Summary Report in relation to the Virtual Learning Network

Primary and Secondary e-Learning: Examining the Process of Achieving Maturity

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Preface

The growth of virtual learning in New Zealand has been developing at "grass roots" level for over a decade now, establishing itself as a recognized form of education provision for a growing number of students. The development of the Virtual Learning Network (VLN) and the Virtual Learning Network Community (VLN-C) are testament to the emerging strength of this movement in terms of human and system capability and capacity. Ministry of Education support for this initiative has been provided in a number of ways, including the development of the *LCO Handbook*, but there remains a need for further coordination and support – particularly in the policy area.

The Distance Education Association of New Zealand (DEANZ) identified the need for research that provides a better understanding of what is happening in these clusters of the VLN across New Zealand, and have been very pleased to host Dr. Michael Barbour during his ten week sabbatical visit to New Zealand to undertake this research on their behalf. DEANZ is grateful for funding support received from the Ministry of Education, with additional contributions from CORE Education and the University of Canterbury e-Learning Lab.

As a researcher, Michael brings a considerable wealth of knowledge and experience in the field of virtual schooling from his work in North America, and this has proven invaluable as he has applied himself to researching the context of the New Zealand Virtual Learning Network.

We are grateful to the many people throughout New Zealand who willingly shared their time and experiences to provide the rich pool of data from which this report has been crafted. We are especially grateful to those who hosted Michael on his visits around the country, without this support the project wouldn't have been possible. We would also thank Donna Morrow as acting chair of Core Education's ethics committee.

Niki Davis, President of DEANZ & Director of University of Canterbury e-Learning Lab

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Acknowledgements

I would like to thank the ePrincipals, Principals, eTeachers, eDeans, Coordinators, Facilitators and Students from the various e-learning clusters that I visited during my time in New Zealand. These clusters included FarNet, CantaNet, WestNet, WeLCom, TaraNet, VLN Primary, OtagoNet, Greater Christchurch Schools Network, and the Wellington Loop. Special thanks to all of those who welcomed me and hosted me as I traveled throughout the country to visit each of these current and emerging clusters. I would also like to thank the Ministry of Education for providing the research contract that allowed for the work to occur, along with the Distance Education Association of New Zealand and its executive as the holders of that contract.

It would be remiss if I did not mention the those leaders of the Haka Tells a Story and ELLINZ projects, along with the administration of the Southern Regional Health School who gave their time. While not the focus of the research project described in this report, these conversations were very helpful in framing my overall understanding of the larger landscape of primary and secondary online learning in New Zealand.

Finally, I would like to thank Derek Wenmoth of CORE Education. The people you connected me with, the travel arrangements you made, and the provision of accommodations from community to community were all greatly appreciated.

Michael Barbour

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Executive Summary

This report describes a research study into the development of virtual learning in New Zealand, specifically the obstacles that e-learning clusters of schools face or have faced in their journey to sustainability and maturity through the lens of the Learning Communities Online Handbook. The project has collected and produced 14 case studies and digital stories to illustrate the matrix that describes the process that clusters of schools progress through as they evolve organizational structures and procedures to support and enhance the education of students within and beyond their cluster of schools. A total of 14 illustrations for the Matrix of the *Learning Communities Online Handbook* have been produced: six case studies (with a careful selection of transcriptions, video, documents, and/or other materials) four digital stories (video clips selected from an interview); plus an addition four digital stories recorded by Michael Barbour. In addition synthesis has been presented in the form of a webinar with a recording that remains available through the DEANZ web site (http://www.deanz.org).

The project also sought to answer the following research questions:

What common barriers do e-learning clusters face in their development towards maturity and sustainability? And, how have mature and sustainable clusters overcome those barriers?

What are some examples of how networked schools are emerging in the New Zealand context?

Using a variety of data collection methods, the researchers identified three common barriers, including a lack of a coherent vision, difficulty in securing the necessary funding and resources (particularly concerning the role of the ePrincipal), and a lack of collaboration and cooperation within clusters and between clusters.

In addition, there were several examples of ways in which the e-learning clusters have acted as a change agent to reform the way in which classroom instruction is designed and delivered, along with how schools are organised. There were many instances where the act of teaching in the virtual learning environment changed that teachers' classroom pedagogy, and in some instances the classroom teaching of other teachers at their school. There were other examples where the strategies that had evolved to connect different schools together for the purposes of distance education were being applied within the school environment to allow students to enroll in courses regardless of when the course was being "taught" by the teacher. At a structure level, there were some schools that had transformed the role of the school-based teacher from a subject matter specialist responsible for teaching a course to generalist responsible for facilitating students' learning of courses being taught by virtual teachers. Finally, there was at least one example of a school that was re-considering the physical learning space to accommodate student learning in a twenty-first century networked school.

Based on these findings, it is recommended that individual e-learning clusters develop specific strategies to encourage greater collaboration between clusters and work towards greater consistency between their activities, including professional and organizational development and also of the approaches to virtual learning. Second, the Ministry of Education continue to provide and expand synchronous and asynchronous virtual learning tools the e-learning clusters are able to use free of charge. Third, the VLN lead the creation of a central repository of asynchronous course content that all e-learning clusters and any school in New Zealand could adopt and adapt. Fourth, the Ministry of Education explore providing some support for the administration and coordination of e-learning based on larger geographic regions. Finally, virtual learning stakeholders in New Zealand consider supporting national research to examine the activity,

scope, participation, administration, management, and success of all of the different distance

education providers for the schools sector.

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Introduction

The purpose of this research was to study the development of primary and secondary online learning or virtual schooling in New Zealand, specifically how the Learning Communities Online (LCO) Handbook was used in that development. The project activities were guided by a desire to understand the common barriers that e-learning clusters faced in their development towards maturity and sustainability, along with how mature and sustainable clusters overcome those barriers. There was also an interest in identifying examples of how networked schools are emerging in the New Zealand context through the activities of the e-learning clusters.

One of the difficulties with research of this nature is the terminology. For example, in this first paragraph the terms online learning, virtual schooling and e-learning have all been used to refer to the same system of education. The Ministry of Education (2006) defined e-learning as "learning and teaching that is facilitated by or supported through the smart use of information and communication technologies" (p. 2). The reality of the New Zealand context is that many of the e-learning clusters that exist today were established through Ministry of Education funding for e-learning projects that may or may not have included an element of online or virtual learning. For the purposes of this report, the term e-learning is used in line with the Ministry's definition and the term virtual learning to refer to the provision of "courses through distance learning methods that include Internet-based delivery" (Clark, 2000, p. i). Finally, in North America primary and secondary online learning is often referred to as virtual schooling. When using North American literature the use of the term virtual schooling (i.e., virtual schooling is used synonymously with primary and secondary online learning) is maintained.

While the use of distance education at the primary and secondary levels began in New Zealand around 1922 with the introduction of the Correspondence School, the use of virtual

learning and the e-learning clusters began with the creation of the Canterbury Area Schools' Association Technology (CASAtech) project in 1993 (Wenmoth, 1996). As the CASAtech project became the Canterbury Technology Schools Project in 1996, and the introduction of the OtagoNet e-learning cluster in 2002 with the vision "to create a broadband [network] linking the Otago Secondary and Area Schools, to strengthen existing relationships and collaboration of these rural and geographically dispersed schools." (Pullar & Brennan, 2008), the roots of the Virtual Learning Network (VLN) began. In 2003 the VLN was officially established as a collaboration between the Ministry of Education and the various clusters that had been independently developing throughout the country. The primary focus of the VLN was to provide a brokerage service for the sharing of courses and programmes between clusters.

Through successive information communications and technology strategies implemented by various ministries, the physical infrastructure and human expertise was developed to allow the VLN to eventually grow to 18 geographic e-learning clusters providing virtual learning (Dewstow & Wright, 2005; Powell & Barbour, 2011; Roberts, 2010; Wright, 2010). Parkes, Zaka and Davis (2011) even describe the development of a super cluster that has come together to explore the potential of blended learning in the CantaNet and WestNet clusters (i.e., the Southern Central Divide ICTPD cluster).

In 2004, with support from the Ministry of Education, the initial version of a handbook to assist schools in forming virtual learning clusters was published. Entitled the *LCO Handbook*, this publication contained a matrix to guide development through the phases from initial conception to implementation. During 2010 the *LCO handbook* has been extensively revised, with an additional dimension added to the matrix addressing issues of sustainability and

maturity. This handbook was released in final version for use by schools and clusters in early 2011.

The report itself is divided into six sections. Following this introduction, the methodology used and changes that were required from the initial planning of this study are described. The findings follow in four sections beginning with an overview of the illustrative materials produced for the *LCO Handbook*. A discussion of three common barriers that existing and emerging e-learning clusters have or are likely to face in their development is followed by an exploration of four instances of emerging networked schools within the existing e-learning clusters. Next the *LCO Handbook* matrix is examined – in particular the Maturity Sustainability column. Finally, recommendations are made for a range of audiences including individual e-learning clusters and the Ministry of Education for the future development of virtual learning, along with suggestions for future research. While the focus of this research project was the virtual learning provided by the e-learning clusters, in making recommendations for the future of virtual learning in New Zealand – along with potential future research – it is important to include other bodies that provide distance learning opportunity (e.g., Te Kura/The Correspondence School, the health schools, tertiary institutions, etc.).

Methodology

The original purpose of this research study was to capture, in a range of ways, information that would contribute to the knowledge base about the development of virtual learning in New Zealand, in particular, how the LCO Handbook was being used to assist and inform this development.1 From this general purpose, two specific goals were identified:

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[1] As outlined in the contract between the Distance Education Association of New Zealand and the Ministry of Education.

(1) provide understandings of how schools involved are collaborating, and the impact and contribution of the LCO Handbook to their development and success; and
(2) to capture a series of case studies to help illustrate aspects of the LCO Handbook guidelines, and to provide examples of effective practice.

Based on these goals, one primary and two secondary research questions were identified:

P1. How are networked schools emerging in the New Zealand context?
S1. What do people pick up from the matrix in the LCO Handbook?
S2. What do they do with it?

Given the exploratory nature of the proposed research study, a single case study with multiple embedded units of analysis was selected as an appropriate methodology (Yin, 2003). In this model, the Virtual Learning Network (VLN) was the case, with each of the current and emerging clusters a unit of analysis within that case.

The proposed data collection methods included an online survey that would be administered to the leadership of the current and emerging VLN e-learning clusters to obtain an initial understanding of the extent the LCO Handbook was being used, and if there were any clusters that could be identified as particularly high users of its sustainability and maturity matrix. Following this initial survey, a researcher was to conduct site visits with a selection of clusters to perform semi-structured or unstructured interviews with current and former ePrincipals, eTeachers, eDeans/Site Facilitators/Local Coordinators, other member school personnel, and students. These interviews were to be recorded in audio, and in some instances video format, to allow for later transcription for research purposes and, in the case of video, the creation of digital stories and case studies to be included in the LCO Handbook's online resource. In addition to the interviews, the proposal also called for observation of video conferencing classes and tutorials, along with students working during their scheduled asynchronous virtual learning time. Finally, documents, images and other physical artifacts from the individual schools and clusters were also to be collected.

While this was the original proposal for this study, several events occurred that caused a revisioning of this initial plan. The first event was the 22 February earthquake. The online survey was to have been created late in February and deployed with the VLN leadership during the first two weeks of March. As the President and Vice-President of the Distance Education Association of New Zealand were based in Christchurch, the decision was made to exclude this method of data collection. Because the purpose of the survey was to identify those clusters that were using the LCO Handbook, the decision was made to conduct the site visits with some of the longer existing clusters – with differences in vision taken into consideration in the selection. Following the initial site visit, it became apparent to the researchers that while the leadership of the cluster may use the LCO Handbook, many of the leaders in the member schools were not even aware of its existence.

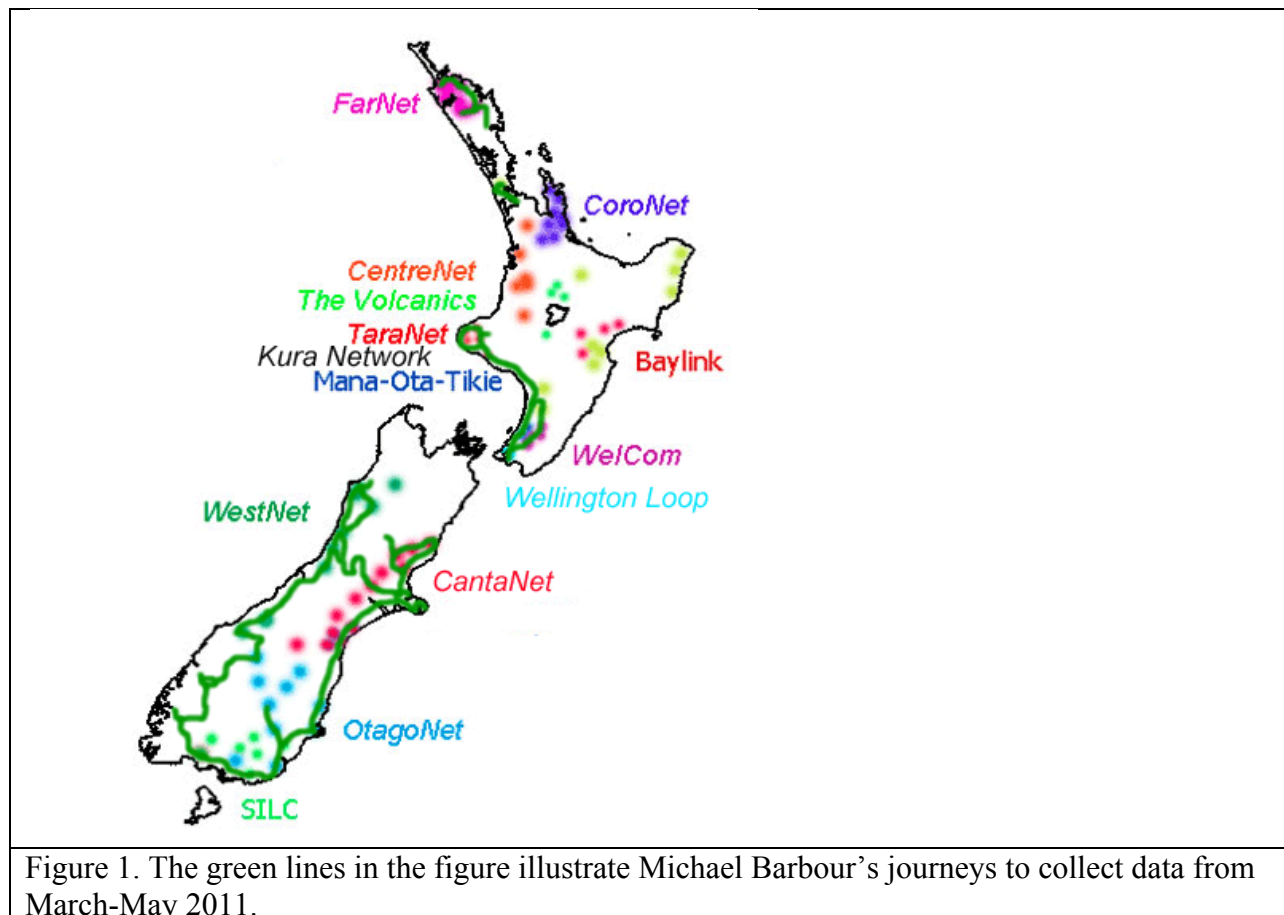Faced with these realities, the researchers amended the research questions to the following:

1. (a) What common barriers do e-learning clusters face in their development towards maturity and sustainability?
1. (b) How have mature and sustainable clusters overcome those barriers?
2. What are some examples of how networked schools are emerging in the New Zealand context?

With the exception of the online survey, the methodology and data collection methods have remained unchanged. The ethical procedures of Core Education were followed under the leadership of Dr Donna Morrow, acting chair. The documentation including the information and consent forms for volunteering participants can be provided on request. These are archived with Core Education.

There was interaction with individuals representing nine current and emerging clusters, as

well as site visits to 13 schools (see Table 1 for a complete list of data collected and Figure 1

illustrates the routes and places visited).

Table 1. Data Collected

Method of Data Collection	Data Collected
Interviews	10 former & current ePrincipals
	8 VLN cluster member school Principals and Deputy Principals
	12 eTeachers, eDeans & Facilitators
	18 Students
Observations	12 video conferencing lessons
	10 asynchronous work sessions
Documents	ePrincipal reports
	VLN-C documentation
	Asynchronous course content
	Data collected by individual clusters
	School newsletters
	Digital images from site visits

Figure 1. The green lines in the figure illustrate Michael Barbour's journeys to collect data from March-May 2011.

The data collected have been used to create fourteen digital stories and artifacts, along with the preparation of this final report. These are described in the following section.

In addition the project activities included more formal early dissemination that also encouraged evaluative feedback in three events. In order of the directness of the communication they were:

1. DEANZ Webinar on 24th May 2011 4-5 pm: "Illustrating online distance learning in schools in New Zealand and North America" - a DEANZ Webinar in association with the University of Canterbury e-Learning Lab & Core Education.
2. Lecture/blended online learning workshop for TECP111 course that introduced future teachers in the University of Canterbury to Virtual Schooling (around 200 first year students enrolled in the programme's offerings in Christchurch, Rotorua and in the flexible learning option).

PowerPoints from these lectures are available on request, and the presentations were recorded and so remain accessible if requested. The results from analysis of the data are presented in the following sections:

1. Artefacts for the *LCO Handbook*

2. Common barriers (i.e., research questions #1) and

3. Instances of emerging networked schools (i.e., research question #2).

Artefacts for the *LCO Handbook*

The first set of findings takes the form of illustrations for the *LCO Handbook*. The project collected a wide range of material that was analyzed to produce 14 artefacts to illustrate the handbook in the form of case studies and digital stories. It is worthwhile noting that the project promised a minimum of ten artefacts with a minimum of three digital stories. These will be integrated with the matrix in the online version of the handbook and aim to seed additional

illustrations and further development. In addition there are two recorded overviews that communicate the project as a whole, and some scholarly papers are also planned for later in 2011.

The analysis to produce these artefacts was based on the *LCO Handbook*'s overview matrix, which will be interactive in the online version. Artefacts were assigned to a phase (1-5) and then a dimension (a-k) (see Figure 2).

Figure 2. Matrix overview from *LCO Handbook*. Artefacts were assigned to a dimension (a-k) and phase (1-5)

There are a total of 14 illustrations for the matrix of the *LCO Handbook*:

- five case studies with a careful selection of transcriptions, video, documents, and/or other materials;
- five digital stories or video clips selected from an interview;

- plus an addition four case studies recorded by Michael Barbour (see Table 2 for a complete description)

Table 2. Description of the 14 illustrations

Matrix Cell	Artifact
1-a	A digital story featuring the ePrincipal of OtagoNet describing the importance of vision to a beginning or struggling cluster
2-a	A digital story featuring the ePrincipal of WeLCom describing the background and vision of that cluster, along with process the cluster took to ensure that its members had a common vision
2-b	A case study featuring the ePrincipal, school principals, teachers and students from the VLN Primary program describing the process of addressing learner needs
2-i	A case study featuring Michael Barbour describing different models for funding and resourcing clusters
3-a	A case study featuring documents from FarNet as examples of effective communication with cluster stakeholders
3-b	A case study focusing on the of the FarNet e-Learning Day
3-e	Two digital stories from eTeachers in WeLCom and TaraNet discussing the different things teachers need to consider when making the transition from a face-to-face classroom teacher to virtual teaching
4-b (learning centre)	A case study examining the asynchronous learning space provided to students that uses an OtagoNet school as an example
4-b (site facilitator)	A case study examining the deployment of a site facilitator using an OtagoNet school as an example
4-b (space & personnel)	A case study featuring Michael Barbour describing how schools should considering supporting students engaged in virtual learning
4-e	Two digital stories from eTeachers in WeLCom and TaraNet describing how teaching for one of the VLN clusters has impacted on their face-to-face classroom teaching
5-a	A case study featuring Michael Barbour describing the difference in how a sustainable cluster views its vision, compared with a mature cluster
5-e	A case study featuring Michael Barbour discussing opportunities for participation in the VLN to open up classrooms and schools
5-h	A digital story featuring the Co-Director of CantaNet describing the process that cluster uses to review its activities and mission

Further analysis was carried out to identify common barriers, which are now described in the following section.

Common Barriers

The first research questions asked focused on common barriers that clusters faced during their development, and for those more mature and sustainable clusters were able to overcome those barriers. Based on the data collected, there were three barriers that were common among the clusters: lack of vision; funding, resources and the role of the ePrincipal; and lack of inter-cluster and intra-cluster co-operation. However, in many instances there was a great degree of overlap between these three challenges.

Lack of Vision

The process of creating a vision for an e-learning initiative is critical and was clearly evident in this data. The importance of vision and leadership for school development has long been recognized (Timperley, Wilson, Barrar & Fung, 2007; Yee, 2000), but this has been slow to be recognised in relation to leadership across schools (Stevens & Davis, 2011). A vision provides the leadership a specific goal that they are able to work towards, along with a way to describe the overall purpose or function of the initiative to potential partners and outsiders. One of the most interesting themes that emerged was that the clusters that had the greatest level of support from their partner or participating schools were those who were able to articulate a vision for the cluster that went beyond the provision of distance education courses and opportunities that the tools could provide. Those clusters whose vision focused on the ability to provide distance education across the participating schools, or were based solely on teachers being able to use the tools to connect their students or themselves with like-minded colleagues, were the same clusters that were struggling to exist or were failing to emerge.

The process of establishing a vision and being able to articulate that vision is not an easy task. There are currently two types of clusters that this process critical. The first is the emerging clusters or those clusters that have yet to be recognised as official e-learning clusters or are just

beginning their journey. Many of these emerging clusters are located in urban areas, where the majority of participating schools would have large student populations. This complicates the visions process for these emerging clusters, as the leadership of these large, urban schools is under the mistaken impression that they are able to offer all of the curricular opportunities demanded by their students. This is further complicated by the fact that many of these schools compete against one another for potential students. These two factors make creating a vision that includes the sharing of resources and the provision of distance education a difficult sell for the leadership of the emerging cluster. At present, there are few urban examples for these emerging clusters to look to for guidance, however, the participation of two Auckland-area schools in FarNet and OtagoNet could provide some guidance on the benefits for an urban school in participating in an e-learning cluster.

The second type of e-learning cluster that the process of establishing a vision is critical for are those struggling clusters. There are some clusters where the number of participating schools, and even the level of participation by those schools still involved in the cluster, has decreased significantly. One example of a struggling cluster is TaraNet. In her Journal of Distance Learning article, Roberts (2009) described TaraNet as a cluster that had grown from 40 students enrolled in 12 courses in 2007 to 104 students enrolled in 21 different courses involving seven schools in 2009. Today the TaraNet cluster has been reduced back to only four schools, with 19 students enrolled in 15 courses. As a primarily rural area, with many small secondary and area schools, the challenges facing schools in the Taranaki region are not unlike challenges facing schools in the Far North or in the Otago region. However, TaraNet has not been able to get the buy-in from its participating schools in the same way that the FarNet or OtagoNet clusters have been able to achieve. This begs the question how does TaraNet differ from FarNet or

OtagoNet? A lack of a vision beyond the provision of distance education courses or the ability for teachers to use the tools would be one factor leading to the fact that TaraNet is currently a struggling cluster.

On the opposing end of the spectrum, many of the more sustainable (often older) clusters began the visioning process as a part of the specific funding programme that they used for the creation of their cluster. In many instances, the e-learning cluster still retains much of that original vision (generally due to the fact that there has been very little change in leadership, and any change that has occurred has come from within the cluster). While this history has allowed many of these clusters to become sustainable (largely due to their ability to sell their well-defined vision to their participating schools who support them), very few of these clusters have reach maturity. The current LCO Handbook combines sustainability and maturity, but the data support the separation of these two phases or stages of developments (and the importance of vision was one of the areas where this need to separate these phases became apparent).

Within the New Zealand context, there were several e-learning clusters that had reached the stage were their existence was not in question (i.e., the cluster was sustainable). However, there were no clusters that had reached the stage where – due to changes in membership, geography, personnel, etc. – the cluster was able to undertake a revisioning process to update their mission to accommodate these changes (i.e., the cluster had reach maturity). This is a theme that is discussed in greater detail in the "Examining the LCO Handbook Matrix" section.

Funding, Resources, and the Role of the ePrincipal

As expected of any e-learning initiative, issues surrounding funding and resources were a common barrier. Also like any e-learning initiative that is implemented across multiple schools, in some instances covering massive amounts of geography, adequate and stable funding and

resources are vital to sustainability and maturity. In the case of the e-learning clusters the funding and resources often described as being required included funding for the role of the ePrincipal and other cluster leadership, teachers for the distance education programme (both to teach the courses and to support students at the local level), professional development – both face-to-face and online – for those involved in cluster activities, the asynchronous (e.g., learning management system) and synchronous (e.g., videoconferencing bridge and equipment) tools, etc.. In some instances, individual e-learning clusters relied upon the support from their participating schools to provide its funding and resources; in other instances they relied upon the Ministry of Education or some nationally funded project to provide these items.

At present there are several clusters that are sustainable, largely due to the support and financial commitment of their partner schools. This commitment or buy-in from the partner schools was often due to the ability of the cluster and its leadership to articulate a shared vision that went beyond simply providing distance education. For most of these sustainable clusters, the Ministry was generally relied upon for the provision and support of asynchronous (i.e., the learning management system) and synchronous (i.e., videoconferencing bridge) tools. The remaining funding, to provide for the ePrincipal along with the provision of teachers and the hardware required for the distance education programme, were provided by the support received from participating schools.

In most of the e-learning clusters, participating schools provided one teacher to teach a single course within the distance education programme. By offering this one distance education course, the school had the ability to enrol students into any distance education course offered by that clusters (and in some instances in courses offered by other clusters). As the school's participation in the distance education programme increased, some ePrincipals indicated that

they would request that the school increase their contribution beyond a single teacher offering a single distance education course. No e-learning cluster had a formal system in place to require a school to contribute additional distance teaching if the request from the ePrincipal was turned down. In most clusters, participating schools also had to contribute a percentage of a teaching unit or a specific amount of money to fund the leadership of the cluster (e.g., the ePrincipal and other personnel). Participating schools were responsible for purchasing and maintaining the video conferencing equipment, along with any additional hardware, software and personnel to implement the distance education programme at their school. Schools who understood and had bought into the cluster's vision were generally quite willing to accommodate these expenses.

However, for the struggling e-learning clusters it was often difficult to get participating schools to allocate the funding for all of these resources. As many of the clusters were originally created under various nationally funded projects, most of the participating schools were provided the necessary video conferencing and computer equipment. When this equipment needed to be replaced or upgraded, some schools retreated to bottom line thinking and were unable or unwilling to justify the funds – often for a small population of students. Also, while there were some clusters that had one and a half or two funded leadership positions, some of the struggling clusters simply went without one or more of the items listed above within their cluster. For example, TaraNet has no funding for the position of ePrincipal, and the individual fulfilling that role does so in addition to their full-time teaching position. The TaraNet example is an important one, as every single ePrincipal interviewed expressed the importance of having a full-time ePrincipal, but many indicated it was one of the most difficult things to get participating schools to buy-in to funding.

Similarly, all of the ePrincipals interviewed, and almost all of the participating school principals and deputy principals, indicated a desire for the Ministry to fund the ePrincipal. Arguments for this funding ranged from the nature of responsibilities of the ePrincipal to the view that the ePrincipal should be viewed in much the same light as the principal of a regular school. What was most interesting was that when asked the ePrincipals themselves were unable to articulate a clear vision for what the role of ePrincipal entailed. Some might argue that the differences in vision, size, geographic scope, and even activities between clusters would mean there would be inevitable differences in the job description for the ePrincipal. However, the same thing can be said of the differences one would find in a physical school in Te Anau compared to a school in Auckland compared to a school in Masterton and so on. Yet, one would suspect the principals of the schools in each of those three locations – and any school in New Zealand – would provide a similar answer when asked to describe the role or the job description of a traditional face-to-face principal. Given this inability to firmly and consistently define the role of the ePrincipal, beyond a description of what each individual ePrincipal was responsible for, make constructing a case for this funded position difficult – if not impossible. Struggling clusters, whose vision was focused on the provision of distance education or who have often had their activities reduced to the provision of distance education, have had a particular difficulty in making a case for a full-time ePrincipal (which is why some of the ePrincipals are not fully funded or funded at all).

Lack of Inter-Cluster and Intra-Cluster Consistency and Co-operation

At present, the VLN is a collection of largely regional groups that have been created under various funding projects. The specific focus of the funding programme that created each cluster influenced the vision and activities of each individual cluster. While there is some

consistency in terms of activities (for example, almost all of the e-learning clusters provide distance education offerings to their students), there is little consistency of vision between each of the clusters. This lack of consistency has hindered any national development of virtual learning practice of policy in New Zealand. Even with the creation of the Virtual Learning Network-Community (VLN-C), there has yet to be a consistent message for the development of virtual learning throughout New Zealand (beyond a consistent call for additional resources from the Ministry of Education and other sources).

This is not to suggest that the regionalised system should be scrapped in favour of a national system. There are legitimate local concerns that a national system would not be attuned to and, even if it was familiar with those local issues, unable to accommodate. Yet, there is much room within the existing system for a greater level of consistency and cooperation. For example, at present there are five clusters – along with Te Kura – that offer level three art history. Similarly, there are five different clusters that offer level three calculus, along with four different clusters that offer level two physics, level three physics, and level three Spanish. In fact, 30 of the 61 unique level one through three courses that have enrollments listed in the VLN brokerage website have more than one cluster or provider offering the course.2 Do the six level three art history eTeachers communicate with each other? Have all six eTeachers designed their own asynchronous course content that is housed in Moodle or some other learning management system or repository? Do each of the six eTeachers have access to each other's course materials? If one of the benefits of participating in the VLN is the ability to connect subject matter teachers with each other online to collaborate, it begs the question of whether these eTeachers – probably better placed than any other teacher within the New Zealand education system because of their familiarity with the hardware and software – actually interact with each other? If the answer to

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2 See http://pol.vln.school.nz/

these questions is in the negative, which was the case with almost all of the eTeachers interviewed for this study, than a tremendous opportunity has been lost. Further, resources that did not need to be used have been expended. For example, what is the resource cost to provide professional development to six individual eTeachers on how to use a variety of tools to create asynchronous course content to support their online courses? What is the resource cost for six eTeachers to each develop their own asynchronous course content independent of each other? This is not a challenge that is isolated to the clusters involved in offering levels one to three courses. Both BayLink and the VLN Primary have separate Year 7-8 Te Reo Maori courses listed in the VLN brokerage site. Do these two eTeachers interact with each other?

Beyond the eTeachers teaching one of the 30 levels one through three courses offered by multiple clusters, is there interaction from eTeachers across courses. For example, do the five level three calculus eTeachers interact with the level three mathematics eTeacher or the four level three statistics and modeling eTeachers? Do these ten level three maths eTeachers interact with the two eTeachers responsible for level two mathematics and/or the one eTeacher responsible for level one mathematics? Is it possible for a student to register for level one mathematics with SILC this year and become comfortable with the way in which their teacher uses their video conferencing classes and with the resources and material provided in their learning management system only to have to become familiar with a completely different method of synchronous instruction and asynchronous material and resources that appear completely foreign to them next year when that student enrolls in level two mathematics offered by OtagoNet? Outside of the senior secondary level, have the two Year 7-8 Te Reo Maori eTeachers ever interacted with the two level one Te Reo Maori eTeachers or the single level three Te Reo eTeacher?

The lack of interaction between eTeachers of the same course and of the same subject matter, along with the lack of consistency between course how courses are designed and delivered, is a major barrier – both to the further development of individual clusters (and the VLN as a whole) and the student experience and their ability to succeed in the virtual learning environment. Like the challenge of developing a consistent vision for e-learning for the whole of New Zealand, the lack of interaction among eTeachers and consistency between courses could be remedied through a greater level of systematic cooperation by the individual e-learning clusters.

Examples of Emerging Networked Schools

The second research question focused on identifying examples of the emergence of networked schools throughout New Zealand. The concept of networked schools is described in some detail in the recent report, e-Learnings: Implementing a national strategy project for ICT in education, 1998-2010, published by CORE Education (see Figure 3).
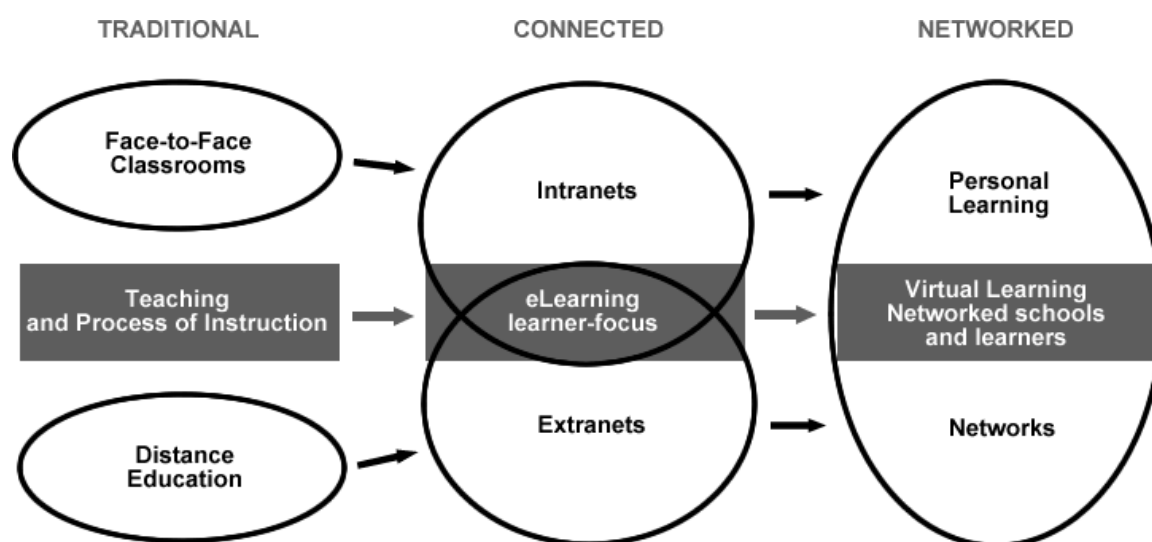

Figure 3. A vision of networked schools (Wenmoth, 2010)

In the traditional school model, the face-to-face school existed independent of the distance education opportunities. Historically, if you recall the initial development of Te Kura/The

Correspondence School, where students were either enrolled in a physical or brick-and-mortar school or enrolled in Te Kura. Over the decades since the creation of Te Kura, this model has evolved to the point where today there is an overlap between the brick-and-mortar school and the distance learning opportunities. In this connected school model, students attend a brick-and-mortar school, but may take one or more courses through Te Kura or one of the VLN e-learning clusters. Networked schools, however, are where the integration of face-to-face learning and distance learning has become seamless. Essentially, an observer looking at a networked classroom would not be able to tell if the students were learning from a face-to-face teacher or from an online one.

There were four main examples or emerging examples of networked schools from the data that was collected: changing teacher practice, opening classrooms, the role of the school-based facilitator, and re-considering student learning space.

Changing Teacher Practice

During the interviews with the eTeachers, along with all of the ePrincipals who had or were teaching virtual learning courses, it was apparent that teaching in a virtual learning environment was a catalyst for changing the teachers' traditional classroom practice. In a traditional school, the primary role of the teacher is was as a generalist that was responsible for designing their own curricular materials for a variety of subject matter courses and delivering the content to a specific group of students. The connected school saw the emergence of subject matter experts who still had to design their own curricular materials, but the delivery of the content varied from direct instruction to facilitation. Within a networked school, the role of the teacher is as an experienced learner – an individual, who is able to mentor and provide guidance to students as they make their own way through content, using resources of their choosing.

The current model for virtual learning in New Zealand often includes a single hour of synchronous interaction through a video conferencing system and three or four hours of asynchronous time where students are responsible for working through the content. For a teacher who is working in this environment, this means they need to design or provide resources and activities for the students to complete, primarily on their own, for 75% to 80% of the time devoted to that course. It also means that a teacher has to use that limited synchronous time with the students to ensure students have understood the material they have completed on their own and provide an overview for the content they will be responsible for during the coming week.

When a teacher has created or located online resources and activities for their virtual learning students to complete, a natural extension of their professional practice is to provide that same content for their face-to-face students. This was the most basic example of how teaching in a virtual learning environment had influenced a teacher's classroom practice. The teacher would use the learning management system to provide their face-to-face students with access to the online materials that had designed or located. The next natural step was for those eTeachers to begin to use other aspects of the learning management system with their face-to-face students. For example, teachers often made use of the assessment features in the learning management system to provide practice exams for revision purposes. Teachers also used the discussion forum to allow students to post questions that were only tangentially related to the course content or that might only be of interest to a small number of students in the class. Some teachers even used the learning management system, and other synchronous tools from their virtual teaching, to allow students to communicate content-based questions outside of class time – essentially extending the learning environment beyond the physical borders of the classroom (both in terms of time and space).

Another common example of how teaching in a virtual learning environment influenced a teacher's classroom pedagogy was how they delivered or facilitated their classroom instruction. The synchronous video conferencing time forced eTeachers to condense their direct instruction to only the most basic and fundamental concepts, along with providing time for remediation of material that had been previously covered. Within their face-to-face teaching, many of the eTeachers expressed dissatisfaction with their traditional pedagogy that generally devoted more time to direct instruction. To use an overused cliché, the virtual learning environment had forced these teachers to transition from a sage on the stage to more of a guide on the side, and this also began to be reflected in their classroom practice.

There were other examples, although these were not as common, where eTeachers had taken to organising their face-to-face students' learning experiences in a manner that was more consistent with the way in which their virtual learning students learned. For example, there were several instances where the teacher would begin each lesson with an overview and then have students complete tasks and activities using their textbook, other physical resources, content in the learning management system, and other online resources on their own while the teacher provided assistance as needed by the students. There were other examples where students would submit projects and assignments through the learning management system. There were also examples of teachers who would make themselves available on Skype or some other synchronous tool for a period of time the night before an assessment deadline (i.e., a project due date or a test the following day) so students could ask them any last minute questions.

While teaching in a virtual learning environment affected the classroom practice of eTeachers, it also had the potential to influence the practice of other teachers at the local school level. In some instances this was due to the fact that the eTeacher was interested and excited

about their changing pedagogy and wanted to share it with their colleagues. In other instances it was because the students had the eTeacher for a course one year and would put pressure on the teacher responsible for the next course (who had not had the experience of teaching in a virtual learning environment). There were also instances where the teachers themselves became curious and interested in what the eTeacher was doing in their face-to-face classes. Regardless, there were a number of examples where many individual non-eTeachers had begun to use tools from the virtual learning environment (and at least one example in the FarNet cluster where an entire department had adopted use of the tools).

Opening Classrooms

The nature of the distance education classroom is that it allows students from a variety of geographic locations to learn from a single teacher. The prevailing conception of virtual learning within New Zealand follows this distance education paradigm, where some or all of the students are physically distant from the teacher. This was not the only model of virtual learning occurring in New Zealand. There was one school in the WeLCom cluster where an eTeacher's classroom practice had been influenced by his experience with teaching in a virtual environment. However, this particular eTeacher did not limit that influence simply to his classroom pedagogy, but also the organisation of his classroom.

This particular eTeacher taught social sciences and, like many of the teachers described in the previous section, he had begun to use the asynchronous course content he had created for his online courses with his face-to-face students and had also began to teach in a manner consistent with his online teaching (i.e., where he would provide limited direct instruction and used class time to facilitate his students' movement through the activities in the asynchronous course content). One of his social science courses had an enrollment of 15 students, but only

eight of the students were physically present in the room when he was scheduled to teach the course. The other seven were scheduled for this course at times that fit into their timetable, but while this teacher was scheduled to teach other courses.
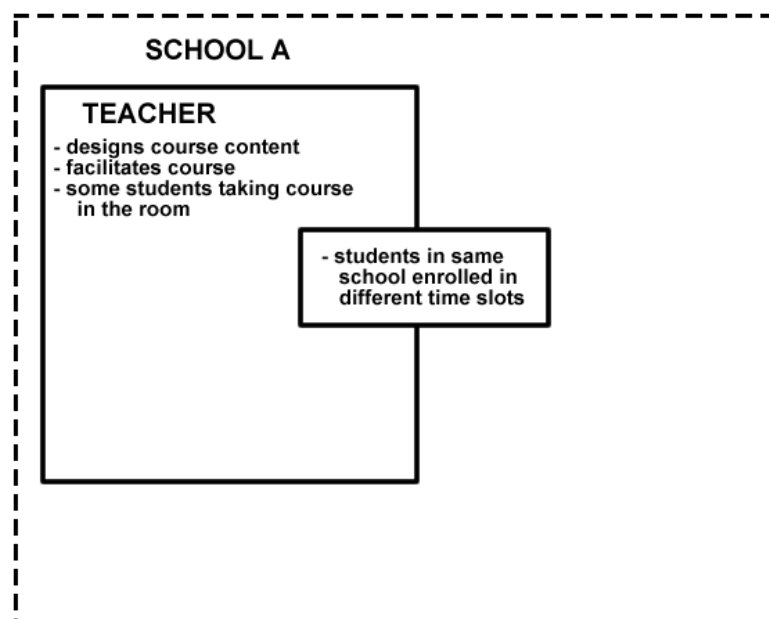
Figure 4. The model utilised by one WeLCom social science teacher.

Under this model, the students who were scheduled for this particular humanities course during period when the teacher was scheduled to teach it came to his classroom and he would introduce the topic, tasks, and/or activities for the day; and then begin to facilitate the students as their progressed through the curriculum. For the seven students who were scheduled to take this course during our periods, they would go to the library or a computer lab. The teacher would have sent the same instruction provided to the face-to-face students electronically. If the students needed assistance from their teacher, they would e-mail him or send him a Skype message. In some instances, the teacher would take a few minutes to go to where the student was located or the student might be told to come to the teachers' classroom if the assistance was more involved than could be efficiently communicated in text-based medium. As the teacher structured all of

his courses in the same manner, it wasn't as if these students would be interrupting the teacher while they were "teaching" another course.

This example was a single teacher at a single school, and only involved one of his courses, but it highlights the potential for thinking about school organisation in a different way. If a connected school can allow their students to enroll in a distance education course, taught by a teacher located in a different geographical location, why can't a networked school allow its students to take a course at a different time than when the teacher responsible is actually teaching it? Similarly, if the students at School A do not need to be in the same room as their teacher, why can't students from another school enroll in that teacher's course as well?
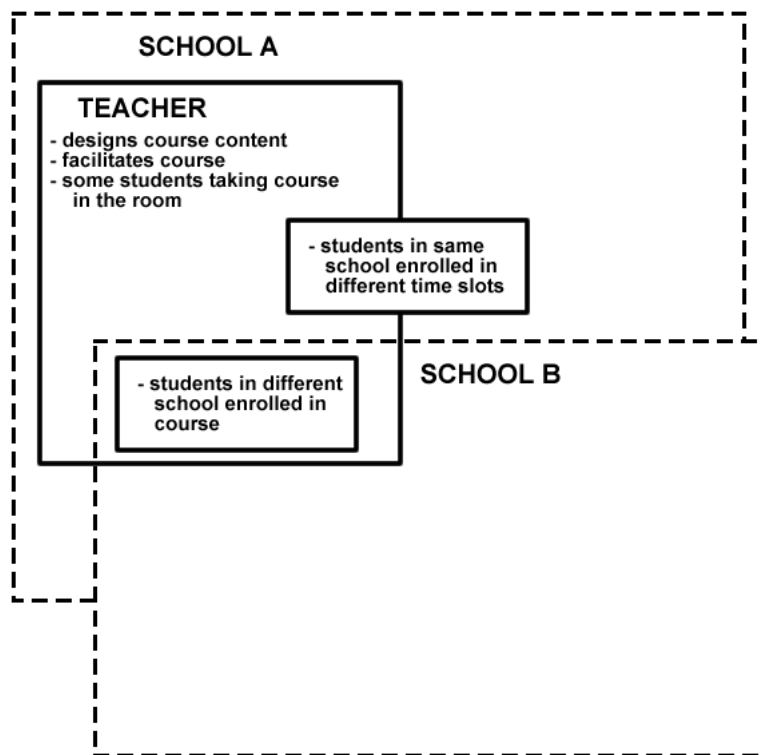
Figure 5. Potential extension of that model to include a second school.

The addition of a second school is consistent with the dominant view of distance education – students physically distance from their teacher (at least for the students attending School B). To make the transition from a connected school to a networked school, the addition of additional

schools would need to include more than simply having students enrolled in a distance education course… If students from schools in different geographic locations can be connected to a single teacher, why can't teachers be connected as well?
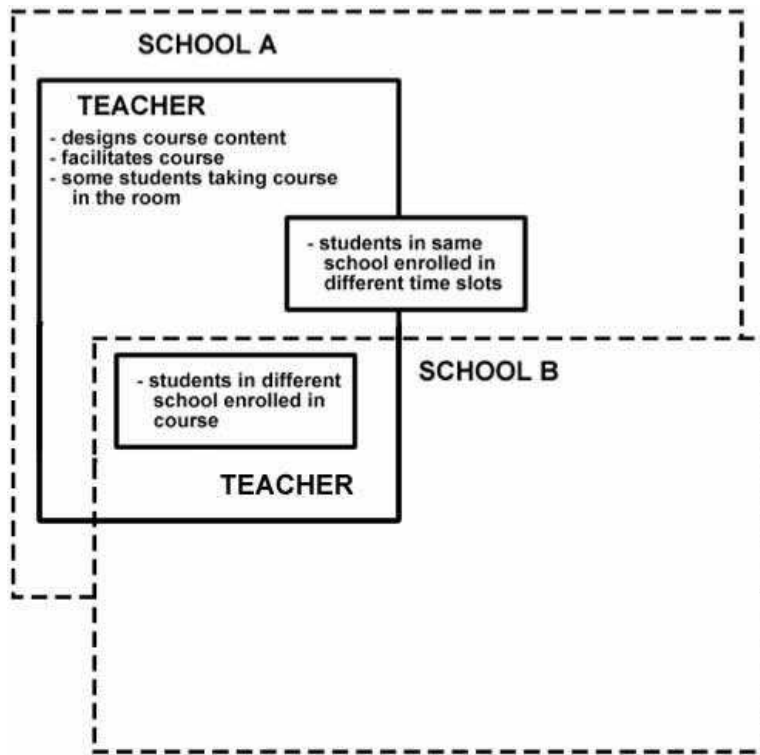
Figure 6. Potential extension of that model to include a second teacher at that second school.

In a truly networked school, two humanities teachers could teach students from each of their own schools in a single course. For example, if this were a geography course, the teacher from School A could be responsible for taking the lead on designing and delivering the instruction on the topics of understanding of population concepts and environments that have been shaped by an extreme natural event. The teacher from School B could simply be available to both sets of students (their own students in a face-to-face manner and to the other students in an electronic format) as another subject matter expert that students could use as a resource. Vice versa, while the teacher from School B was taking the lead on the sustainable use of a natural resource topic, the teacher from School A would be available to support the students.

Stevens and his colleagues have written extensively about the use of distance education as a means to link classrooms to create an open model of schooling (see Stevens 1999, 20002, 2003, 2004, 2006, 2007; Stevens & Moffat, 2003). This open model, which was developed based on audiographics and internet-based distance education initiatives in New Zealand and the Canadian province of Newfoundland and Labrador, described a system of schooling where schools as unique or closed entities would have their staffing, students, and administrative functions (e.g., student information, timetabling, etc.) linked for a portion of the school day. While these closed schools were connected, the boundaries between one school and another would not be discernable because the schools were opened – or networked to use Wenmoth's nomenclature.

This virtual team teaching could allow teachers to specialise beyond a specific subject matter (e.g., history) to provide students with instruction and support at the topic level (e.g., Tudor/Stuart England or World War II). In a networked schools, students should be able to access curriculum at a granular level (e.g., topics within a course, as opposed to a complete course). Similarly, in a networked school teachers should perform the role of an experienced learner that helps facilitate the student's experience with the learning process. A networked school should provide model of education where teachers are not responsible for delivering complete courses to students only at their own school, but where teachers are responsible for individual pieces of course content and students from many different schools. In this model of education, the teacher is also responsible for being the more knowledgeable other in the room for the local students at their school, because as an experienced learner of a specific subject area they should be able to help guide the students on their educational journey.

The Role of the Mentor Teacher

The introduction of virtual learning to the primary and secondary environment has resulted in changes to the traditional role of the teacher. Davis and her colleagues (Davis, 2007; Davis & Niederhauser, 2007), along with Ferdig, Cavanaugh, DiPietro, Black and Dawson (2009), identified different teacher roles that existed within that virtual learning environment as compared to the traditional face-to-face, brick-and-mortar school setting (see Table 3).

Table 3. Teacher roles in virtual learning environments

Davis' roles	Davis' responsibilities	Ferdig et al.'s roles	Ferdig et al.' responsibilities
Designer	Design instructional materials. Works in team with teachers and a virtual school to construct the online course, etc.	Instructional Designer	The creator of the online course in accordance with content standards using effective strategies for the learners and the content
Teacher	Presents activities, manages pacing, rigor, etc.. Interacts with students and their facilitators. Undertakes assessment, grading, etc.	Teachers	The educator with primary responsibility for student instruction within an online course including interaction with students and assigning course grades
		Online Facilitator	The person who supports students in a virtual school programme. The facilitator may interact with students online or may facilitate at the physical site where students access their online course.
Facilitator	Local mentor and advocate for students(s). Proctors & records grades, etc.	Local Key Contact	The professional who assists students in registering and otherwise accessing virtual courses
		Mentor	The academic tutor or course assistant for students
		Technology Coordinator	The person who facilitates technical support for educators and students
		Guidance Counselor	The academic advisor for students
		Administrator	The instructional leader of the virtual school

To date the role of designer – separate from the eTeacher – has yet to emerge within the virtual learning provided by New Zealand's e-learning clusters, however, all of the other roles do exist within the system (see Table 4).

Table 4. Teacher roles within New Zealand e-learning clusters

New Zealand e-Learning Clusters	Davis' roles	Ferdig et al.'s roles
eTeacher	Teacher	Teacher Online Facilitator
eDeans Site Facilitators Local Coordinators	Facilitator	Local Key Contact Mentor Technology Coordinator Guidance Counselor
ePrincipal Project Leader Cluster Coordinator Director		Administrator

Yet, to date there has been little consideration of the formal duties of any of these role beyond that of eTeacher.

To use the Davis model, as the more simplistic of the two, the personnel interactions within virtual learning in the New Zealand context resemble Figure 7.

Supporting Roles

VS Class

School

School

School

T - Online Teacher	A - Administrator	S - Online Student	F - Facilitator
D - Course Designer	IT - Tech Support		P - Parent/Guardian
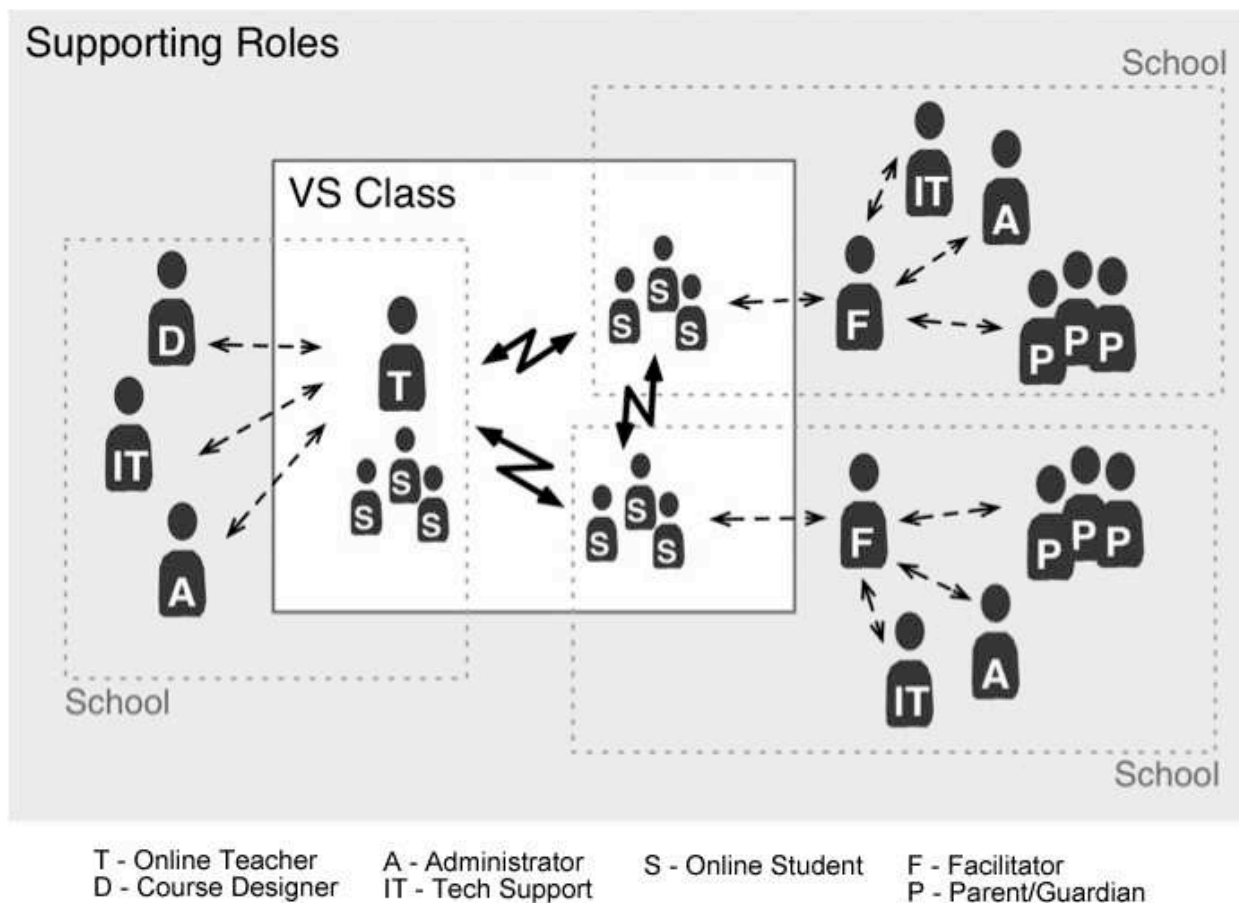
Figure 7. Conceptual model of supplemental virtual learning (Davis, 2007).

In this model, the facilitator is responsible for supporting the students' virtual learning. Within the current New Zealand system, the role of the facilitator (i.e., eDean, Site Facilitator, Local Coordinator) is often regulated to administrative duties (e.g., taking attendance, supervising assessments, entering grades, contacting the eTeacher, pastoral care responsibilities, monitoring students' progress, interacting with the students' eTeacher, etc.). However, there were some instances where – in addition to those administrative tasks – this individual took on other responsibilities that changed the nature of the classroom environment for their students.

In several schools in a number of different e-learning clusters, the school-based facilitator was responsible for more than simply the supervision and pastoral care of the students. There were examples where a school-based facilitator would be available to the students during their

asynchronous work time (i.e., when they weren't attending a synchronous video conferencing session). In these instances, the facilitator was available to meet with students individually to discuss their work and their progress, along with being able to assist students with many of the content-based questions they had. The longer an individual spent as the facilitator in this kind of situation, and the more consistent there was in the course offerings the school received through distance education, the facilitator was often able to build up a substantial level of expertise in the course content the students were responsible for completing. The increased expertise of the facilitator provided the students with access to two teachers that were subject matter experts – their distant eTeacher and their school-based facilitator.

There were other examples where the school-based facilitator would attend the synchronous video conferencing sessions with the students. This allowed the facilitator to supervise the students during their video conferencing class to ensure they were paying attention. It also allowed the facilitator to take notes for the students, and if the facilitator was taking notes for the students they were free to pay more attention to the content of the class. Finally, by attending the video conferencing session the facilitator was able to gain a better understanding of the content that was being taught. If the facilitator knew the content they would be in a better position to help the students during their asynchronous time. The decision for the facilitator to attend the video conferencing classes was often made based on the nature of the students enrolled in a particular course. For example, a number of schools had their facilitator attend the video conferencing classes of students enrolled in agriculture courses, as these students were often seen as weaker academic students and needing these additional supports.

One of the goals of a networked classroom is the integration of face-to-face and virtual learning is so seamless that an observer is unable to determine when the student is engaged in

their face-to-face learning and when they are engaged in their virtual learning. An active facilitator that is responsible for not only the supervision and pastoral care of the students, but also provides content-based assistance and even limited instruction to students for their distance education is an example of a teacher in a networked classroom. This is particularly true in instances where the facilitator may have or have gained subject matter expertise, and was able to support the distance instruction while the students were engaged in asynchronous learning.

Re-Considering Student Learning Space

As education and formal K-12 schooling is something that everyone experiences, society has a specific perception or understanding of what a classroom learning space should and, in most instances, does look like. For those involved in distance education, when asked to describe the space provided for distance education the vast majority begin to describe the space allocated for the synchronous video conferencing classes.
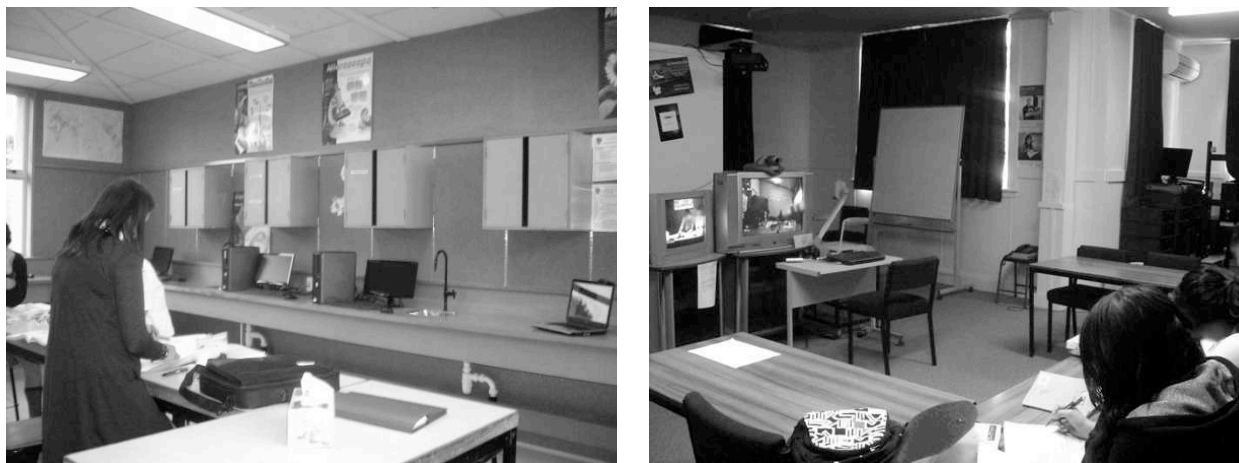
Figure 8. Video conference space in a variety of e-learning clusters.

This synchronous video conferencing space is consistent from school to school. Generally

speaking it includes two televisions, with a camera set on top of one of the televisions. There is

often a desk or table that includes the control pad, a document camera, and a laptop. There may

be additional desks or tables in the room, depending on the number of students that need to be

accommodated at any given time. The set-up is so predictable that there is a better than average

chance that there will be a blue curtain against the walls to provide a background for the camera.

Anyone involved with the e-learning clusters throughout New Zealand was able to describe that

learning space.

However, when asked where students went to learn when they were not scheduled to be

in the video conference room there was little consistency in the responses. In some instances,

students would go to a library, resource centre, computer lab, or even an unsupervised, empty

classroom. In other instances, the students would complete their asynchronous work in the back

of another teachers' classroom while they were teaching a different group of students. There

were some examples where schools had set aside a specific space – a distance education room of

sorts – for students to use during their asynchronous time. These distance education rooms were

often simply a space provided to the students that they could take ownership of, but were not

specifically created as an asynchronous learning space. But there were a few examples where the

school leadership had given some consideration to providing a space that was conducive – even

fostered – student learning during their asynchronous work time.

Figure 9. Student learning centre at Roxburgh Area School.

Some of the things that were often provided in this space included Internet connected computers,

desks for students to work by themselves or tables for them to be able to work in groups, and

books and other physical resources identified as being useful for the specific distance courses the

students were completing.

There were no examples of an asynchronous learning space that was specifically

designed for that purpose. The spaces that were provided, even those that had forethought to the

asynchronous learning purpose, were converted classroom or office space. For example, many of

the schools with this asynchronous work space had desks for students to work individually, but

those desks did not have barriers to isolate the student from another group of students who may

be working collaboratively at one of the tables. Simply put, here were no examples of a space

that had been built within a school to accommodate unstructured, asynchronous instruction by

students working individually or in groups, often with both happening at the same time.

However, there was one school that had begun to plan a space for that purpose (see Figure 10).
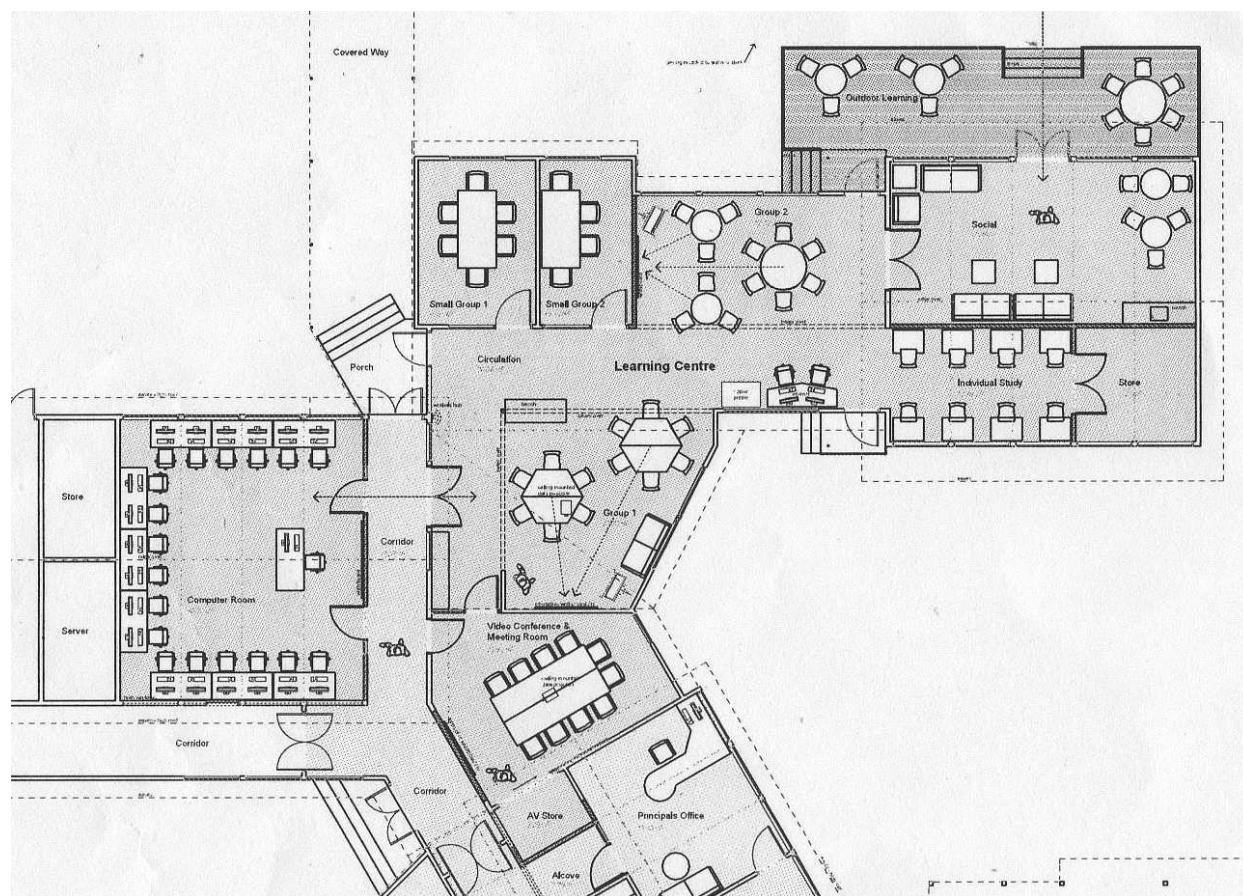
Figure 10. Floor plans for a new student learning centre at Roxburgh Area School.

In these floor plans the video conferencing room is located near the bottom, with entrances to

both the corridor and the learning centre. The learning centre itself isn't a single, open room. The

learning centre is a series of smaller spaces that are designed to allow students to work

individually or in groups without having to interact or disturb other students. For example, a

group of physical students could be working together on a group project in one of the two rooms

with the rectangular tables, while another group of mathematics students would be working individually on a problem set in one of the larger rooms with the circular tables and still have access to each other if they ran into problems they didn't understand or if they wanted to check their work against each other. Both of these rooms may or may not have Internet-connected computers, depending on the decisions of the school leadership and the individual needs of the students. At the same time, several students could be in another room at the individual desks reading a novel for their English course. Finally, across the corridor form the learning centre is a traditional computer lab.

One can only imagine the above scenario (i.e., with the physics students working on their group project, the mathematics students working on and comparing their answers to a problem set, and English students trying to read a novel) occurring at the same time in the spaces that are currently used for students during their asynchronous work time. The chaos from the multiple activities, the noise from the groups of students and the increased off-task behaviour due to that volume of noise, the inability of the English students to focus on their novel with everything else that was happening, etc.. This is not to fault any one of these three groups of students, as they are all engaged in what it is they are supposed to be working on during their asynchronous time. The space was simply not designed to accommodate all of these learning activities at the same time. However, the planned asynchronous learning space in Figure 8 is specifically designed to allow of this to occur at the same time in the same space.

Extrapolating the use of this space beyond the students' asynchronous distance education time, it is easy to see school-based teachers using this space to teach their own classes. If a networked school is one where the teacher becomes an experienced learner who is present to help guide the student through the learning process, an open school environment such as the one

described above allows students to work individually or in groups – based upon their own progress through the curriculum. It allows the teacher to act as a facilitator or more knowledgeable other, and simply one of many resources available for the students to use. As the experienced learner, there will be times when the teacher will need to mentor the students – both individually and in small and larger groups – to ensure that they are able to maintain progress in their education.

Examining the *LCO Handbook* Matrix

At present the LCO Handbook matrix has five phases from proposal to scoping to planning to implementation and ending with maturity sustainability. The purpose of this study was to trace the development of e-learning clusters from the proposal phase through to the maturity sustainability phase. The maturity sustainability phase is described in Table 5.

Table 5. *LCO Handbook* maturity sustainability phase

Dimension	Phase 5 – Maturity Sustainability
Relationship and Communications	Develop and enhance relationships both within the cluster and outside the cluster.
Learner Needs	Review current teaching and learning practices to ensure learner needs are met.
Logistical Coordination	Working with others outside the cluster.
Professional Development and Support	Maintain programmes of regular professional learning opportunities for teachers.
Pedagogy	Establish a culture that accommodates changing pedagogical practice.
Technical Coordination	Developing strategies for review and adoption of new and emerging technologies.
Learning and Teaching Resources	Regularly review teaching and learning resources to ensure they are current and up to date.
Administration and Support Strategies	Regularly review systems to ensure LCO management is sustainable.
Finance/Funding	Develop a 3–5 year financial plan to support strategic plan.
Evaluation and Strategic Planning	Implement a self-review process aligned with meeting cluster goals and strategic planning.
OUTCOME	*LCO remains fresh and self renewing.*

Yet, one of the things that began apparent over the past six months is that there is a difference between a sustainable cluster and a mature cluster. A sustainable cluster is one that has the ability (i.e., the support from participating school, the funding, the activity towards a cogent vision, the administrative structure, etc.) to continue to exist. However, a mature cluster is one that has the security in its continued existence that it is able to renew – and even modify - its mission to reflect a changing membership and/or the changing needs of its existing membership.

Currently, there are several e-learning clusters that are sustainable. It was the professional opinion of the researchers that there was no cluster that was mature. Many of the clusters had secure funding, stable leadership, and supportive membership that would ensure their continued existence and even future growth. However, that growth would be based upon an acceptance of the cluster's existing vision. If a potential school's needs differed from the vision of the cluster in which it was geographically based, the vast majority of clusters were not in a position to undertake a revisioning process with its current member schools to accommodate the needs of that potential new member school. For example, there was one cluster that had eight to ten member schools, with three to five additional schools in its geographic region. Because the e-learning needs of these three to five additional schools would have been quite different than the existing member schools the leadership of the cluster had made the decision to exclude these schools (and some of the existing members had even indicated they would withdraw from the cluster if any of these additional schools were to join). This was a cluster that was quite sustainable, however, it wasn't mature enough to accommodate these additional schools.

These are the reasons it is recommended that the maturity sustainability phase be separated into a sustainability phase and a maturity phase (see Table 6).

Table 6. LCO Handbook sustainability phase and maturity phase

Dimension	Phase 5 – Sustainability/Maturity	Phase 6 – Transformative
Relationship and Communications	Develop and enhance relationships both within the cluster and outside the cluster.	Re-visioning of the philosophy and context
Learner Needs	Review current teaching and learning practices to ensure learner needs are met.	
Logistical Coordination	Working with others outside the cluster.	Re-examination of the cluster needs
Professional Development and Support	Maintain programmes of regular professional learning opportunities for teachers.	
Pedagogy	Establish a culture that accommodates changing pedagogical practice.	Update purpose
Technical Coordination	Developing strategies for review and adoption of new and emerging technologies.	
Learning and Teaching Resources	Regularly review teaching and learning resources to ensure they are current and up to date.	Revise goals and principles
Administration and Support Strategies	Regularly review systems to ensure LCO management is sustainable.	Renew and expand membership
Finance/Funding	Develop a 3–5 year financial plan to support strategic plan.	
Evaluation and Strategic Planning	Implement a self-review process aligned with meeting cluster goals and strategic planning.	Sustainable funding model
OUTCOME	*LCO remains fresh and current.*	*LCO is self renewing.*

This new, separate maturity phase would follow the model found on Phase 1 – Proposal. The rationale for using this model is that the proposal phase is designed to provide an initial vision, to get potential member schools to buy into that vision and put in place the necessary resources – including funding – for the cluster to begin. This separate maturity phase is designed to go through many of these same steps as it revises its vision and activities to accommodate new members of the changing needs of existing members, essentially the process of going beyond business as usual (or sustaining the cluster's current vision and activities).

Recommendations for the Future Development of Virtual Learning

The history of primary and secondary distance education, and more recently virtual learning, has developed to meet the regional needs of many schools throughout New Zealand. That development has occurred without a great deal of national intervention, and often in the absence of research and/or policy to guide it. With the national funding programmes over the past decade, along with the recent announcement of national broadband initiatives, virtual learning is at the cusp of either continuing to develop as a patchwork of differing, often competing, visions of online distance education; or becoming an avenue to reform the nature of schools and schooling.

In order to meet the opportunity to become an agent of change within the traditional schooling sector, some recommendations for the individual e-learning clusters, the Ministry of Education, and for future research into virtual learning in New Zealand are provided.

E-Learning Clusters

There are two main recommendations for the individual e-learning clusters. The first focuses on the coordination of activities between clusters. While the clusters' leadership interact through the VLN-C, there were only a few clusters that had developed strong working relationships. In many instances, these relationships took on the form of mentoring or mutual assistance at the leadership level. However, rarely did that relationship filter past the cluster leadership. There were examples of teachers using the infrastructure provided by the e-learning clusters to collaborate beyond their physical school location, these examples were isolated. Similarly, there were examples of eTeachers collaborating with each other – either within a cluster or from multiple clusters, but again these examples were isolated. The leadership of the individual clusters need to foster inter-cluster collaboration, particularly among their eTeachers.

For example, all six level three art history eTeachers should interact with each other on a regular basis. The five level three calculus eTeachers, the level three mathematics eTeacher, and the four level three statistics and modeling eTeachers should interact on a regular basis. These ten eTeachers should also interact with the two level two mathematics eTeachers and the one level one mathematics eTeacher on a regular basis.

However, these inter-cluster activities should not be limited to eTeacher course or departmental meetings. The leadership of the individual clusters should work together to determine a consistent list of virtual learning tools that will be used by all of the clusters. They should also work together to develop a common navigation to be used in their learning management systems, along with a common look and feel for their asynchronous courses content. A student, who has to enroll in a course from one cluster in level one, should not have to learn how to succeed in a completely different environment when they enroll in their level two course from a different cluster. Virtual learning is difficult enough for an adolescent learner, and having to become familiar with a completely new way of learning each time they take another online course further hinders their chance at succeeding. Increased coordination of the organization and activities of the e-learning clusters will allow for a more consistent approach to virtual learning nationally.

While each of the ePrincipals interviewed, along with many of the principals and deputy principals of participating schools, spoke of the need for the Ministry of Education to provide a portion of or all of the funding for the ePrincipal; at present the ePrincipals have yet to make a business case for this expenditure of funds. In their descriptions of the role and responsibilities of the ePrincipal, no one was able to provide a job description that went beyond what would be expected of a traditional face-to-face principal or a technology-based project leader. Physical

schools are expected to provide their student and teacher populations with the appropriate

administrative staff. If a physical school chooses to become involved in a multi-school project

that involves their students and lessens the direct teaching responsibilities of teachers at each of

the individual schools, the coordination and administration of that technology-based project

should be born by the schools. Further, at present the largest e-learning clusters' distance

education programmes are 300-400 enrolments; which represents approximately 80-100 full-

time student enrolments. Some clusters have distance education programmes as small as 5-10

full-time student enrolments. Based upon the current responsibilities assumed by the ePrincipals,

the Ministry of education is justified to not provide funding for approximately 15 ePrincipals.

The business case simply does not exist. This is not to say that there shouldn't be Ministry-level

support for some kind administrative or coordination role in the virtual learning environment.

The leadership of the e-learning clusters, potentially through the vehicle of the VLN-C, needs to

examine both the role of the leadership within the VLN clusters and whether there is additional

geographic or like-minded rationalisation of the clusters that can occur (e.g., the merger of

CantaTech and AorakiNet to form CantaNet).

  These recommendations for the individual e-learning clusters are designed to provide a

coordinated approach to virtual learning, and e-learning, that should allow for the development

of a national vision. The alternative is the current de-centralized and regional efforts that exist

today. While this current model has served some regions and some schools quite well, there are

several regions where these e-learning clusters are struggling and other regions where they have

never existed. Further, there are still schools within the regions served by the current e-learning

clusters that have not been able to take advantage of the opportunities provided by the clusters.

To ensure that all schools and all students in New Zealand have the ability to take advantage of

the opportunities offered by the e-learning clusters, the clusters need to move beyond their limited geographic reach and visionary constraints to a more cooperative, national approach.

Ministry of Education

There are three recommendations for the Ministry of Education to assist with the development of e-learning in New Zealand. The first is a continuation of the brokerage services currently provided by the Ministry, specifically the provision of synchronous and asynchronous virtual learning tools. While the specific tools are likely to change over time, providing a single synchronous tool and a single learning management system that clusters can access free of charge is a meaningful role for the Ministry. Further, as the connectivity provided to schools increase through the implementation of the Rural Broadband Initiative and Ultra Fast Broadband programmes, the synchronous tool should transition from a dedicated video conference system to Internet videoconference and other tools that support synchronous activities in a virtual classroom (e.g., Blackboard Collaborate [formerly Elluminate and Wimba], Adobe Connect, etc.). The VLN already provides Adobe Connect service and the VLN primary cluster's developments for language teaching are making promising use of this set of tools. Successful strategies should be promoted and profiled to spread their use.

Second the Ministry of Education should consider creating a central repository of asynchronous course content. At present, when a teacher is selected to teach a virtual learning course for one of the clusters they generally begin to populate their learning management system with course material they either create themselves or are able to find on the Internet. This is a substantial investment of human capital, and in many instances the teacher is not provided any additional time for the creation of this course content. As was discussed earlier, if two teachers in two different clusters were tasked with teaching the same course these two individuals would

undertake the process independent of each other – thus duplicating their efforts (or in the case of level three art history, six times the effort). The Ministry could work with champions to collect existing asynchronous course content from many of the existing e-learning clusters, combine the content from the same courses to create a master course that any cluster could then use.

The Ministry could further this development by contracting individuals to develop course content that may be missing from existing courses or for courses that have yet to be developed by the existing clusters. The reduction of removal of the burden to design all parts of a course and even whole courses could also enable clusters to engage more teachers in the virtual learning process, as one of the common impediments for attracting new eTeachers was a fear and burden of having to create asynchronous course content. Finally, the Ministry of Education could also provide this content to any school or teacher in the country, allowing classroom-based teachers to use the content with their students in a blended fashion.

The nationwide recommendation for the Ministry of Education is to consider the geographic coordination of virtual learning in New Zealand. The current group of ePrincipals, along with many of the principals and deputy principals from schools participating in the e-learning clusters, has agitated for the full funding of the cluster ePrincipals. However, to date these individuals have yet to make a business case for Ministry funding of one ePrincipal per e-learning cluster – particularly given the lack of vision for the role beyond that of a principal of an online school or project director for an e-learning initiative. A possible concession that would allow the Ministry to provide some support to the administration and coordination role that is genuinely needed for these initiatives to thrive and grow, while recognising the fact that full ePrincipal funding for what is equivalent to 10 to 100 full-time students it not feasible. The Ministry of Education could create five to eight larger geographic regions and fund a part-time or

full-time coordinator for each of these regions. Recognizing that the self-management of schools in New Zealand is a significant challenge, the specific responsibilities for this coordinator could be determined in conjunction with the VLN-C, but should include a rationalisation of the current geographic clusters and a specific delineation of what the responsibilities of an administrative leader of a virtual learning programme should include.

Future Research

Barbour and Reeves (2009) wrote that "there [had] been a deficit of rigorous reviews of the literature related to virtual schools" (p. 402), while Rice (2006) lamented that "a paucity of research exists when examining high school students enrolled in virtual schools, and the research base is smaller still when the population of students is further narrowed to the elementary grades" (p. 430). Cavanaugh, Barbour, and Clark (2009) indicated that most literature related to K-12 online learning was "based upon the personal experiences of those involved in the practice of online learning" (¶ 5), and in particular based on the experiences of online learning teachers, course designers, and administrators. Clearly there is a need for a systematic examination of primary and secondary virtual learning in all jurisdictions.

In addition to a general agreement that little research exist and there is a need for more to be conducted, there is also no shortage of suggestions on where those research efforts should be directed. For example, in their synthesis of eight quantitative studies into primary and secondary online learning funded by the North Central Regional Laboratory in the United States, Smith, Clark and Blomeyer (2005) recommended future research focus upon seven areas:

1. interpreting "equal of better' achievement findings;
2. understanding and improving student persistence;
3. instructional models that lead to student process skills;
4. issues related to student satisfaction and motivation;
5. identifying and remediating characteristics for successful online learning;
6. leveraging the features of online learning systems; and

7. discriminating online learning based upon a variety of educational contexts.

The following year in her review of literature focused on primary and secondary distance education, Rice (2006) recommended:

- Improve the quality of research that examines the critical components of learning directly related to younger learners.
- Continue and expand on the development of prediction instructions that help identify successful learner attributes.
- Develop organised student evaluation systems to facilitate consistent data collection.
- Investigate the relationship between student supports and at-risk student needs in relation to distance education.
- Investigate the social and cognitive aspects of distance education and the effect of knowledge construction.
- Develop valid and reliable tools for identifying interactive qualities in course design and instruction. (p. 442)

In other reviews of primary and secondary online learning Barbour and Reeves (2009) called for future research to focus on "factors that affect student success in virtual school environments" (p. 412); while Cavanaugh et al. (2009) recommended that researchers work to establish best practice for online teaching strategies, improve the identification and remediation of characteristics needed for success in the online environment, investigate how school-based teachers can support online learners and examine the student experience in online learning – particularly the lower performing student.3

Two countries that have a similar history with primary and secondary virtual learning as New Zealand are Canada and the United States. All three countries began their virtual learning journey about the same time (i.e., 1993 in Canada with the creation of New Directions in Distance Learning and the EBUS Academy, 1993 in New Zealand with the creation of the Canterbury Areas Schools Association Technology project, and 1994 in the United States with the creation of the Electronic High School in Utah). Virtual learning in all three countries also

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[3] Barbour (2010) provides an overview of the current state of research into primary and secondary online learning, along with a summary of these suggestions for future research.

had an initial focus on providing educational opportunities to students attending small, rural and remote schools – usually all grade or areas schools. All three countries have seen the development of multiple programmes providing virtual learning opportunities and that development has occurred in an uneven fashion (i.e., with some programmes thriving and others struggling). However, in Canada and the United States the differences in development were often due to the different regulatory regimes and government actions with individual provinces or states. These differing systems of regulation and actions gave rise to a series of annual reports that describe the policies and legislation governing primary and secondary virtual learning, along with the level of virtual learning activity, in each of the provinces and states (see State of the Nation: K-12 Online Learning in Canada4 and Keeping Pace with K-12 Online Learning [United States]5).

While there are no differences in how primary and secondary virtual learning is governed in New Zealand due to varying jurisdictions; there are multiple programmes, types of programmes, and legislative and policy regimes that affect the development of primary and secondary virtual learning in the country. One of the common themes from the researchers' interactions with those involved in the delivery primary and secondary distance learning was a fundamental misunderstanding and/or lack of knowledge of other providers within the New Zealand context. At the primary and secondary level, there are four main types of providers: the VLN e-learning clusters, Te Kura/The Correspondence School, the health schools, and some tertiary institutions. It is interesting to note the misunderstanding and lack of knowledge wasn't simply between individuals involved in one type of system as compared to another (i.e., someone from the VLN and their misunderstanding of Te Kura or someone from the health schools and

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[4] Available from http://virtualschool.wikispaces.com/canada
[5] Available from http://kpk12.com

their lack of knowledge of the VLN). The lack of knowledge also applied to the activities from

VLN e-learning cluster to e-learning cluster. Simply put, those involved in the provision of

primary and secondary distance learning often did not know much about the activities of their

colleagues, and currently there is no one source these individuals can consult to obtain that

information. It is for these reasons that it is recommend that before any systematic analysis of

primary and secondary distance learning can be conducted in an efficient manner, there needs to

be a better understanding of all aspects of the current systems.

A national survey of primary and secondary distance learning organisations would

include, but not be limited to the VLN e-learning clusters (along with other individual projects

using the VLN infrastructure), Te Kura/The Correspondence School, the health schools, and

those tertiary institutions providing secondary distance learning opportunities. The national

survey should examine the regulatory regimes that govern each of these groups (e.g., any

agreements e-learning clusters have to enter to use the VLN brokerage services, legislation

governing Te Kura and the health schools, etc.). The national survey should describe the level of

distance learning provided by each organisation, including information about enrollment,

completion rates, number of unique students, number of teachers, number of and which courses,

the method and medium of delivery for those courses, the hardware and software being used to

support he distance learning delivery, etc.. Finally, the national survey should identify trends

found within the data collected from the distance learning providers and make recommendations

to allow for a rationale growth of primary and secondary virtual learning in New Zealand.

Regardless of which specific path is chosen, it is important to remind researchers, policy

makers, practitioners, and all stakeholder of Blomeyer (2002).

> Online learning or e-learning isn't about digital technologies any more than classroom
> teaching is about blackboards. E-learning should be about creating and deploying

technology systems that enable constructive human interaction and support the improvement of all teaching and learning. (p. 19)

Regardless of the direction taken, the focus of future research should be on how to use online learning to improve teaching and learning at the primary and secondary level.

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