in order to reach the capacity they have built within their schools.

The implication for secondary students in New Zealand will be their ability to continue to access a high quality education no matter where they live in order to continue their education to be lifelong learners and productive and upstanding citizens.

Students living in the rural areas of New Zealand and the Maori population have been at risk for completing and continuing their education in New Zealand until these new opportunities arose through e-learning.

Suggestions for future study include the following:

1. Expand the research sample to include students and parents. This would provide another perspective to add to the case study as this study focused mainly on the point of view of the Ministry of Education
2. Case studies of other countries who have implemented online and blended learning.
3. Looking at organizational cultures that foster innovation in online, blended and hybrid models.
4. Taking a more in depth look at the ICTPD program and other teacher preparation and professional development programs that support career-long development of teachers for online and blended learning.
5. Further study on leadership and management practices that support quality and innovation.

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APPENDIX A:
Pepperdine IRB Acceptance Letter

PEPPERDINE UNIVERSITY

Graduate & Professional Schools Institutional Review Board

January 6, 2010

Protocol #: E1009D02
Project Title: *A Case Study of E-Learning Initiatives in New Zealand's Secondary Schools*

Dear Ms. Powell:

Thank you for submitting the revisions requested by Pepperdine University's Graduate and Professional Schools IRB (GPS IRB) for your study, *A Case Study of E-Learning Initiatives in New Zealand's Secondary Schools*. The IRB has reviewed your revisions and found them acceptable. You may proceed with your study. The IRB has determined that the above entitled project meets the requirements for exemption under the federal regulations 45 CFR 46 - http://www.nihtraining.com/ohsrsite/guidelines/45cfr46.html that govern the protections of human subjects. Specifically, section 45 CFR 46.101(b) (2) states:

> (b) Unless otherwise required by Department or Agency heads, research activities in which the only involvement of human subjects will be in one or more of the following categories are exempt from this policy:
>
> **Category (2) of 45 CFR 46.101**, research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior, unless: a) Information obtained is recorded in such a manner that human subjects can be identified, directly or through identifiers linked to the subjects; and b) any disclosure of the human subjects' responses outside the research could reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, or reputation.

Your research must be conducted according to the proposal that was submitted to the IRB. If changes to the approved protocol occur, a revised protocol must be reviewed and approved by the IRB before implementation. For any proposed changes in your research protocol, please submit a **Request for Modification Form** to the GPS IRB. Because your study falls under exemption, there is no requirement for continuing IRB review of your project. Please be aware that changes to your protocol may prevent the research from qualifying for exemption from 45 CFR 46.101 and require submission of a new IRB application or other materials to the GPS IRB.

A goal of the IRB is to prevent negative occurrences during any research study. However, despite our best intent, unforeseen circumstances or events may arise during the research. If an unexpected situation or adverse event happens during your investigation, please notify the GPS IRB as soon as possible. We will ask for a complete explanation of the event and your response. Other actions also may be required depending on the nature of the event. Details regarding the timeframe in which adverse events must be reported to the GPS IRB and the appropriate form to be used to report this information can be found in the *Pepperdine University Protection of Human Participants in Research: Policies and Procedures Manual* (see link to "policy material" at http://www.pepperdine.edu/irb/graduate/).

Please refer to the protocol number denoted above in all further communication or correspondence related to this approval. Should you have additional questions, please contact me. On behalf of the GPS IRB, I wish you success in this scholarly pursuit.

6100 Center Drive, Los Angeles, California 90045 ▪ 310-568-5600

Sincerely,

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cc: Dr. Lee Kats, Associate Provost for Research & Assistant Dean of Research, Seaver College
Ms. Ann Kratz, Human Protections Administrator
Dr. Doug Leigh, Chair, Graduate and Professional Schools IRB
Ms. Jean Kang, Manager, Graduate and Professional Schools IRB
Dr. Jack McManus
Dr. Martine Jago
Ms. Christie Dailo

APPENDIX B:
Interview Protocol

Interview Guide for Ministry of Education, Secondary School Administrators, Teachers, and Parents of Secondary School Students of New Zealand

1. What has been your role in the implementation of e-Learning in New Zealand's secondary schools?
    a. Policy, Funding and Leadership
    b. Professional Development
    c. Infrastructure
    d. Curriculum and Assessment
    e. Student Services
    f. Research and Development
2. What is the nature and extent of e-learning in New Zealand's secondary schools?
    a. Policy, Funding and Leadership
    b. Professional Development
    c. Infrastructure
    d. Curriculum and Assessment
    e. Student Services
    f. Research and Development
3. What steps were taken for New Zealand's Ministry of Education to implement a system-wide online learning environment across the country?

a. Policy, Funding and Leadership

b. Professional Development

c. Infrastructure

d. Curriculum and Assessment

e. Research and Development

4. What areas of the implementation of online learning in New Zealand's secondary schools have had the greatest impact?

a. Policy, Funding and Leadership

b. Professional Development

c. Infrastructure

d. Curriculum and Assessment

e. Student Services

f. Research and Development

g. On Your Child's Learning

5. What problems/obstacles did you encounter and ideas did you abandon during the implementation of online learning in secondary schools?

a. Policy, Funding and Leadership

b. Professional Development

c. Infrastructure

d. Curriculum and Assessment

e. Student Services

f. Research and Development

g. Parents in the Home Environment

6. What are the unexpected benefits of implementing online learning in the country of New Zealand?

a. Parents

b. Teachers

c. Principals

d. MOE

7. What are your plans for the future of online learning in New Zealand's secondary schools?

a. Policy, Funding and Leadership

b. Professional Development

c. Infrastructure

d. Curriculum and Assessment

e. Student Services

f. Research and Development

8. Would the approach used here in New Zealand work well in other countries? Why or why not?

9. What advice would you give someone preparing an online initiative based on your experiences here in New Zealand?

APPENDIX C:
International Matrix

International K12 Online Learning Initiatives
Based on iNACOL 2006 Survey

Country	Overview of e-Learning	Current Initiatives	Extent of Adoption	Master Plan	Student Population	Content
Australia	*National Policy Statements *Bandwidth to schools *Education Network Australia *Career information and services *Online educational standards *Develop content *Manage national educational DNS service	*CAP RESEARCH MODULES *The "Collies" *Australian Flexible Learning Framework	*Very strong uptake in the VTE sector (80%) and estimated uptake in schools is approximately 30% within institutions. However, outside of institutions the statistics indicate a 73% uptake which could be argued to reflect non-institutional uptake for education and training.	*Annual report, which is not made public, is written for the Ministers of Education and Training by the Natl Dept for Ed., Science and Training	*Rural Students are largest pop. *Stronger uptake in urban schools and from middle and high income areas. *No gender differences or school size differences. *Blended learning is dominant.	*Developed by teachers with aid of consultants. * Modules are developed during workshops. *Contract private companies to develop online courses. *Training through coordination at national ICT agency *education.au limited.*
Canada	*e-Learning initiatives at MOE (provincial) and/or District (local) program. *All provinces have made some progress. *Discussions around the	*Ontario MOE providing a provincial LMS and LOR used for full online credit courses and credit recovery modules, not available for a blended approach. * There are 3 consortium groups	*E-Learning is in every province and most Boards. *In the Alliance, close to 4000 students taking full credit courses and about 1000 in blended delivery. *Across Ontario estimated	*No current national master plan for K12 e-Learning.	*Most students are seniors taking courses they need to complete their high school diploma or for university preparation. *There is a combination of rural and urban students, depending on the board *Most students	* Up until 2006 this was a local Board initiative except where Boards joined a consortium. *MOE online courses through

	collaboration of consortiums across borders. *Discussions around a national LOR. *Provincial consortiums lead by both provincial governments and organized at grassroots levels.	*Ontario Strategic Alliance for e-Learning. *15 Boards share resources, training, curriculum development, teachers and best practice ideas *French language Boards share resources and expertise.	25,000 students taking online courses.		use online learning independently, however a slow growth of these tools in a blended delivery model is growing.	their LMS – only available to teachers using MOE LMS for the delivery of full online courses. *Teachers within School Boards will continue to be the main drivers of curriculum development.
China	*Few people access online education due to the high costs and Internet conditions. *If population of those being educated rose 1%, almost 100 million new students could participate. *Online education will become a way to push the non-ideal Chinese Internet to make a profit. *Future of online learning in China is promising.	*In 2006, 67 pilot universities running online learning programs *From metropolitans to middle-sized cities, from developed eastern to central and western regions in China.	*Although there are increasing numbers of Internet learners, it still accounts for a low percentage of the total population of China. *The development of online learning is limited by the number of online learners *People below 22 years old account for 23%, 22-29 account for 50%, 30-39 account for 18%, and upwards of 40 account for 9%.	*2004 China Network Education Research Report *2006 China Network Education Industry Analysis and Investment Consulting Report	*Most students are from urban areas due to the wideband distributions and learning costs. *Limited courses and resources which have limited the enrollment in online education. *Majority of people who use online learning are male, ages 22-29.	*Government and universities like Tsinghua, Beijing Normal Universities, etc. as well as many experts are conducting research in this area.

Hong Kong	*Enable students to engage in empowering modes of learning *New IT in Education Strategy Policy Document *Designed e-learning platforms *learning activities for all primary and secondary schools *EMB will support research and evaluation on pedagogically appropriate e-learning platforms, provide teacher training, and to enhance courseware.	*IT in Education Section of the EMB works in three areas to promote e-learning in Hong Kong schools: funding for schools for LMS', funding for schools to purchase courseware/learning objects for LMS, and organization of prof. dev. to train teachers the theories and practices of implementing e-learning.	*E-Learning is used to provide learning support to students and to cater for the needs of individual differences. *E-Learning is unlikely to take over face-to-face teaching. *The use of Information Technology (with e-learning as one possible means) in enhancing student learning is practiced daily in schools.	*"Empowering Learning and Teaching with Information Technology" published by the Education and Manpower Bureau (EMB) in July 2004	*E-learning is not the main theme of instruction or method of providing education to students. *No school provides full e-learning courses. *Local teachers create additional learning activities online after school to strengthen face-to-face lessons. *Students complete online tasks, collaborate or get feedback from peers or teachers online.	*Teachers develop their own e-learning materials that best fit the needs of students in individual schools.

Iran	*Online education covered by both private sector and by govt. orgs. *MOE works in three main areas: created a few online courses which teach the software to produce electronic content, created intelligent schools where most content is either online or on CDs, and there is an attempt to produce a network among the schools. *Private sector, large number of companies working in e-Learning, which have online courses for high schools and give certificates which are approved by MOE.	*MOE does most projects *Many private schools offer it to attract students. *Several online activities have been created. *Want teachers to take online courses. *Quite a few teachers doing online projects in collaboration with other teachers throughout the world. *Examples are iEARN, ENO, robotics, natural disasters, and mathematics projects.	*As far as doing projects, several schools are familiar with it. *Carrying out curriculum, only a few do this and on a limited basis. *An estimated 20,000 students participate in online activities.	*K12: http://www.elearning.tehranedu.ir http://elearning.roshd.ir http://www.schoolnet.ir *Universities: http://home.elearning-iust.ir/ http://www.kntu.ac.ir/	*Mainly students in big cities are using this facility and also from large schools. *It is not independent and is always carried out with other forms of instruction. *Independent courses have been designed for first grade to high school by the private sector.	*Local and national governments, teachers and private companies are active in developing content, but the successful ones are private companies. *At the university level there is cooperation between Iran and other countries like Italy, Germany and the United Kingdom to develop content.
Kazakhstan	*Some larger states and private universities have started to provide e-Learning. *Current plan for high schools and universities is to provide University courses through the Internet to students.	*Karaganda State University provides e-Learning for students. *Each student gets a login and password to access their data and lectures on the web-site. *The best example of	*Percentage of students participating in online learning has not been collected, but the number is small. *Online learning has been adopted by a few, newer and	*No official report. *The master plan is to connect all the schools to the Internet. Make a local network around the country that will connect all of the	*Ages 13–19 who already have and know how to use computers at their homes, and know some software and Internet tools. *This is about 8% of	*State Universities develop online learning on their own with the help of the national government for high schools.

	*Elementary and secondary schools use the Internet to discuss and interact with others and to exchange their experiences and new ideas.	online learning is the iEARN network, which provides several projects in which some of the schools are taking part.	younger teachers who know how to use the computer and Internet, who know the English language, and who know how to implement collaborative projects in their curriculum.	schools. *Students should effectively and actively use internet for online education.	students in each class. *Such students are living in urban areas and attending large schools.	*Elementary and secondary school teachers within the school implement online learning. *Some initiatives of local govt. also help.
Nepal	*E-Learning has been an effective way of delivering classes in Nepal. *Most of the people from the area have Internet access and are benefiting from e-Learning. *iEARN Nepal organizes seminars to introduce the learning environment through the Internet, targeting school children and teachers.	*The govt and UNESCO have announced they will support the establishment of 205 community learning centers throughout the country for holistic development of education through non formal ways for all ages of people.	*The government wants to promote e-Learning for managing schools. *They are also looking into adult education to reduce the high number of illiterate citizens. *The government has created the "Right to Education 2015" act. They would like to use e-Learning to educate the citizens on conflict mgmt, peace keeping, and peace management.	*No current national master plan for K12 e-Learning.	*Nepal will target exceptional children, victims of war, orphans, and disabled students as the result of a long civil war of the country for e-Learning.	* Nepal is working with iEARN to develop content to meet its needs.
New Zealand	*No separate work stream or branch of	*The full list of projects and initiatives	*Online learning is only one facet	*Research reports on e-Learning in	*Correspondence school enrollments	* Local and national

	government dealing with online learning. *Plans for e-learning in NZ - three key documents in the schools sector: the action plan, the National Digital Strategy and ICT Strategic Framework, and the ICT Strategic Framework.	pertaining to e-Learning in school sectors are located at: http://www.minedu.govt.nz/index.cfm?layout=index&indexid=6919&indexparentid=1024. *Virtual Learning Network (VLN) is a nationally brokered service to support e-learning in particular video conference capable schools.	of the wider e-Learning picture. *It is not possible to give an estimate of the number of students participating in it and therefore the extent to which it is being adopted. *There are a significant and increasing number of schools offering courses and learning via the Internet and online media.	schools http://www.minedu.govt.nz/index.cfm?layout=index&indexid=6920&indexparentid=1024	cover remote students, or those accessing subjects not available at their local school. *Also students who have not had positive experiences at school. *Maori medium students access Maori speakers in different subject areas through video conferencing. *Blending online learning with face-to-face such as users of Study It.	governments, as well as teachers and private companies develop online content. *Government funds some programs – e.g. VLN, Studyit. *Others such as the Cantatech operate on a collaborative basis where all participating schools contributed and received courses.
Singapore	*Schools have the autonomy to decide how they want to implement the use of IT for teaching and learning, which includes online education. *An increasing number of schools have subscribed to learning management systems (LMS)	*Schools with an LMS offer online lessons to their students using either school subscribed content or school created content or both. *Lessons are conducted in the school computer labs in core subjects. In some schools, same	*About 75% of the schools do have e-learning systems, and the percentage is rising as the remaining schools plan to come on board. This works out to about 400, 000 students who have at one time or another engaged in e-	*Master plan on the use of ICT in education *MOE, LMS Profiling Survey Apr-May 2005 *Information Technology Standards Committee (ITSC) Survey in Sept-Oct 2005	*Singapore is mainly a densely-populated urbanized society, and the schools are usually large in numbers. *A typical school has a population of between 1300 and 1700 pupils. *The blended	*Private companies develop the LMS and content for schools which use the LMS and content on a subscription basis. *The Ed Tech

	from local vendors. A few have also developed their own system using the open source software, Moodle. *All secondary schools and junior colleges have an LMS. *Primary schools are also encouraged to have an LMS installed for teaching and learning.	content is accessed by students from their homes, students pay for their personal subscriptions to the content. *Several schools have adopted e-learning week, students stay at home working on lessons and assignments delivered through the e-learning platform. *"iSHARE" (Inter-Cluster Sharing of Resources) is an intranet framework that facilitates the sharing of teaching and learning digital resources among schools to support online learning programs.	learning activities. *The main focus of Singapore's IT Masterplans is to develop teachers' capability and capacity to seamlessly integrate ICT into the curriculum to bring about engaged learning for our students. *At present, the number of students involved in e-learning depends on the content provided by the content providers. In some schools, the LMS is often used by students to access lesson activities or assignments from home.		approach is often adopted, a mix of face-to-face instruction and online learning.	Division within the Ministry also produces digital resources for e-Learning for subject areas where there is market failure or of strategic importanc e to Singapore. *Digital content is produced either in-house by a Media Productio n Unit or in collaborati on with teachers and/or with industry or outsource d to industry. *Some schools develop their own digital resources.
Tanzani a	*Very few schools, colleges and even universities offer	*There is very minimal practice of online	*Specific schools are working to extend e-	*No current national master plan for e-	*For the very few that can afford doing this, they are	*Online learning is new in Tanzania

	online education. *Some lecturers at St. Augustine University participate in online discussions and linking topics and materials on the Internet. *iEARN is working in Tanzania to create a proposal for training teachers at a few schools.	education in Tanzania. *The country would like to work with iEARN to build a website for teachers to post comments, read others comments, and to discuss topics.	Learning information to neighboring schools, to teachers, and students. *Tanzania needs online education, as there are very few resources such as books in public libraries and the current resources are not adequate.	Learning but will be creating one with focus on reporting, the system, monitoring, and evaluation.	from the urban centers where there is electricity. *In rural areas it very difficult to access because there is no electricity and the use of the Internet and computer is very rare.	and the schools that are interested are developin g their own online content.
Turkey	*Started in 1995 by the Turkish Education Foundation and the ERT, European Round Table of Europe. *It first began in the most remote areas of Turkey in 40 rooms provided by local governments. These "learning stations were built with computers and CDs, and the Internet, but are lacking software. There are 100+ stations in the most remote areas, where teachers cannot be sent due to terrorism. These stations serve 600,000 children and adults. *Government provides all computers (1:20	*The Turkish Education Volunteers Foundation's Learning Stations and Learning Parks since 1995 now educate 600,000 children. *MOE grades 4-8 deliver Turkish, Math, Science, Social online courses. *Almost 50 private companies, train their employees, agents and service companies online. *"Online Big Project" was started by NGOs for grades 1-8. *Interactive software and simulations were developed	*Currently, elementary and secondary schools are servicing 200,000 students online and in two years hope to have 12,000,000 students online. *High schools and vocational schools are currently educating 10,000 students and hope to raise the number to 3,000,000 in 5 years. *A pilot run started in September for 200,000 students in selected areas. In 2-3 years it will be used by 11 million	*No current national plan for K12 e-Learning.	*Students in the eastern Anatolia, which consists of very poor villages, are the students accessing online learning. They have access to computers and ambitions to learn unlike children in the big cities.	*5-6 private companies develop the big projects. *Some teachers develop some courses. *One private high school with 10 computer experts develops their programs themselve s. *Would like to develop some internatio nal courses with major software

	computer student ration) and broadband Internet to all 40,000 schools.	by a private company with 100 teachers and experts for grades 4-8 in several subjects.	elementary and secondary school students. There are 600,000 teachers who will be trained at the same time. *Courses will be revised every year according to world's development. All of this is financed by private business in Turkey.			and Internet companies and provide it for free to all world children.
United Kingdom	*Relatively widespread in the university sector, much lesson common in the school sector			*Harnessing Technology: Transforming learning and children's services		*Government, institutions and faculty develop online content.
United States	*Online learning is done at the state level; leaders of each state approve state, district, and school-wide e-learning programs. 24 states have state sponsored online schools and the majority of the other states are using e-learning in some form. *E-Learning programs have been created in several forms, such as: comprehensive	*Michigan has taken the lead of requiring all students to successfully complete an online course to meet the requirements of earning a high school diploma, and other states are working on similar initiatives. *Policy, online course standards, and content repositories are the current focus of K12	*Online course enrollments in K-12 virtual schools have grown by more than 30% each year for the past three years with over 600,000 total enrollments in 2005. *24 states have government sponsored schools and several school districts hundreds of school districts offer virtual	*Keeping Pace With K-12 Online Learning: A Review of State Level Policy and Practice	*Students take online courses for a variety of reasons such as: access to courses that are not available in their school, access to courses that are hard to staff, to earn credit, they physically cannot attend a school, they need to work, want to graduate early, want to	*Content is developed by corporate vendors, instructional designers, and content expert teachers *Digital Content can be purchased, leased, and developed within schools.

	schools, part-time programs, public, private, and charter schools, labs of students in brick and mortar schools taking online courses during the school day. *NACOL was established to serve as a resource to K12 virtual schools.	online learning in the U.S.	schools/programs as reported in the "2005 Keeping Pace With K-12 Online Learning" report.		work at their own pace, need to travel frequently, or they are bored in their face-to-face classrooms. *Full-time, part-time, and blended learning models are available to students.	*Several states, individual districts and schools have created online course development standards. *Courses are aligned to national, state, and district standards for quality control in the majority of online programs.

Country	Funding	Teacher Training	Standards	Obstacles	Approaches & Trends	Quality
Australia	*Funding is provided almost solely by National and State Governments.	*Poor and patchy in Australia. *Each State has a program for training but limited budgets. *Universities are responsible for teacher education and have not made ICT a major focus. *National professional associations like the	*Schools use a mixture of standards depending on the specific need and suitability of standards including: IMS, Dublin Core, EdNA metadata *The Learning Federation standards *SIFA and SCORM	*Bandwidth and Internet speed, teacher pre-service education and professional development, "fear of the unknown", an understanding and proficiency of the uses of ICT as a priority at senior governmental levels, and	*Provision of high quality online national services such as EdNA, myfuture, flexible learning, content development from the national ICT agency. *Provision of infrastructure in education by the States	*Exemplary forms of online learning are easily discoverable through the news services provided by EdNA *Flexible Learning *Knowledge Tree *Leading Practice

		Australian Council for Computers in Education (ACCE)		lack of national policy and leadership.	and improvements in broadband for education.	
Canada	*Costs are assumed by the School Boards *No provincial funding is provided which is a barrier for expansion *School Boards are taking money from other programs to support eLearning.	*Training is provided on the use of the tools by the Ministry and all other training is led by the Board *The Alliance Consortium trains teachers on online pedagogy and best practices through two conferences per year.	*No national standards. *Each province has curriculum standards but no online course standards or expectations/guidelines developed. *Alliance Consortium has developed some standards and developed a quality assurance process.	*Funding, government support, leadership, and direction are obstacles for e-Learning in Canada.	*Consortiums and partnerships are key to the development and survival of e-Learning *Ontario Strategic Alliance for eLearning, brought together district school boards to collaboratively develop and deliver courses and modules, train teachers, perform quality assurance and increase learning opportunities	*This is limited to each School Board unless they are part of a consortium and have identified some type of quality assurance process.
China	*In the urban area, if students study by Internet, they must pay the fees themselves, except in special circumstance e.g. if they live in genteel poverty, then the government or schools can reduce their fees or they can apply for a scholarship. *In rural areas, the government	*Most teachers are not well trained in use of online learning resources for their students. *Because online learning is not very popular and the development of online learning is only in its initial stage in China, most of us treat it as an assistant learning way	*Standards can be found at: www.vschool.net.cn/elr/ziyuan/zy0010.htm	*Online education is in its primary phase. Lack of qualified certifications. *Traditional education system has been developed quite well, so it poses a tough task for online education. *Better program	*Due to the large demands from the market, the companies and organizations which provide online educational service products will operate very well *Currently, it is a social	*The quality identification is managed by Ministry of Education of the People's Republic of China.

	will aid the students to go to school because online learning is free from any time and place.	due to the poor service qualities, high prices, and single courses.		design, the quality, management, standards, fees, virtual campus culture, etc. *Overall Internet technology levels are poor. Not enough wideband support, multimedia courses can't be delivered and the online education is not worth it yet. *Quality of teaching software in the online universities is poor, there is no live teaching.	practical activity. The emerging of this new market contains giant business opportunities, which will be of benefit to educational institutions, investors, and governments. *Online education also has a significant economic meaning. In the context of not enough educational resources, the development of online education is the most effective and practical choice for improving China's education.	
Hong Kong	*All public sector schools are funded by the government. E-Learning provided by schools to students, is funded by public money indirectly *Students are not required to pay extra for taking any e-learning course or using e-learning	*Professional development programs on training school teachers to apply e-learning in schools and using web resources in the forms of refresher training courses and in-service courses are regularly conducted to	*The EMB has not set any standard on developing and distributing online education in schools. *Two major brands of e-learning platforms are used by local schools and teachers to	*All schools are equipped with adequate computer equipment and broadband Internet access. *Teachers and students have good IT skills, and most of them are technology	*Most effective approach to e-learning schools is using a blended model of learning *The weightings between the face-to-face session and the online session could	*No mechanism to measure the quality of e-learning has been created. However, sharing sessions are regularly conducted with guest

	materials offered by their schools.	keep teachers abreast of the latest development of e-learning in local schools and in other countries.	create their online courses/learning activities *Some standards exist in the online materials developed by local schools and in their delivery.	savvy, and are willing to accept new modes of teaching and learning. *The already heavy workload of teachers is one possible obstacle for e-learning to spread in schools. *Limited amount of online resources available in the form of learning objects suitable for use by teachers to compile their own e-learning courseware.	be regulated depending on the subject that is taught. *E-Learning will continue to play a supportive role to complement class teaching. In the near future, face-to-face teaching will continue to take precedence in local primary and secondary education.	speakers from local schools and tertiary institutions are invited to present their personal experiences on how e-learning could be effectively used in different aspects to enhance learning and teaching in schools.
Iran	*The courses developed by the government are free for students as the government pays for it. *Courses developed by the private sector are more expensive and students pay for them.	*During the last five years there has been an attempt to familiarize teachers with developing electronic content and online courses. *A lot of training courses were carried out throughout the country and now teachers are familiar with computers and Internet.	*There have been great attempts in last two years to develop standards, but they have not yet been published.	*The public sector is weak and the private sector is too expensive. *Computers are still new in many parts of the country and there is a problem in integrating technology in small cities, and many schools do not have enough funds to upgrade	*The most promising approach is through private schools and universities. *The immediate need is to create courses for teachers on how to develop online courses. *The production produces enough	*To measure quality you have to attend the course and at the end you can assess it. * There are some examples in the official site for public sector. But they

				their computers. *People are scared of the Internet due to the lack of enough filtering and the vast number of unethical sites.	initiative for students carrying out projects. *Any expensive courses would fail as the culture of paying for online courses is not yet developed.	are not full online learning and the quality is also low.
Kazakhstan	*Online learning is paid for by governmental grants and student tuition. *Some foreign foundations fund online education initiatives by providing web-sites, web-spaces and Internet tools.	*High school and University teachers are trained at the University. Most of them have rooms for teachers that equipped with high-end computers and the Internet to provide online learning. *K12 teachers are poorly trained. Most do not know how to use the Internet and computer, but Computer Science teachers help with some training. Only a few teachers throughout the country use online learning resources with students.	*There are no emerging standards in Kazakhstan for developing and distributing online education. *Teachers use information and freeware software from the Internet – in most cases they don't want to pay for it, but want to use it for free. In most cases they are unsure of the liability/legality/truth of the information.	*Teachers have poor knowledge on how to use the computer, Internet, and take part in collaborative projects. *Students have very little knowledge on how to use the computer for online learning *High prices for Internet connections *Little motivation from the side of teachers and students both because of poor understanding.	*High Schools can study online using case-studies or syllabi from the Internet to interact with their teachers online *Trends: to use Internet for distance learning. *Elementary and secondary schools, teachers can interact with each other's, can represent classes being moderators in online forums and discussing boards. *Students can also take part in online conquests (on different subjects).	*It's hard to identify the quality, because students have to come to the University and pass the examination. *Quality is measured on the amount of time it should take a student should to complete specific tasks. *At this point, distance education is only a tool that helps teachers

						assists other teachers and students to learn and study on their own. *In the secondary and elementary schools online education usually integrated in the curriculum.
Nepal	*The government has funded teachers to take online courses through iEARN.	*The schools are practicing teacher centered learning using a hard punishment system which dates back many centuries. They are now researching how e-Learning can help them implement a student-centered learning environment to remove the punishment system.	*There are currently no standards for online learning.	*The majority of parents are illiterate which has caused a drop in enrollment of students and students dropping out of school are major problems.		
New Zealand	*Generally schools use their existing operational funding to provide online learning. *There is	*Virtual learning Network has some specific training to assist teacher professional development.	*NZ is participating in discussions to 'adopt or adapt' international standards through its	*Uptake of broadband, hardware/ software costs, technical issues and support,	*Virtual Learning Network at *We do not have a dedicated approach to online	*Online courses can be assessed against external examination/assess

	specific funding available for this. This funding is generally for startup projects/initiatives or to pilot new projects/initiatives.		IMS membership and its participation in the SCORM standards. *As part of the work being undertaken under the auspices of the ICT Strategic Framework.	teacher professional readiness, policy issues such as the lack of a resourcing-framework that can respond to the online classroom. *Issues identified in the e-learning action plan for schools	learning as it is considered more widely in the context of e-learning.	ment results * The 2004 report from Otago University in the main Video Conferencing Schools cluster (OtagoNet). * Evaluations available for the Digital Opportunities projects or Digiops. Digiops are a series of pilot initiatives around e-learning in schools
Singapore	*Schools are provided with an IT Grant by the MOE based on pupil enrollment. The IT Grant funds IT equipment, software and services. *Since 2003, the IT Grant has been devolved to schools. Gives schools the	*Teachers are trained on the use of IT for teaching and learning. *Schools can organize training for their teachers on the use of e-learning resources. *MOE has an online learning website	*Information Technology Standards Committee (ITSC), an industry partnership supported by SPRING Singapore and Infocomm Development Authority of Singapore (IDA) that has	*Cost of subscription for an e-learning system is a major consideration, and some schools are looking at ways to ensure there is value in the fund spent. *MOE is also	*IDA is leading a national effort to formulate and develop 'iN2015', a 10-year masterplan to grow the infocomm sector and to use infocomm technologies	*Online learning is tied closely to the development of quality digital resources for education. *Development of common

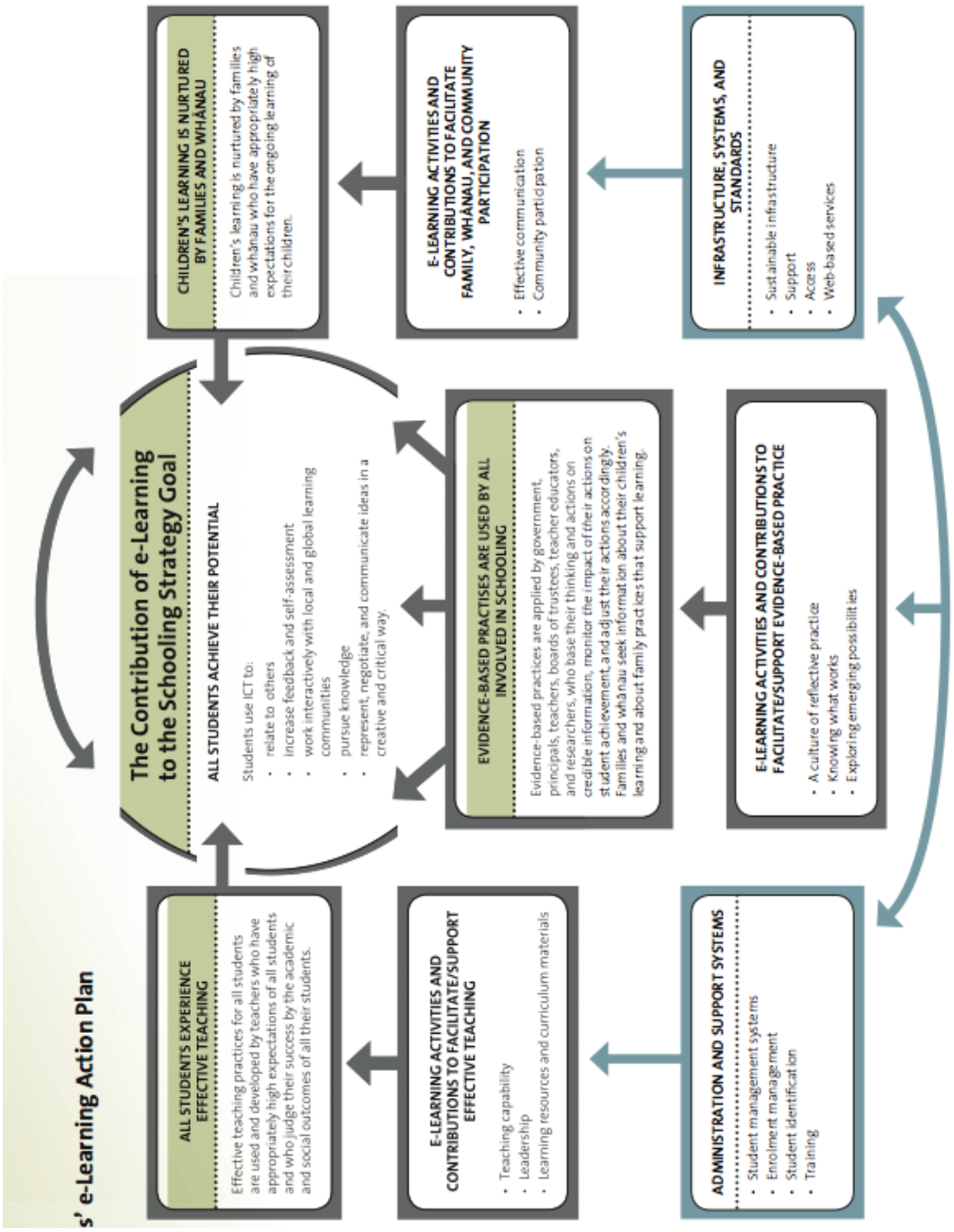
	autonomy and flexibility to plan their own IT programs to meet their unique school needs and to embark on IT initiatives, such as online learning and customized learning management systems. *Pupils may also pay for part of the cost using their Edusave Grant	"VITAL" for the professional development of teachers *Civil Service College also provides opportunities for teachers to learn online should they choose to do so	developed a Specification for eLearning Framework. *IDA is currently working together with ITSC to develop a metadata standard, Content Exchange Metadata Standards (CEMS) for the Education Sector, e.g. Metadata Standards, and Taxonomy Standards.	looking at ways to provide support to needy students so they have access to a PC bundled with Internet access *A significant number of students particularly in the primary schools (grade 1 to 6) still do not own a computer or have Internet access at home. *As pedagogy and design involving e-learning are still evolving, teachers' capability to use e-learning creatively and innovatively is still an issue.	to build a well-connected society. *Online learning is increasingly adopted by schools as part of their learning process. Project work and the shift to a more learner-centered approach have encouraged independent learning among students. *Using Open Source Software based LMS that have been designed and developed based on sound pedagogical approaches, e.g. *Develop learning content in terms of learning objects and storing them in a repository. *Using wikis, blogs, and photo blogs to aid in student's	e-learning standards so that it facilitates inter-operability in the exchange of content and that it meets a common 'taxonomy standards'. *Currently looking into a framework for the development of digital content, including e-learning resources. *MOE has a website of digital teaching and learning resources to ensure that resources are pedagogically sound and easily available to teachers. *Schools have set up a platform (iSHARE)

					reflections of their learning. *Using PDAs to complement online learning *Using information mapping to handle information glut *Incorporating Portal-like interface to LMSs. *Greater use of reflection and online journals by teachers and students to chart progress in online learning. A movement towards open content - e.g. Wikipedia	, a project designed to increase sharing and collaboration among schools, within and across clusters. *Experimentation with IT tools e.g. Tablet PCs have also been promoted "mobile learning". * Schools have also ensured that the LMS they subscribe to meet minimum requirements so that the setting facilitates online learning *Require vendors to design learning materials that are pedagogically sound and relevant to the curriculum standards

						and requirements. Vendors are also required to make continuous improvements suggested by the schools that purchase or subscribe to the LMS.
Tanzania	*Funds for this initiative are an issue. *There is a need for a proposal for funding this very important project for our country.	*Teachers are not trained in the use of online learning resources. *Volunteers show other teachers and students the Internet. They can manage a link to their school and others school for communication and contacts.	*There are currently no standards for K12 online learning.	*Many schools do not have computers and Internet *Very few teachers have computer literacy skills *Educators do not see this as an important aspect in education *Economy and social development *Not known by those with authority	*Once the program is well known and introduced, it will be the right time to give details and more approaches will be applied in making online education an important tool.	*No current information is available.
Turkey	*Funds for elementary and secondary online education will be provided by private businessmen *The government had	*The software is prepared such that teachers can understand it very easily. *Because of this, there is no need for teacher training. In	*There are currently no standards for K12 online learning.	*People are scared and do not understand the value of e-Learning. *Private companies will solve the	*Government intentions are good. But they are bound by formalities. *Private companies are eager to	*This requires further research. *Existing teachers are helping us.

	intended to do so but formalities have forbidden it. *University level, it will be funded by students *Vocational ED, the government and Chamber of Commerce and Industry will fund it	spite of this we created a two week teacher training in every region by computer and manuals at the donor's cost.		problems economically. *People think that they can get a good degree online and everybody will want to hire them.	make money with an online University.	*Once we understand how students learn and comprehend then we can do it online.
United States	*E-Learning is funded in a variety of models. Some examples are: state funding based on each student or completion rates, Grants, Student and/or School Tuition, Consortiums, and Scholarships from outside organizations.	*Several virtual schools have developed their own training programs for teachers. *Companies sell training on the use of their course management systems and other software. *Training is also provided at regional and national conferences.	*There are currently no national standards for the development and distribution of K12 online learning. *Each state has curriculum standards but currently no online course standards or expectations/guidelines have been developed at this time.	*Funding and national support of online learning. *Finding qualified teachers with content knowledge, technology skills, and the ability to transfer their teaching skills into the online world are difficult to find and retain.	*NACOL has brought together training, resources, and support for practitioners and leaders of K-12 online programs in the United States. *Individual schools and states are working together to form regional and local consortiums to share best practices and resources.	*Individual states, companies, and schools identify and measure quality within their online programs. *Content is usually aligned to national, state, and/or district standards. *Teachers are highly qualified in their content areas and are evaluated on local standards.

APPENDIX D:
Schools' e-Learning Action Plan



Source: New Zealand Ministry of Education, 2006.

APPENDIX E:
Validation of Data Letter

April 18, 2010

Dear Dr. Sam Sakai-Miller,

I am completing my doctoral dissertation for Pepperdine University. For this "Case Study of e-Learning in Secondary Schools in New Zealand," I traveled to New Zealand to interview officials from the Ministry of Education, secondary school administrators and teachers.

As part of the dissertation process, I need the assistance of a professional colleague to review and validate my coding process.

I have attached my research questions and all 19 of my interview transcriptions.

Here is what I did:

I took my research questions, which are attached, and used the highlighting tool to highlight the information in the interviews that was helpful in answering each corresponding question. The Research Question document has the specific colors that apply to the transcriptions.
Here is your task:

Please review each interview and add a + or – next to each highlighted area (you may use the comment tools in Word) to let me know if you agree or disagree that the highlighted information applies to the highlighted question. If, in your opinion, the highlighted response does not apply to the specific research question, please assign a – sign and a comment as to why it does not apply.

Thank you for your help in validating my data. I really appreciate your help with this task. Please feel free to contact me if you have any questions.

Sincerely,

Allison Powell