



**A Literature Review focused on Virtual Learning  
Environments (VLEs) and e-Learning in the  
Context of Te Reo Māori and Kaupapa Māori  
Education**

Report to the Ministry of Education

Sarah-Jane Tiakiwai & Hans Tiakiwai  
Kiore Enterprises Ltd

**ISBN: 978-0-478-34217-8**

**Web Copy ISBN: 978-0-478-34218-5**

**RMR-936**

**© Ministry of Education, New Zealand — 2010**

Research reports are available on the Ministry of Education's website Education Counts:  
[www.educationcounts.govt.nz/publications](http://www.educationcounts.govt.nz/publications).

Opinions expressed in this report are those of the authors and do not necessarily coincide with those of the Ministry of Education

**A Literature Review focused on Virtual Learning  
Environments (VLEs) and e-Learning in the Context of  
Te Reo Māori and  
Kaupapa Māori Education**

**Report to the Ministry of Education**

**Prepared by**

**Kiore Enterprises Ltd**

**Sarah-Jane Tiakiwai  
Hans Tiakiwai**





## TABLE OF CONTENTS

<b>EXECUTIVE SUMMARY.....</b>	<b>1</b>
Introduction.....	1
Findings.....	1
Does technology facilitate enhanced learning outcomes in kaupapa Māori environments? .....	3
<b>INTRODUCTION .....</b>	<b>6</b>
Background .....	6
Approach to the literature review – utilising a kaupapa Māori framework .....	6
A note on terminology .....	7
<b>TEACHING AND LEARNING PRACTICES ASSOCIATED WITH e-LEARNING AND VIRTUAL LEARNING ENVIRONMENTS (VLEs) .....</b>	<b>8</b>
Introduction.....	8
The learning environment .....	8
Relationships and communication in a digital environment.....	9
Collaboration .....	10
Pedagogy .....	11
Quality tools.....	12
Does technology facilitate enhanced learning outcomes?.....	14
<b>KAUPAPA MĀORI AND E-LEARNING .....</b>	<b>17</b>
Introduction.....	17
Cultural practices and e-Learning .....	17
Te reo Māori in e-Learning.....	18
Resourcing .....	19
Barriers to e-Learning .....	20
<b>E-LEARNING PRINCIPLES AND PRACTICES WITHIN INDIGENOUS EDUCATION CONTEXTS.....</b>	<b>23</b>
Introduction.....	23
Benefits of e-Learning .....	23
Teaching Practices.....	24
Creating learning opportunities through e-Learning.....	24
Challenges to cultural practices .....	25
<b>TEACHING AND LEARNING PRACTICES THAT APPEAR MOST LIKELY TO CONTRIBUTE TO ENHANCED LEARNING OUTCOMES FOR STUDENTS IN KURA KAUPAPA MĀORI .....</b>	<b>27</b>
Introduction.....	27
The importance of the learning environment .....	27
Quality relationships .....	28
Cultural understandings .....	29
Pedagogical challenges .....	30
Summary .....	30
<b>BIBLIOGRAPHY .....</b>	<b>31</b>



## **EXECUTIVE SUMMARY**

### **Introduction**

Over the last ten years there has been an increased emphasis on conceptualising, developing and implementing e-Learning initiatives across the New Zealand education sector (Report of the E-Learning Advisory Group, 2002; Ministry of Education, 2006; Tertiary Education Commission eCDF Initiative, 2003, are examples of such thinking and implementing). Included within these initiatives were calls for increased engagement by Māori in e-Learning and for schools and institutions to develop or participate in initiatives that would foster increased Māori engagement in the development of resources, and in teaching and learning incorporating these new technologies.

The Ministry of Education has identified the need to further explore the use of Virtual Learning Environments particularly in the context of te reo Māori and kaupapa Māori education. This literature review was sought to provide further understanding for the Ministry of Education in this area.

The literature review was guided by the following research questions:

1. What are the key understandings that emerge from an integration of the literature that has explored kaupapa Māori education (including te reo education) with the literature that focuses on e-Learning principles and practices within indigenous education contexts?
2. What are the key understandings that emerge from the literature on the emerging teaching and learning practices associated with Virtual Learning Environments (VLEs)?

And, drawing on the two preceding review sections -

3. What are the teaching and learning practices that appear most likely to contribute to enhanced learning outcomes for students in kura kaupapa Māori?

Because of the lack of literature which focused specifically on Virtual Learning Environments, the scope was broadened to include literature on e-Learning, digital technology and ICT. The literature on e-Learning in kaupapa Māori settings is also scarce, with much of the literature found focusing on evaluations of e-Learning initiatives implemented in kaupapa Māori settings. These kaupapa Māori settings included tertiary, school sector, and distance learning contexts. The literature review was guided by a kaupapa Māori framework to ensure that the literature found could be appropriately contextualised within kaupapa Māori environments.

### **Findings**

In reviewing the literature on teaching and learning practices associated with Virtual Learning Environments, the following themes emerged:

#### **1. The learning environment**

The literature identified the importance of creating an appropriate e-Learning environment. In particular, this environment needed to consider issues of time, space and place as well as how e-Learning could be incorporated into classroom teaching and learning practice. The creation of such a learning environment changed the way students or learners approached their learning. The literature

noted that the students in e-Learning environments often took greater control over or responsibility for their learning.

## **2. Relationships and communication in a digital environment**

The literature suggests that relationships and the way students and teachers interact and communicate change in a digital learning environment. As students take greater control over and responsibility for their learning in e-Learning settings, the relationship between the student and teacher changes, where the teacher becomes less of a teacher and more of a facilitator in student learning. The literature also suggests that teachers are often finding that they have to work harder to create relationships with their students because of the lack of face-to-face contact, although some of the literature noted instances where teachers still felt conscious of the need to create face-to-face opportunities beyond those initiatives that were already in place.

## **3. Collaboration**

The literature refers to the importance of collaboration for successful e-Learning on a number of levels. One level refers to collaboration as a teaching and learning practice, while another talks about how collaboration is a process of interaction and development between resources and participants or users of such resources. One further level, that is discussed here, refers to the importance of collaborative relationships – between and across communities, schools and institutions – to facilitate the provision of e-Learning services and products.

## **4. Pedagogy**

The literature identified that there was a lack of sound pedagogical knowledge relating to e-Learning. In particular, the literature suggested that emphasis in e-Learning was focused more on the technology, where professional development for teachers was often focused on learning how to use new technology rather than understand how the technology impacts on teaching and learning experiences. Some of the literature pointed to a need to address this concern with a greater focus on pedagogy in e-Learning.

## **5. Quality tools**

Well-designed tools were noted in the literature as playing important roles in facilitating schools', teachers' and students' engagement with e-Learning. According to the literature, the following themes were identified as impacting on how e-tools are designed and developed:

- a) general cultural and social expectations – this theme speaks to the importance of relevancy, where designers of e-tools require an understanding not only of who they are designing tools for, but also how their own cultural and social understandings and expectations may impact on their approach to design;
- b) teaching and learning expectations – this theme also referred to the impact that one's own background played in the design and development of e-tools. The literature warns against trying to homogenise experiences in the design process, as this impacts on the quality of the tool designed;
- c) differences in the use of language and symbols – more focused towards tools developed for use in cross-cultural contexts, this theme highlights challenges of mis/translating or

transferring knowledge forms into digital concepts. The literature stresses that quality tools can be impacted by the strength of cultural competence and understanding of the designer;

- d) technological infrastructure – while the literature acknowledged that e-Learning and advances in technology and e-tools were changing all the time, the ability of schools, classrooms, teachers and students to effectively utilise such tools was often dependent on technological infrastructure, such as reliable, available and cost effective access. Some of the literature also identified the relationship between the effectiveness of e-tools and their implementation in the classroom.

## **Kaupapa Māori and e-Learning**

The literature on e-Learning in kaupapa Māori environments was scarce. However, the literature that was found identified the following themes:

### **1. Cultural practices and e-Learning**

Literature relating to e-Learning and kaupapa Māori environments highlights the importance of incorporating Māori cultural practices into e-Learning. In particular, the literature suggests the inclusion of these practices, such as whakawhānaungatanga may facilitate better student engagement with the e-Learning process.

### **2. Te reo Māori and e-Learning**

The lack of understanding and knowledge about kaupapa Māori and e-Learning extends to understandings about the place and purpose of te reo Māori in e-Learning settings. The literature suggests that while kaupapa Māori settings stress the importance of incorporating te reo Māori into e-Learning environments, further research is needed to better understand how te reo Māori may be more appropriately incorporated into e-Learning.

### **3. Resourcing**

Access to appropriate resources for kaupapa Māori settings was a constant theme in the literature. The literature identified that teachers in kaupapa Māori settings were often having to develop or translate resources to ensure their suitability for the kaupapa Māori teaching and learning environment. Equally, the literature identified the importance of ensuring professional development for teachers to ensure greater use and understanding of new e-tools. From students' perspectives (particularly those at the tertiary level), the literature suggests that e-Learning environments create more flexible learning opportunities that may facilitate or support greater Māori student engagement.

### **4. Barriers**

The literature noted three key areas as barriers to e-Learning in kaupapa Māori environments:

- a) an over emphasis on content development as the centre of practice and under emphasis on context and learner experience – in particular, the literature stressed the importance of ensuring the appropriateness and relevance of tools and content designed to include aspects of Māori culture. The literature highlighted the impact of cost effectiveness on e-Learning, where a 'one-size-fits-all' approach often resulted in a lack of consideration for kaupapa Māori learning environments;

- b) a relative lack of evaluation in real-world practice – the literature highlighted the lack of emphasis placed on evaluating the effectiveness of e-Learning in schools and classrooms. This was also noted with the lack of professional development available to kaupapa Māori teachers to support their integration of e-Learning in their teaching and classroom practice;
- c) roles that designers assume in larger organizations – to a lesser extent, the literature identified that the role of designers, particularly those working for or contracted by large organisations, at times end up becoming separated or disconnected from the end users of the tools for whom they design.

The literature on e-Learning in indigenous contexts was not dissimilar to the kaupapa Māori section. Key themes emerging from the literature were:

### **1. Benefits of e-Learning**

One of the key findings in the literature noted that e-Learning removed physical barriers of distance for indigenous participation in education. E-learning also allowed flexible learning opportunities, where indigenous students were able to stay in more familiar social and cultural environments whilst pursuing continued and enhanced learning.

### **2. Teaching practice**

The literature suggests that effective teaching is critical to successfully incorporating e-Learning in indigenous communities. In particular, the literature noted the importance of teachers being aware of the impact – both negative and positive – that e-Learning can have on indigenous communities and indigenous knowledge forms.

### **3. Creating opportunities through e-Learning**

The literature identified e-Learning as being a positive and creative way for indigenous students and communities to engage with their cultural knowledge forms and practices. Examples were given as to how different e-Learning tools were able to support communities to reconnect (through internet websites) and to learn their language and customs (through the development and production of online learning resources).

### **4. Challenges to cultural practices**

The main concern identified in the literature about e-Learning was its potential impact on the preservation, use, and misuse of indigenous knowledges and practises. While e-Learning was seen as contributing positively to indigenous communities through facilitating more flexible learning environments, through reconnecting communities and so forth, the literature highlighted how e-Learning could also facilitate in alienating indigenous youth from traditional ways of accessing and acquiring indigenous knowledges and practices. Concern was also expressed about how e-Learning, as an initiative drawn from Western thinking, could impact negatively on indigenous philosophical approaches to learning.

The final section of this report synthesises the findings from the literature to suggest teaching and learning practices that appear most likely to contribute to enhance learning outcomes for students in kura kaupapa Māori. It should be noted that the paucity of literature around e-Learning in kaupapa Māori settings makes it difficult to state what contributes to enhanced learning outcomes. However, from the literature reviewed for this report, the following themes emerged:

### **1. The importance of the learning environment**

As noted, the importance of the learning environment has been identified in the literature as being a key factor in facilitating positive learning opportunities for students. This learning environment, particularly for kaupapa Māori environments, included the need to have access to good quality resources, professional development and support as well as a positive and appropriate physical learning environment. This included access to and availability of reliable internet and data connections, technical support and expertise and more support in pedagogical understanding of e-Learning in kaupapa Māori settings.

### **2. Quality relationships**

The literature identified that the creation of a physical environment was not enough in ensuring positive teaching and learning experiences in kaupapa Māori settings. Equally important was the need for quality relationships between teachers and their students.

### **3. Cultural understandings**

The ability for new technologies to appropriately incorporate te reo Māori and Māori ways of knowing and doing were seen in the literature as important in being able to engage Māori students in their learning. This included, for example, the importance of incorporating cultural practices of face-to-face learning or whakawhānaungatanga into e-Learning practice.

### **4. Challenges to pedagogical practices**

The literature identified that teachers in kaupapa Māori settings utilised e-Learning more in their teaching as they became more confident and familiar with how to use the tools and resources. However, the literature also noted that the lack of professional support available to teachers and the often ad-hoc way they adapted and implemented e-Learning in their classrooms (translating resources for example), hindered their ability to reflect or evaluate the effectiveness of their e-teaching practice. The need to explore the relationship between Māori and e-Learning pedagogies was also identified.

## INTRODUCTION

### Background

Over the last ten years there has been an increased emphasis on conceptualising, developing and implementing e-Learning initiatives across the New Zealand education sector. Andrews and Haythornthwaite (2007), in their introduction to e-Learning research, state that e-Learning is an emergent process which is viewed by some as a delivery mechanism and by others as a new pedagogical challenge. They suggest that “what that delivery looks like and what frames the pedagogical challenge emerges from the interplay between new educational strategies, new teaching approaches, new technologies and new participants in this endeavour” (p. 41).

The key questions underpinning this literature review reflect Andrews and Haythornthwaite’s (2007) statement above. Specifically, the questions informing this literature review seek to understand the interplay between these new technologies and teaching and learning approaches for kaupapa Māori education settings. The key questions guiding this literature review are:

1. What are the key understandings that emerge from an integration of the literature that has explored kaupapa Māori education (including te reo education) with the literature that focuses on e-Learning principles and practices within indigenous education contexts?
2. What are the key understandings that emerge from the literature on the emerging teaching and learning practices associated with Virtual Learning Environments (VLEs)?

And, drawing on the two preceding review sections -

3. What are the teaching and learning practices that appear most likely to contribute to enhanced learning outcomes for students in kura kaupapa Māori?

### Approach to the literature review – utilising a kaupapa Māori framework

According to Pihama and Penehira (2005), a kaupapa Māori approach ensures “a ‘home grown’ theoretical and research approach that interrogates and investigates issues as they are contextualised within Aotearoa” (p. 10). From this perspective, and given the scope of the literature review proposed by the Ministry of Education, it was felt that a kaupapa Māori approach was an appropriate framework from which to structure the literature review, in spite of criticisms as to the robustness and relevance of kaupapa Māori as a research theory and methodology (see for example, Rata, 2004).

The engagement of kaupapa Māori with e-Learning is a relatively new phenomenon. However Māori have had a long history of engagement with new technologies (ITPNZ, undated, p. 3). As Monte Ohia noted in his introduction as a member of the ITPNZ Project Māori Reference Group, kaupapa Māori “has both unchangeable and changeable elements that allow us to remain authentic to ahuatanga and tikanga Māori as well as participate in the modern world” (ITPNZ, undated, p. 3). From this position it is important to understand how e-Learning fits within the contextual and philosophical (or unchangeable elements as suggested by Monte Ohia) underpinnings from which kaupapa Māori as theory, methodology and pedagogy emerged. This ensures that the analysis of the literature is appropriately grounded and located. The rationale for this positioning has emerged from critiques of educational research by kaupapa Māori researchers such as Linda Smith (1999), Graham Smith (1997) and Russell Bishop (1996), who have argued that educational

research often ignores the reality of Māori educational experiences and fails to recognize the validity of Māori ways of knowing and doing. By establishing kaupapa Māori as the primary lens for the literature review, the literature pertaining to e-Learning was examined against *how* and *in what ways* literature pertaining to e-Learning may be appropriately or otherwise applied in kaupapa Māori learning environments.

### **A note on terminology**

The literature used to inform this review referred to e-Learning in a number of ways:

- e-Learning;
- digital technology;
- virtual learning environments; and
- ICT.

Andrews and Haythornthwaite (2007), in their introduction to e-Learning research, note that there are a myriad of terms and understandings that both encapsulate and distinguish different types of e-Learning practices. These terms and understandings have evolved from early notions of e-Learning technologies which were portrayed primarily as delivery mechanisms to incorporate learning management systems, computer-assisted technologies and the increasing “co-evolutionary nature of technology and its use” (Andrews & Haythornthwaite, 2007, p. 2). It should be noted that little literature was found which explicitly spoke about or referred to virtual learning environments, hence the literature search was broadened to include these other concepts of e-Learning. Recognising that e-Learning technologies are constantly evolving, the terms above have largely been used as they appeared in the literature to ensure the context in which they were discussed remains visible.

## **TEACHING AND LEARNING PRACTICES ASSOCIATED WITH e-LEARNING AND VIRTUAL LEARNING ENVIRONMENTS (VLEs)**

### **Introduction**

Andrews and Haythornthwaite (2007) state that educators have “long been appropriating technologies into the classroom” – where technology has evolved over time from pen and paper to the more technologically sophisticated tools that are becoming increasingly common in today’s classrooms (p. 6. See also Roberts, 2004; Schutte, 1997; Rogers, Graham & Mayes, 2007). This section of the report identifies some of the key themes that emerged from the literature reviewed around teaching and learning practice associated with e-Learning in general and virtual learning environments (VLEs) in particular.<sup>1</sup>

### **The learning environment**

The report of the E-Learning Advisory Group (2002) recognises that the new advances in technology are rapidly changing New Zealand’s learning environment. In spite of the “revolutionising” ways in which technology can assist in transforming learning, they acknowledge that:

Technology alone won’t achieve this transformation. What is also required is a shared vision of the kind of learning environment we want to create, with genuine representation of all cultures and communities. This is essential if we are to develop our own distinctive approach to e-Learning and use it, along with other approaches, to reflect and contribute to a collective New Zealand identity. (p. 11).

Creating the right learning environment was a common theme in the literature reviewed. A study of rural schools and their engagement with e-Learning by Stevens (2005) found that changes to traditional learning environments and approaches needed to be made because the creation of “open” or electronic learning environments effectively broke down barriers of space and distance, and required teachers to work more collaboratively often across learning sites (which were traditional classroom environments). Piccoli et al (2001) note that traditional learning environments are defined in terms of *time*, *space* and *place* and suggest that in e-Learning environments *interaction*, *control* and *technology* are additional dimensions that need to be considered (p. 403). According to Piccoli et al (2001), VLEs are “by definition open systems that allow for participant interaction” (p. 409). This type of interaction is important because it enables students’ greater flexibility and control over their learning. While acknowledging that traditional learning environments also provide for interaction, Piccoli et al (2001) contend that this is limited in comparison to VLEs which provide opportunities for ongoing and more extensive interaction between student and teacher.

Harlow et al (2008) suggest that the more flexible learning environment created by introducing technology in the classroom changes the role of the teacher, where they become more of a “facilitator of learning” (p. 57). In this environment, children are able to be more involved in their learning and the assessment of their learning, where the teacher provides guidance and facilitates the student to become more responsible for their own learning, a point noted by Chandra and Lloyd (2008). Piccoli et al (2001) refer to this as *learner control*, where students are able to control the level of instruction: reflective of the more flexible learning

---

<sup>1</sup> *It should be noted that in both this and subsequent sections, the literature includes tertiary, school sector, and distance learning contexts.*

environment that Harlow et al identified. From their study of laptop use by teachers, Harlow et al (2008) found that teachers were able to:

Select, modify and pace content to meet student needs and interests in a way that is impossible with written texts and whole class presentation. In the process of teaching, students were being guided to take responsibility for their own learning (p. 58).

Chandra and Lloyd (2008) found that students in their study were well aware of the differences between traditional and e-Learning environments and “seized the opportunity” to engage in the different spaces the e-Learning environment created for them (p. 1096).

### **Relationships and communication in a digital environment**

A study of rural schools and their engagement with e-Learning by Stevens (2005) found that the introduction of digital learning required changes to the ways students interacted with each other. Stevens (2005) stated that:

Many students experienced difficulty expressing themselves and, in particular, asking questions in open electronic classes when they did not know their peers from other small communities (p. 123).

As a result, teachers had to organise social occasions for students online to help students overcome this issue.<sup>2</sup> The importance placed on these social occasions enabled students to become “more comfortable with one another” and “inhibitions such as asking questions on-line were overcome” (p. 123). Piccoli et al (2001) concur, noting that “high levels of isolation, anxiety and confusion” can characterise the experience of students who participate in poorly designed VLEs (p. 409). Gilbert, Morton and Rowley’s (2007) study on student experiences of e-Learning found that students had varying levels of confidence in interacting with other students. Some of this lack of interaction was located around students’ confidence (or lack of) in posting to discussion threads, while others found discussion threads as a positive way of engaging with, and learning from, fellow students. There was also some adjustment required by some students who were still used to face-to-face feedback from tutors, which did not exist on their course.

Waiti (2005), Porima (undated) and the Institutes of Technology and Polytechnics of New Zealand (ITPNZ, undated) all identified the importance for creating opportunities for face-to-face interactions between and with tutors and students, even though they were engaged in online learning programmes. These Māori focused reports highlight the challenges that e-Learning faces in ensuring its relevance across a range of community and cultural contexts (New Zealand Council for Educational Research (NZCER), 2004). A series of workshops facilitated by ITPNZ found that participants considering critical success factors for Māori identified “direct human kanohi ki te kanohi” (p. 29) as one such key factor. Porima stated that the importance of this direct face-to-face contact was important because of the sense of “whānaungatanga” it created (undated, p. 10).

A report written by NZCER (2004) for the ITPNZ suggest that the establishment of relationships early in online programmes may facilitate better ongoing communication and engagement between students once the course is going. However, their report found that the effectiveness of students and teachers in establishing

---

<sup>2</sup> *As will be seen later in the report, the importance of organising social occasions was also noted in kaupapa Māori environments. However, these social occasions were often face-to-face wānanga or whānau meetings, stressing whakawhānaungatanga processes of kanohi-ki- te-kanohi meetings.*

relationships and better communication was also influenced by how well-designed systems and programmes were in supporting this approach.

## **Collaboration**

The literature refers to the importance of collaboration for successful e-Learning on a number of levels. One level refers to collaboration as a teaching and learning practice, while another talks about how collaboration is a process of interaction and development between resources and participants or users of such resources. A further level that is discussed here refers to the importance of collaborative relationships – between and across communities, schools and institutions – to facilitate the provision of e-Learning services and products.

### *Collaboration as a teaching and learning practice in e-Learning environments*

Much of the literature talked about the importance of collaboration as a teaching and learning practice in e-Learning environments (NZCER, 2004; McLoughlin & Oliver, 2000; Condie & Livingstone, 2007; Chandra & Lloyd, 2008). McLoughlin and Oliver (2000) state that the “community of inquiry” model is a useful epistemological framework from which to consider e-Learning because of its emphasis on collaboration, shared experience and participation. According to Condie and Livingstone (2007), and supported by Chandra and Lloyd (2008), this emphasis on collaboration impacts on relationships where power structures are altered as students become less reliant on teachers as their primary support for learning. As students are encouraged to take on more responsibility for their learning and teachers’ roles move more towards facilitation, Condie and Livingstone (2007) suggest that the implications of these changing roles is not yet fully understood:

The changes are not simple: they represent a fundamental change to the identity of the teacher and the student. This can be an uncomfortable experience, particularly for those holding fast to the ‘teacher-expert’ model. Such models are deeply embedded and the culture of schools often works against challenging well-established roles and practices. (p. 345).<sup>3</sup>

In kaupapa Māori settings, the shifting roles of student and teacher can be better understood in an ako Māori context, exemplified in a tuakana/teina type relationship.<sup>4</sup> While generally referring to relationships and responsibilities between younger and older siblings, the notion and application of tuakana/teina in kaupapa Māori education settings acknowledges the reversal of these relationships, “the complexities and inter-connectedness” of which are “key to understanding the way in which *ako* operates” (Pihama, Smith, Taki & Lee, 2004). Thus, while this might be viewed as a fundamental and potentially problematic change or shift in the ‘traditional’ student/teacher relationship, in kaupapa Māori settings, such shifts are considered a ‘normal’ part of cultural teaching and learning practice.

### *Collaboration as a process of interaction and development between resources and participants or users of such resources in e-Learning environments*

Wilson (2004) talks about the importance of collaborative action as a way of ensuring a “custom fit between the static resource and the immediate needs of individuals and groups” (p. 79). He suggests that these actions occur over time, and are influenced by who participates in the process and how the resources are moulded to suit the dynamics, purpose and functions of each individual/group action. Ham and Wenmoth’s (2007) evaluation of the Tertiary Education Commission eCDF initiative found that those initiatives that had a

---

<sup>3</sup> While some of the literature identifies this as a problematic notion, the lack of literature suggests that further research may assist in better understanding these changing relationships. For example, it could be argued that this type of relationship is already a core feature of kaupapa Māori schooling.

<sup>4</sup> Retrieved July 10, 2009 from <http://tereomaori.tki.org.nz/Te-reo-Maori-curriculum-guidelines/Teaching-and-learning-te-reo-Maori/Aspects-of-planning/The-concept-of-a-tuakana-teina-relationship>.

Māori focus were challenged by different expectations of the different strands that made up each of the groups. In particular, they noted:

Differences were apparent during the projects among educationalists who expected Māori pedagogy to drive the project, Māori development exponents who expected Māori worldviews to be the driver, and information technology (IT) technicians who wanted to get on with building IT tools and resources for Māori e-Learning. (p. 60)

Waiti's (2005) review of the effectiveness of *KAWM* noted that many of the e-teachers, as they grew in confidence and knowledge in e-Learning, began to get more adept at assessing the suitability and appropriateness of resources for use in online classrooms. However, as Gilbert et al (2007) highlight, in spite of Wilson's comments above, there is still a lack of understanding about quality standards for e-Learning resources.

### *The importance of collaborative relationships in e-Learning environments*

The E-Learning Advisory Group (2002) noted that "unbundling of services provides significant new opportunities which, given New Zealand's size, would benefit from collaborative approaches" (p. 12). The Tertiary Education Commission E-Learning Collaborative Development Fund (e-CDF), which was established in 2003, had the "specific purpose of building the e-Learning capability of the tertiary education system through a series of contestably funded collaborative projects".<sup>5</sup> The evaluation of the first round of projects funded through this initiative indicated that cross-institutional collaboration of the nature and form envisaged by the E-Learning Advisory Group, while not common, was occurring across the tertiary sector particularly amongst institutions of similar type (Ham & Wenmoth, 2007, p. 74). Ham and Wenmoth (2007) noted that the nature of collaboration across institutions was more in the form of projects that focused on information sharing rather than formal institutional alignments.

## **Pedagogy**

The E-Learning Advisory Group (2002) reported that successful e-Learning is dependent on "sound pedagogical approaches" (p. 6. See also Bolstad & Gilbert, 2006; Condie & Livingstone, 2007). This view was shared by Marri (2007) and Ham and Wenmoth (2007) who found that in spite of increased communities of practice being formed as a result of the Tertiary Education Commission e-CDF initiative, nationwide understanding of the pedagogy of e-Learning was "spread thinly" (p. 98). The literature also talked about the importance of sound pedagogy, but noticed that initiatives or professional development in ICT, e-Learning and new technologies were more focused on the technology itself rather than the pedagogy (NZCER, 2004; Bolstad, 2004; Trewern & Wenmoth, 2008).

What is increasingly being found is that strategies for instruction in e-Learning environments require consideration of the dominant knowledge forms in which e-Learning is grounded and from which it is developed. Rogers, Graham and Mayes (2007) state that this is particularly evident in international, cross-cultural settings where mis/understandings can reduce or enhance the usefulness of digital technologies. They note that instructional designers, who are responsible for developing educational content and experiences contained in e-Learning programmes, "are not immune from the influence of their own cultural blinders" and suggest that the often taken for granted assumption that Western knowledge is a useful grounding for instructional designers may not always apply in an increasingly global environment (p. 198).

---

<sup>5</sup> [www.tec.govt.nz/templates/standard.aspx?id=755](http://www.tec.govt.nz/templates/standard.aspx?id=755).

However, Raza and Murad (2008) suggest that the technological developments that have occurred over the last couple of decades has created “new social structures of knowledge creation and knowledge transmission” where time and space are no longer restrictors, thus creating a “new wave of democratisation” (p. 39). They advocate an epistemological pluralism, where “no methodology of knowing the world has an a priori supremacy over the other” (p. 40). While there are perspectives in the literature that agree that e-Learning is reflective of the emerging dynamics that contribute to the knowledge society (Roberts, 2004; Wild & Henderson, 1997), Marri’s (2007) reflection of the impact of technology on education cautioned against this optimism, noting that educational reformers have “traditionally turned to new technologies and machines when confronted with failing schools, ineffective teachers, low test scores, or some other threat to the quality of education” (p. 144).

One of the common themes emerging from the literature was the need for better linkages between teachers use of and training in new technologies alongside some professional development in the pedagogy of e-Learning (Trewern & Wenmoth, 2008; Ham & Wenmoth, 2007; Bolstad, 2004; NZCER, 2004). Until this happens, it would appear that the effectiveness of e-Learning in classrooms will remain variable.

### **Quality tools**

The E-Learning Advisory Group (2002) stated that effective e-Learning needed to ensure “on-line resources and assessment are of equivalent or superior quality to those available in a traditional learning environment” (p. 15). According to the Ministry of Education (2006) the effective use of “well-designed digital content across a broad range of learning activities” has a positive effect on student engagement and learning outcomes” (p. 14. Cited in Trewern & Wenmoth, 2008, p. 27). The relationship between well-designed digital tools and resources with schools engaging in e-Learning was also noted in the literature. Drawing on the findings of their study, based on interviews with instructional designers and people involved with educational technologies, Rogers, Graham and Mayes (2007) identified four key themes:

- a) general cultural and social expectations;
- b) teaching and learning expectations;
- c) differences in the use of language and symbols; and
- d) technological infrastructure.

#### *General cultural and social expectations*

In regards to general cultural and social expectations, one of the respondents in Rogers et al’s (2007) study emphasised the importance of sensitivity and responsiveness as ways of managing perceptions, roles and relationships; in understanding the effect of enculturation; the influence of socio-economic status, and the political climates and instabilities of the countries in which the learning environment was located. Most importantly, it was felt that instructional designers needed to be aware of:

General cultural and social expectations in order to make the materials very relevant to the learners, to make it possible for them to use their life experience...and their everyday life environment. (p. 203)

The experiences of Te Wānanga o Raukawa in piloting an ePortfolio software programme, *Mahara*, suggests that when cultural and social expectations are managed and incorporated in relevant ways for learners, such tools can complement culturally specific learning approaches. Underwood (2007) describes the piloting of

*Mahara* across Te Wānanga o Raukawa as successful because it was able to be used within the culturally unique learning environment that existed at Te Wānanga o Raukawa. Underwood explained that its success was because Te Wānanga o Raukawa was “committed to the use of eLearning technologies...that support our kaupapa” and that *Mahara* contributed to “pūkengatanga (skill base) and whānaungatanga (shared purpose)” (p. 9).

### *Teaching and learning expectations*

According to Rogers et al (2007), teaching and learning expectations are “influenced deeply by culture” (p. 204). One of the key issues emerging for the instructional designers was the need to be more aware and sensitive about what assumptions they could or could not make about teaching and learning, particularly when working in cross-cultural learning settings. They identified a range of skills that instructional designers might consider to make “wise decisions” particularly when creating cross-cultural learning programmes. These skills included a deeper understanding of cultural expectations concerning the teacher-student relationship and roles and understanding about creating ideal classroom environments and types of activities for engagement. Bolstad and Gilbert (2006) suggest that there is also a need for these ‘wise decisions’ to consider assumptions about the “digital generation” – where “generalisations...to homogenise young people” implies that they all think and act in the same way (p. 6).

### *Differences in the use of language and symbols*

For indigenous communities, particularly those where there is no written tradition, concepts and understandings of language are particularly difficult to transfer into digital environments. Similarly, the use of symbols and colours in cross-cultural digital environments were not always easily transferable. Rogers et al (2007) state that because this was such a complex area for their participants, “language took a prominent role in their thinking” because they found that language and language structure could influence the way in which people think; that even when English was used in cross-cultural instructional design, it was important that instructional designers remember that not all understanding of English was equal; and misuse of language, symbols, colours, metaphors could potentially, even if unintentionally, create offence for learners. Because of this, cultural competence for designers was identified as being critical. Given this context, perhaps consideration could be given to how different cultures are included and positioned on websites which target multiple cultures. For example, the *WickED* website included English, te reo Māori and Pasifika languages – however while students were given a choice of entering the site through either the English or te reo Māori versions, the Pasifika students could only engage via email in a range of Pasifika languages once they had entered through the English or te reo Māori versions of the site (Trewern and Wenmoth, 2008). While Trewern and Wenmoth (2008) did not consider the impact this positioning had on the Pasifika children who accessed the site, or assess whether the limited language options discouraged greater use by Pasifika children (which was not the focus of their study), their finding suggests that more work needs to be done to consider the importance of cultural competence and understanding by instructional designers in the New Zealand context.

### *Technological infrastructure*

The impact of technological infrastructure on digital learning environments was often dependent on and impacted by issues such as speed, accessibility, cost and reliability (Gilbert et al, 2007; Ham & Wenmoth, 2007; Waiti, 2005; Bolstad, 2004; Parr & Fung, 2000). Rogers et al (2007) emphasised how important it was for instructional designers to recognise limitations facing different learning communities - in settings where ‘technology’ was still seen as pen and paper, but also in settings where understandings about and confidence in engaging with technology were still limited. Investing in infrastructure was one of the objectives of the Tertiary Education Commission E-Learning Collaborative Development Fund (e-CDF), which focused on

building capability that would support tertiary organizations' ability to deliver e-Learning education programmes (Ham & Wenmoth, 2007). In their evaluation of this initiative, Ham and Wenmoth (2007) found that there were varying levels of infrastructural capability, noting that most of the larger tertiary institutions found infrastructure as less of a barrier to learner access than smaller private training organizations (p. 96). They noted that this was potentially an issue, creating a them-and-us scenario, where smaller institutions who did not have the resources to be able to offer the same levels of e-Learning capability as larger institutions which was further exacerbated by financial resourcing constraints.

Financial resourcing constraints were also evident at the school level. Waiti's (2005) review of the *Kaupapa Ara Whakawhiti Mātauranga (KAWM)* initiative, which had upgrading of school ICT infrastructure as one of its objectives, found that in spite of technological problems, the upgrading of school ICT infrastructure led to improved processes and opportunities for students to interact with ICT. However, Waiti (2005) found that resourcing, particularly in the areas of expert technical assistance to support ongoing maintenance and development of their ICT infrastructure, would be an ongoing issue for the schools. Similarly, Bolstad and Gilbert (2006) identified infrastructure as a key principle in ensuring the effectiveness of technology programmes and initiatives in schools. They too recommended the need for expert knowledge particularly to support schools in making wise decisions around investing in equipment and software. Both reports talked about cost as being a huge factor in being able to provide or engage in e-Learning activities.

An additional factor to consider, particularly given the pressure for schools to move towards greater integration of technology, was whether the costs such infrastructure incurred resulted in increased students achievement. Parr and Fung's (2000) literature review on computer assisted learning in relation to literacy and numeracy identified that little has been done to calculate the efficiency of technology and programmes against the gains (of increased student achievement). However, there was acknowledgement in the literature that the programmes reviewed were expensive and the return in terms of achievement was questionable. The authors recommended further research to explore this issue.

### **Does technology facilitate enhanced learning outcomes?**

Much of the literature reviewed for this report identified how technology *enhanced* or *supported* student engagement in learning, with fewer studies reporting on how technology *facilitates* student achievement or contributes to enhanced learning outcomes. Interestingly, many of the studies reviewed noted that schools, institutions, teachers and principals talked about *positive shifts* in student achievement, where these shifts were noted largely through anecdotal examples of *increased* student engagement (and confidence) in technology. Condie and Livingstone (2007) suggest that this increasing emphasis on the potential for e-Learning to improve learning and attainment is more positively viewed by policy makers than academics, perhaps in response to policy shifts which are increasingly expecting students to acquire and gain competency across a range of technologies. Piccoli et al (2001) noted that while there is an increasing body of literature which suggests that "technology-mediated learning environments" may facilitate student achievement, they caution that these environments are successful only insofar as students are comfortable with and have the confidence to engage with the technology itself (p. 403). They also note that success is also dependent on the reliability and quality of the technology (p. 407).

There is some literature which suggests that technology facilitates learning in that the more comfortable students were with using technology, the more focused they became on the learning *content* as opposed to the tools. Harlow, Cowie and Jones (2008), in their study on the impact of laptops on teaching and learning in the classroom, found that the more comfortable children were with technological tools (such as computers,

digital cameras and so forth) the more able they were to focus on content of what they were learning rather than the technology itself (p. 52).

However, Schutte (1997) cautions against attributing student *achievement* to virtual learning environments. In his examination of the difference between traditional versus virtual learning environments and its effect on student performance on a university course, Schutte (1997) found that high levels of peer interaction amongst peers across both the traditional and virtual learning environments was a key component in their performance. However, he suggested that for the virtual learning students, these high levels of peer interaction:

Stemmed from the inability to ask questions of the professor in a face-to-face environment. I believe this lead paradoxically to student compensation evidenced by more involvement between and among peers, who formulated study groups to “pick up the slack” of not having a real classroom. (unpaged)

Similarly, Bolstad’s (2004) evaluation of the Notebook Valley project cautions against confusing shifts in students’ ICT skills, confidence and increased engagement with ICT with actual student achievement. Bolstad (2004) found that while there was qualitative data to suggest student improvements in their achievement, the standard assessment examinations and tests proved inconclusive. Waiti (2005) also noted that principals and teachers involved in the *KAWM* project talked about the contribution ICT had made to improved student achievement without specifying exactly where and how this achievement had occurred. Waiti (2005) found that this inability to isolate ICT as a contributing factor to student achievement was complicated by the schools’ use of multiple tools (of which ICT was one) for teaching and learning. However, because ICT was such an integral part of the schools’ lives, without it “students’ learning would effectively be negatively affected” (p. 65).<sup>6</sup>

Bolstad (2004) concluded that rather than having a significant impact on achievement, integration of ICT in schools through student use of laptops, instead, was seen as “having the potential to enhance students’ learning experiences” (p. 83). Further, the literature suggests that there is a “shifted focus away” from measuring student learning outcomes, to a more concerted approach that examines elements in the teaching and learning situation that “affect *whether* and *how* ICT might impact” on student learning and achievement (Bolstad, 2004, p. 9). Waiti (2005) gives a good example of how principals described the impact technology had in their schools, where students gained more confidence in and were more open to practise the skills they had gained, “with one citing increased length of written work ‘from some reluctant students, from two lines to a page, its nice and easy’ ” (p. 82). Acknowledging that the aim of *KAWM* was to increase student achievement, Waiti (2005) noted that many schools had not set up ways of being able to measure these shifts before the project started, hence the reliance on anecdotal evidence. This suggests that future studies or projects which link technology to student achievement need to find reliable ways of being able to record and report on such shifts.

Chandra and Lloyd’s (2008) attempts to examine the relationship between ICT and student achievement highlights the difficulties raised by Bolstad (2004), Waiti (2005) and Schutte (1997). Chandra and Lloyd (2008) posit that it is difficult to isolate e-Learning from other potential variables and the “drawing of

---

<sup>6</sup> *It could be suggested however that, in theory, the removal of ICT from schools may not necessarily lead to the negative effect on students’ learning once beyond the initial ‘withdrawal period’ of the ICT resources as Waiti found. It may require a reconsideration of teaching and learning in classrooms and is also dependent on the extent to which students and teachers had utilised ICT in their classrooms, what types of and the extent to which ICT tools were being used in classrooms and so forth.*

simplistic conclusions” masks the “complexity” that exists in e-Learning environments (p. 1096). The assessments of the students found that some students did not respond well to the e-Learning environment and others who did respond well to the environment did not report positive shifts in their assessment. While Chandra and Lloyd (2008) found improved student learning, they cautioned that this could have arisen from the “renewed enthusiasm” of staff and students or the Hawthorne effect of being engaged in a research project (p. 1096). Conversely, they also noted changes in classroom dynamics and teacher pedagogy, where the teacher shifted away from instruction to mentoring which was received positively by students.<sup>7</sup>

---

<sup>7</sup> *The changing relationship between student and teacher is also discussed on p.6.*

## **KAUPAPA MĀORI AND E-LEARNING**

### **Introduction**

The E-Learning Advisory Group (2002) acknowledged the importance of recognising the unique position within New Zealand education, where:

It is a priority to develop Internet resources and other digital material that reflects both Māori culture and values and supports Māori aspirations into the 21<sup>st</sup> century. (p. 5)

They advocated that in order for New Zealand to “forge its own e-Learning vision” it was important to ensure such a vision included a “confident indigenous dimension” (p. 19) and recommended:

That the Government recognises its responsibilities under the Treaty of Waitangi to ensure that Māori participate equally at all levels of e-Learning and, in particular, encourage:

- establishment of a Kaupapa Māori group to work with Kaupapa Māori-based programmes using e-Learning;
- development of Internet resources and other digital material for a Māori audience;
- research into key areas of Māori development in the field of e-Learning; and
- professional development for Māori tertiary practitioners. (p. 8)

In 2003, the Tertiary Education Commission established the E-Learning Collaborative Development Fund (eCDF), which had the specific purpose of building the e-Learning capability of the tertiary education system through a series of contestably funded collaborative projects.<sup>8</sup> One of the objectives of the eCDF was to deliver e-Learning that improves education access and quality for learners. In the evaluation of some of the projects funded through eCDF, it was identified that:

E-learning within the Māori community is seen as a ‘leveller’ and, in particular, a way to enable learning to take place for Māori communities in remote areas. (Ham and Wenmoth, 2007, p. 60)

From the literature found on Māori and e-Learning, common themes that emerged and which are discussed in this section included the importance of cultural practices and pedagogies, resourcing and barriers.

### **Cultural practices and e-Learning**

NZCER (2004) stated that one of the challenges for making e-Learning more learner centred was finding ways in which courses could be tailored to acknowledge and reflect “local needs, cultures, and contexts” (p. 66). For Māori students, Porima’s (undated) report on critical success factors for Māori learners in e-Learning environments found that tikanga Māori processes, such as whānaungatanga, were important. Porima noted that some Māori learners, while acknowledging that they were engaged in e-Learning and online learning environments, still stressed the importance of being able to incorporate Māori cultural concepts such as kanohi ki te kanohi (face-to-face) interactions.

---

<sup>8</sup> [www.tec.govt.nz/templates/standard.aspx?id=755](http://www.tec.govt.nz/templates/standard.aspx?id=755).

The findings of the *KAWM* initiative (Waiti, 2005) reinforce the importance of incorporating cultural practices into e-Learning programmes. Waiti (2005) found that the schools understood the importance of whānaungatanga to establish and develop relationships between students and teachers to effectively support students in their learning. Hui were held at the beginning of each year and at different points through the year to bring together teachers and students to ensure this support was provided on an ongoing basis. This type of relationship building was supplemented by other inter-school events. Partly this approach was initiated because of concerns about how video-conferencing was not suiting student needs. However, Waiti also noted that some e-teachers also considered e-Learning as not always being enough:

Another e-teacher was so concerned about having a relationship with her online students that she arranged weekend meetings with them throughout the year where mostly she traveled to them. This way she was able to meet the students' whānau as well. (p. 27).

This e-teacher felt that this was the only way to ensure they remained an effective teacher.<sup>9</sup>

NZCER (2004) reported on the findings of Campbell and Hawkesworth's (1999) study of the Mixed Media Programme (MMP) run at the University of Waikato, School of Education. What they found was that while most of the coursework was done at a distance, face-to-face meetings were a "vital component of the course's success" (p. 47). However, the online component of the programme also created for both the teachers and the students a strong sense of community – where teachers commented that they got to know their online students better than the ones they taught face-to-face. Additionally, NZCER (2004) note that Campbell and Hawkesworth (1999) found that incorporating more "relevant and real situations where Māori students can bring the reality of their community into the virtual classroom" was seen as being an important and effective way of incorporating Māori cultural knowledges into e-Learning environments (p. 47).

## **Te reo Māori in e-Learning**

There was scant literature which focused on te reo Māori specifically in relation to e-Learning. While initiatives such as the *WickED* website identified the inclusion of te reo Māori resources and the capacity for students to enter into the site through the medium of te reo, there was little evidence of how effective this incorporation was to Māori students who accessed the site (Trewern & Wenmoth, 2008).<sup>10</sup>

The E-Learning Advisory Group (2002) highlighted five principles which they felt should underpin New Zealand's e-Learning strategy. One of these principles, the Protection principle, made reference to te reo Māori and an example of how this principle could be put into practice suggested resourcing the development of Learning Objectives in Māori language (p. 18). The challenge of incorporating this type of objective into initiatives with a focus on te reo Māori was that the issue of resourcing (as discussed below) is an ongoing struggle for kaupapa Māori learning environments across the education sector. Another challenge was being able to reconcile resources in te reo Māori that dealt with topics that were viewed as quite traditional in

---

<sup>9</sup> *It should be noted that this was the approach of one teacher who, in spite of acknowledging the benefits of e-Learning, also grappled with how to provide a culturally responsive and appropriate way of approaching their teaching and learning in an e-Learning environment. While it was an isolated example, it points to the ongoing tension that may exist for those in kaupapa Māori schooling environments – that being the tension of providing quality education (through the provision of a range of curriculum subjects often not available to kura) and the need to provide quality education in culturally appropriate and responsive ways.*

<sup>10</sup> *Trewern and Wenmoth (2008) acknowledge the difficulty they had in engaging kura kaupapa Māori as participants in their evaluation of WickED, which may explain why the lack of analysis pertaining to the Māori elements of the website.*

nature, which raised questions about whether digital environments were appropriate forums to house such knowledge (NZCER, 2004).

However, there were some examples of how te reo Māori could be effectively incorporated into programmes that met course requirements and Māori student aspirations. Campbell and Hawkesworth's (1999) study on the effectiveness of the Mixed Media Programme (MMP) at the University of Waikato found that offering online courses in te reo Māori and tikanga Māori "recognized and valued Māori students knowledge" whilst also providing levels of support for students who were second language learners of te reo Māori (NZCER, 2004, p. 46). Another initiative, through Te Wānanga o Raukawa's engagement with the Tertiary Education Commission eCDF project found that while seen as a "good start", it still had some way to go in being able to embed e-Learning practices with greater effect for Māori users (Ham and Wenmoth, 2007, p. 60).

## **Resourcing**

The importance of access to appropriate resources, especially those suitable for immersion Māori learning environments, was noted in the literature (Waiti, 2005; Ham & Wenmoth, 2008; May & Hill, 2005). As discussed earlier, designing resources which consider cultural relevancy can be challenging if teachers or designers themselves do not consider their own cultural biases (Rogers et al, 2007; NZCER, 2004). Ham and Wenmoth (2008) noted that the inclusion of a Māori character, Wiki, as one of the hosts on the *WickED* website was done to invite students to "consider who they were and their heritage" (p. 2). Additionally, the website allowed students to enter the site in te reo Māori and included interactive features based on Māori cultural activities. One example, based on the hangi, was seen as being reflective of the initiative's attempt to be more inclusive of other cultures and languages. Ham and Wenmoth (2008) noted the positive impact the initiatives contained within the *WickED* site had for Māori students who accessed the site. However, resources of this type are still relatively rare in kaupapa Māori schooling environments.

Teachers in immersion Māori settings constantly battle to find resources appropriate for their classrooms, often having to translate resources into te reo Māori or create their own. This issue was exacerbated for the e-teachers in the *KAWM* study:

Teachers teaching a new subject will always have to spend time gathering and judging the merits of resources prior to their use, and this is the case whether teaching online or conventionally. Similarly, if the resources have to be translated into te reo Māori for the first time, this is an issue whether teaching conventionally or online. The issue for online teachers was that they had these demands alongside that of planning and implementing online lessons. (Waiti, 2005, p. 20)

To get around this, schools and teachers engaged in *KAWM* looked at sharing resources through video recording lessons and placing them in digital banks. One of the schools had also looked at establishing a unit to produce resources to allow teachers to "concentrate on teaching" (p. 20).

The lack of resources suitable for Māori immersion environments extended to the provision of technical support and advice. Again, the *KAWM* initiative highlighted the innovation of the participating schools in addressing these shortcomings. As the initiative focused on cluster environments, the schools were able to develop a cluster of e-teachers as potential sources of advice for other teachers – both within and across the wharekura cluster. Waiti (2005) noted that these schools saw a "strong, supportive community of wharekura e-teachers developing" as a result (p. 24).

In spite of these innovations, the schools reported that the continuing effectiveness of such strategies and initiatives is dependent on the provision of ongoing support and professional development. As the number of

e-teachers with familiarity in the wharekura environment was small, Māori immersion e-Learning environments face issues of critical mass – placing stress on already stressed teachers (Waiti, 2005).

The literature identified that students also faced challenges in being able to utilise the resources available to them. For example, students did not always receive adequate training in how to use the resource and were sometimes constrained by not having access to basic tools (such as internet connection) at home (Porima, undated). NZCER (2004) also noted the impact of cost on Māori students having consistent and reliable access to an internet connection. NZCER noted that this is one of the issues of online programmes, which “assume” that students have ready access to computers and phone lines (p. 63). However, Porima also identified Māori students who found that online learning and being able to download resources at home helped them to manage study expenses and class resources. In this context, students considered the overall cost of having to leave their home environment which for some students required relocating families (and moving away from family support structures) and having to find – often more expensive - accommodation and transport.

### **Barriers to e-Learning**

Literature has identified the importance of culturally responsive teaching and learning contexts for Māori students (Bishop et al, 2003). Rogers, Graham and Mayes (2007) have also identified that designers of e-Learning programmes need to be cognisant of culture and assumptions about culture in the work that they do. Specifically, they identified three key barriers to being more culturally responsive:

- a) an over emphasis on content development as the centre of practice and under emphasis on context and learner experience;
- b) a relative lack of evaluation in real-world practice; and
- c) roles that designers assume in larger organizations.

Rogers et al (2007) found that instructional designers were more often focused on content development, designing programmes following a “one-size-fits-all” approach which ignores the different realities and contexts of the learner and creates a disconnection between the designer and their product and the learner, the end-user of the product (p. 207).

Another challenge to e-Learning was how teachers could evaluate the effectiveness of the tools and programmes they were teaching and utilising in their classrooms. The findings of the *KAWM* project suggest that professional development was a key issue for them, as was the development of sufficiently skilled staff – who were proficient not only in curriculum subject content as well as te reo Māori (which was already a significant challenge for Māori immersion schools) – but who were also skilled in e-Learning pedagogy and teaching.

Designers were also at times constrained by the organizations they worked for. Rogers et al (2007) noted that designers were often hamstrung in what they could and could not do as they were often required to fulfil organizational objectives when designing new tools. There was also a devaluing of the role and function of these designers, where designers were often relegated to technical support roles for teachers and being expected to design programmes for teachers to teach to students with little or no input into or feedback from students’ expectations and learning styles. This isolation from the learners and learning environment for whom they are designing creates further disconnections and, from the designers perspectives, creates questions about the cultural and pedagogical relevance of their work.

Student feedback from the *WickED* initiative, for example, highlights how such input might result in a more effective and user-friendly resource. Trewern and Wenmoth (2008) noted that the hosts of *WickED* were reflective of the cultures the site was hoping would be attracted to the site: Pākehā, Māori and Pasifika. While there was a colour distinction between the hosts (where the Māori host, Wiki, was noticeably brown), students reported that they didn't like that the hosts were faceless. Trewern and Wenmoth (2008) note that students reported initial concerns that something was wrong with their computer or computer connection (as explanations for why the details of the faces could not be seen). Because there was no accompanying background information about the hosts and their purpose for being included on the site, students felt that the faceless concept was "odd" (p. 13).

The experiences of these instructional designers suggest that consideration needs to be given to the total learning experience – from concept, design to development and implementation and evaluation. Teachers' use of curriculum materials (note that these were written documents, not e-Learning materials), in Pāngarau for example, was hindered because the curriculum document itself was merely a translation of the Maths curriculum document and therefore did not reflect or have relevance to Māori cultural understandings of Pāngarau; and was difficult to apply in the diverse Māori-medium settings that exist in New Zealand (Bishop and Tiakiwai, 2002). While the E-Learning Advisory Group suggested that an inability to provide more culturally relevant and responsive e-Learning possibilities for Māori resulted in a lack of engagement by Māori, the NZCER (2004) report notes that the lack of data and research around the Māori experience generally makes it difficult to support the assertion of the Advisory Group. While not dismissing the position of the Advisory Group, the caution by NZCER highlights that much is still unknown about Māori experiences in e-Learning.

#### *Strategies to overcome these barriers*

The participants in Rogers et al's (2007) study identified several strategies to help overcome the barriers discussed above. Using the "building bridges" metaphor, these strategies talk about the importance of separating deeper principles from particular applications; identify how bridges can be built to traverse the gaps barriers have left; allow for more flexibility in the design process; and educate other stakeholders so they too engage in the bridge building process (p. 210). Rogers et al (2007) state that the building bridges concept is:

Associated with being more aware and flexible to the possibility that your own conception of things (e.g., time and schedules, rules and relationships, social and educational expectations, and so on) is not the only view that exists and is valid. The key...lies in finding where the key differences in the current expectations and abilities of learners from different cultures are, and then bridging those gaps through such things as the additional support needed to be successful with the instructional experience at hand. (p. 211)

The evaluation of the *WickED* website by Trewern and Wenmoth (2008) stressed the need to ensure that cultural groups such as Māori and Pasifika be included in any future e-Learning frameworks to be developed. While it was acknowledged that Māori and Pasifika students did not access the website as regularly as Pākehā students, this was insufficient reason to not ensure more inclusive content. As noted earlier, the inclusion of the interactive resource on hangī on the *WickED* website was seen as a positive initiative in that it not only provided a space for Māori children to see and have acknowledged their culture, but it also exposed Māori cultural practices and knowledge to wider audiences. This approach received positive feedback from students who accessed the website (Trewern & Wenmoth, 2005).

As noted, Condie and Livingstone (2007) suggest that policy makers have played a critical role in advancing e-Learning. May and Hill (2005), in their review on Māori-medium education, found that many Māori-medium initiatives and programmes were often developed “*ad hoc*...often with little knowledge of, or consistency in appropriate pedagogical approaches” (p. 394). They acknowledge that much of this development has usually been at the instigation of whānau and/or communities, which in effect is reflective of how Māori immersion movements such as Kōhanga Reo and kura kaupapa Māori evolved. While not admonishing the developments whānau and communities have made in the pursuit of kaupapa Māori education, May and Hill (2005) caution that such initiatives may end up being counterproductive if they are not carefully developed and implemented. One of the challenges highlighted by the *KAWM* initiative is that such careful development and implementation is difficult to achieve when teachers and schools are often faced with external pressures by government agencies and policy makers to make educational shifts in ways which also at times might appear contrary to whānau aspirations (Waiti, 2005, p. 122). It would seem that these settings are constantly building bridges to manage these tensions.

## **E-LEARNING PRINCIPLES AND PRACTICES WITHIN INDIGENOUS EDUCATION CONTEXTS**

### **Introduction**

NZCER's (2004) section on e-Learning and indigenous peoples is a useful synthesis of the literature and initiatives pertaining to indigenous peoples' experiences with e-Learning. The two themes identified in their report: benefits of e-Learning and barriers to access and participation were consistent with the findings from other indigenous literature reviewed for this report and are useful frames for this section. NZCER (2004) drew most of its literature on e-Learning and indigenous peoples from the experience of Australian Aboriginal<sup>11</sup> peoples which, while useful, provides a limited perspective and understanding of how e-Learning has impacted on and is perceived by indigenous communities. This section has located a small selection of other indigenous peoples' experiences which reflect the findings of the NZCER report. However, it illustrates the dearth of research in this area thus preventing the ability to make or posit any conclusive statements.

### **Benefits of e-Learning**

Similar to the Māori experience, indigenous peoples are torn between the perceived benefits that e-Learning can provide and what barriers it might create. The NZCER (2004) report identified that much of the literature on the Australian Aboriginal context was focused on addressing low participation rates by Aboriginal communities in higher education. It was noted that e-Learning was able to break down "the tyranny of distance" that hindered remote Aboriginal communities from accessing higher education (p. 56). NZCER (2004) also identified that e-Learning enabled Aboriginal students with more flexible learning options, which meant that work or family commitments were in some cases better managed because of the flexible learning environment that e-Learning created. Wall (2008) acknowledged that the "utility of computer-mediated communication" which allowed Canadian Aboriginal students to continue studying at home "in a familiar social context while able to link electronically to other Aboriginal communities and institutions" supported not only student learning and engagement, but the ability for communities to capacity build without losing their students to larger cities and campuses (p. 74).

Scott (2006) found in her study of Canadian First Nation students using technology that many students liked the creative ways in which technology enabled them to search for, compile and present information. Scott (2006) suggested that these creative ways also assisted students to engage in more recursive and reflective styles of learning, similar to the cyclical, interconnected way that characterises American Indian philosophy. NZCER (2004) identified that indigenous communities were increasingly able to control how their knowledge would be disseminated and accessed, recognising the need to identify ways in which they could strengthen their culture and traditions while also seeing the use of technology as a way of advancing their position in the wider, global society. Hodson's (2004) review of a Canadian Aboriginal online programme on Aboriginal Learning and Healing highlights how such traditions could be shared meaningfully through a virtual learning environment. He noted that the "successful integration of ancient tradition into a contemporary educational setting" revealed for many of the participants an "underlying longing in their lives

---

<sup>11</sup> *Canadian indigenous populations have been described in the literature as both First Nations and Aboriginal, and this is reflected in this section of the report. Where appropriate, effort has been made to distinguish references to Canadian and Australian Aboriginal communities. Reference is also made to indigenous and/or Native communities – all of which, in this section, refer to indigenous peoples including First Nations, Aboriginal and Indian.*

to be connected to a similar traditional experience in the context of their studies” (p. 115). However, Hodson (2004) also queried whether these virtual environments were the right forum to effectively promote indigenous culture and traditions. Through the programme, Hodson (2004) observed how deliberations with elders who were sharing their knowledge through stories that were then uploaded for wider access grappled with this issue. He noted that in collaboration with these elders, it was agreed that ceremonies or references to ceremonial content would not be included as an online resource because of the sacredness of these practices to them.

## **Teaching practices**

Bowers et al (2000) suggest that much can be learned from computer technology if the teacher understands that they are a “culture-mediating technology” and assert that teachers “must understand how computers amplify certain cultural ways of knowing and how they reduce or eliminate others” (p. 193). In particular, they warn against computers being seen as culturally progressive if it is at the expense of traditional Native knowledge forms and teaching practices including the oral transmission of knowledge.

Ereaux (1998) acknowledges that Native communities are not averse to technology itself, but note that the wariness has come from experiences with people using technology inappropriately. As Warner (1998) notes:

How technology shapes its users (students, teachers, and parents), as well as the voice, is a central issue in understanding the transformation at hand (p. 79).

Scott’s (2006) study, on how First Nation students engaged with multimedia technology to present stories grounded in their own histories, provided an example of how computers could co-exist comfortably alongside cultural knowledge forms without compromising cultural practices and values. Scott felt that the support of elders in the students’ project was critical. According to Scott (2006), technology was seen as a way of bringing in and involving the community, where elders support of what the students were doing were reflected in how they could see the projects contributing to what they valued for their children: “knowledge of culture and ways of being as well as providing a bridge between cultures” (p. 54). Furthermore, the collaborative focus of this type of initiative ensured that the role of the teacher changed to a more facilitative role, enhancing community engagement in learning.

## **Creating learning opportunities through e-Learning**

Jacobs, Tuttle and Martinez (1998) suggest that using digital technological forms, such as CD-Roms, can be a useful way of preserving traditional indigenous knowledge. Their project, the Tewa Language Project CD-Rom, “intended to preserve, restore to use, and repatriate cultural capital” with the overriding objective being to encourage young people to engage in language and Tewa cultural production (p. 45). Similarly, the Four Directions project (Roy, 1998) sought to bring together Native students, teachers and community members to train them in using a range of technologies in the hope that such a model might provide leadership in helping Native communities use technology. According to Roy (1998), the project was focused on developing culturally relevant and appropriate learning resources that incorporated the lived experiences of Native students; on integrating the use of technology throughout the curriculum and on using technology to “enhance, explore and initiate culturally relevant curricula” according to locally developed curriculum (p. 61).

These opportunities to collect and store traditional knowledges were always accompanied by cautions about ensuring such knowledges had adequate measures in place to protect them from inappropriate access or

manipulation of the information. Hodson's (2004) study questioned whether the integrity of Canadian Aboriginal knowledge could survive the transition to the internet, noting that a search of the internet for websites relating to Canadian Aboriginal peoples and healing "reveals myriad Web sites that are clear appropriations of Aboriginal cultures and spiritual traditions" most of which are a "mishmash of new age nonsense" that may "pose a threat to Aboriginal peoples, especially our young people as they access the technology" (p. 117). This was of particular concern to Hodson (2004) who was aware of the increasing interest younger Canadian Aboriginal people who were using the internet as a way of trying to reconnect with their culture.

### **Challenges to cultural practices**

Bowers et al (2000) ask a critical question about the impact of technology on Native communities, which has relevance to understanding e-Learning for indigenous communities. They ask, "what changes in cultural ways of thinking, values, and interaction are reinforced when Native students engage in computer-based learning?" (p. 189) Specifically, they refer to how communication via technology is "abstract and reductionist" which changes cultural ways of communicating, including face-to-face and intergenerational communication and learning approaches "essential" to Native American communities (p. 191). These processes "reinforce the Western pattern of 'individual-centred relations' " which:

Undermine local knowledge and create a special challenge for cultures attempting to maintain their traditions of community and spiritual connectedness. (Bowers et al, 2000, p. 185).

In particular, they caution against the view that computers are culturally neutral, arguing that "when students use the computer their patterns of thinking must adapt to the requirements of the machine and to the thought patterns of the people who wrote the software" (p. 189). This view harks back to the impact of the printed word on Native communities which was also represented as a "culturally neutral technology" but which in reality was an example of the "progress" of assimilating Native peoples into the dominant culture (Bowers et al, 2000, p. 186). Bowers et al specifically question the "claim that computers will help Native students learn about their cultural traditions" (p. 184).

At another level, Ereaux's (1998) examination on the impact of technology on tribal colleges queries the extent to which technology should be used by such institutions if technology facilitates the destruction of "societies and philosophies that are key to their missions and philosophies" (p. 118). Two Horses (1998) provides a useful example to illustrate why Native communities should be cautious in embracing technology uncritically. Talking about the facelessness of technologies such as the internet and telephones, Two Horses (1998) argues that the ease and convenience of communication facilitated through these types of technologies creates false senses of connections:

Westerners, and to some extent the rest of the world's population, have learned to say, "I talked with my Grandma on the phone," and "I saw some camels on the television," when the reality is that "I spoke into a machine that encoded my voice into a series of electrical impulses that then traveled a thousand miles and were de-coded by a similar machine my Grandma owns so that she could hear a representation of my voice," and "I saw billions of electrons striking a phosphor-laden screen in a machine in my living room, and the picture produced thereby was of some camels". (p. 32)

This 'de-contextualising' of learning disconnects learners thus creating "unreal experiences for real ones due to our training as media consumers" which set up "flawed interactions that occur all too often online" (Two

Horses, 1998, p. 32). The concern here is that such interactions not only create disconnections for indigenous peoples and their communities but also can serve to reinforce stereotypes about indigenous communities, a view shared by Warner (1998) and Howe (1998).

The message of caution about the destruction and decontextualising of indigenous knowledges (as noted above by Ereaux, 1998 and Two Horses, 1998), is reinforced by Carr-Chellman (2005) who implores indigenous peoples to be more fully aware of “the ways in which technology itself may be robbing us” (p. 7). Carr-Chellman (2005) advocates a return to “an indigenous understanding of what learning is about” where, by respecting the learner in the process of creating online learning environments, “we are probably one step closer to more democratic forms of online learning” (p. 6). In particular, Carr-Chellman (2005) challenges indigenous peoples to think about the impact that technological advances have on indigenous cultures and ways of knowing and doing. Carr-Chellman is not against the role that technology can play in indigenous communities. Rather, she questions the way in which such technology seeks to capture and commodify, if allowed and left unchecked, indigenous knowledge forms and practices.

Much of the literature in this section has highlighted the dilemma facing indigenous communities as they try to adapt to the changes that technology brings without losing control of their traditional knowledges and cultural practices. The examples given in this section highlight that while indigenous communities are not averse to accepting and using new technologies, they are constantly wary of how these technologies relate to indigenous peoples’ aspirations for cultural preservation.

# TEACHING AND LEARNING PRACTICES THAT APPEAR MOST LIKELY TO CONTRIBUTE TO ENHANCED LEARNING OUTCOMES FOR STUDENTS IN KURA KAUPAPA MĀORI

## Introduction

The dearth of literature on e-Learning and kaupapa Māori environments makes it difficult to confidently assert what types of teaching and learning practices might contribute to enhanced learning outcomes for students in kura kaupapa Māori settings. However, there were common themes in the literature which suggested how Māori might consider or approach e-Learning technologies. For example, in his introduction to the ITPNZ report (undated) Monte Ohia commented that with the advent and proliferation of e-Learning technologies, Māori needed to be in a position to explore and use them confidently:

Māori have enough entrepreneurial spirit and opportunism to be at the cutting edge of technological innovation and creativity, and lead in its engagement with Māori learners and resource people. This knowledge and skill will not jump out of the sky at us. In the best traditions of Tawhaki, we have to retrieve it in cooperation with those who already have it. For e-Learning, Māori initially will work with experts who already have the skill and experience, and gradually build our own expertise. (p. 3)

This final section of the report reflects on Monte Ohia's words and considers what has emerged from those who have the skill and experience (and who have informed this literature review) to inform ways in which Māori might eventually take more control over teaching and learning effectively and appropriately in kaupapa Māori e-Learning environments.

## The importance of the learning environment

The creation of learning environments that are conducive to Māori students has proved possible in an e-Learning context. The literature identified several ways in which such environments could be created, including acknowledgement of and incorporating Māori cultural knowledge into e-Learning environments and settings. The *hangi* interactive (as discussed on pages 16, 17 and 20 of this report) and opportunities to communicate in te reo Māori on the *wickED* website (as discussed on page 10) were two examples of how Māori cultural knowledge could be incorporated appropriately (see also Waiti, 2005; Trewern and Wenmoth, 2008). The lack of suitable, easily accessible and appropriate resources in te reo Māori continues to be an issue for kaupapa Māori environments. Waiti (2005) noted how teachers in some kaupapa Māori settings were still developing their own resources – some translating resources into te reo Māori while others developed their own – thus adding to concerns about whether this is an effective utilisation of teachers' skills and time, and the impact this might have on their teaching practice. Conversely, the engagement by some of these teachers in developing and/or adapting these resources to the specific needs of their learning environments could also suggest that these teachers are engaging appropriately with e-Learning resources in ways that seek to get maximum benefit for the teaching and learning experience. These contradictory statements point to a need for further research on what is happening in kaupapa Māori settings to better understand how e-Learning does work for Māori students.

The importance of the learning environment in kaupapa Māori e-Learning contexts also extended to the physical e-Learning environment. Here, the physical environment relates to the technological infrastructure

or ICT support systems that are required to facilitate e-Learning. In particular, experiences of unreliable data connections, lack of access to technical expertise and the ‘learn as you go’ approach were seen as being inhibitors to effective engagement in e-Learning for Māori (Waiti, 2005). Examples were given in Waiti’s study where teachers (and subsequently their school leaders) experienced frustration when technology failed, meaning that lessons designed specifically incorporating e-Learning technologies (such as video-conferencing, PowerPoint presentations and so forth) were wasted. At a structural level, Waiti (2005) found that while the *KAWM* initiative gave schools involved support to “provide a “critical mass” of hardware, software, technical, and professional support,” the impact across the schools involved was variable, complicated by differing expectations of what the technology was wanted for and what it could actually deliver (p. xiii).

At a more basic level, Waiti (2005) also noted that some teachers in the *KAWM* initiative struggled to provide appropriate physical teaching and learning spaces for their students. Examples were given of how teachers at times had to ‘make do’ with corners of classrooms, or space in the school staffroom – highlighting that while e-Learning might have been functioning at the school, e-Learning was not necessarily incorporated more widely across the school curriculum. Teachers involved in e-Learning, and their calls for more furniture and physical dedicated spaces appropriate to e-Learning, suggest that a disconnect exists between e-Learning aspirations and e-Learning realities in kaupapa Māori settings.

Waiti (2005) noted that the creation of positive physical learning environments was also dependent on school leadership, school systems and their support for the e-Learning environment. For example, teachers and school leaders who were engaged in cross-school, collaborative e-Learning and teaching initiatives found scheduling video-conferencing teaching problematic at times due to each of the schools having different timetables (see for example the Paerangi initiative discussed in Waiti, 2005). Trying to find times where students could come together through video-conferencing, on occasions, meant taking students away from other school activities or classes, which Waiti (2005) noted required constant negotiating and raised dilemmas for schools who were trying to provide greater access to specialised learning whilst also ensuring student engagement in everyday school life.<sup>12</sup>

## **Quality relationships**

Bishop et al (2003) talk about the significance of the relationship between the teacher and the student in face-to-face classroom environments. The literature reviewed here suggests that these quality relationships are equally important for Māori students who are engaged in e-Learning education. As Waiti (2005) found:

From our discussions with the students it was clear that a successful video conference class relies on an excellent e-teacher, who is able to provide a variety of learning opportunities within the online classroom and with whom the students have a relationship (p. 56).

This was also noted by some of the teachers, one of whom noted how important establishing quality relationships was to their teaching:

I just have to do it. If I don’t have a connection with the student and even their whānau then I can’t be an effective teacher (e-teacher) (Waiti, 2005, p. 27).

---

<sup>12</sup> *The KAWM initiative has been perhaps the most comprehensive project to date which sought to incorporate e-Learning in a range of ways in kaupapa Māori settings.*

For kaupapa Māori teachers, these relationships included building clusters of expertise to provide professional support and advice for e-teachers and newer e-teachers entering into the e-Learning environment. Quality relationships also existed at system levels – where collaboration was seen to be an effective way of sharing limited resources available to Māori immersion settings, and where cluster type relationships enabled the growth and development of expert e-teachers (Waiti, 2005).

Teachers and schools involved in *KAWM* also recognised the importance of creating quality relationships between students from different schools who were involved in e-Learning. Schools and teachers created whakawhānaungatanga opportunities for those students engaged in e-Learning – such as wānanga, facilitating online sessions for student discussions. These were complemented and enhanced by other social and cultural activities (such as Manu Kōrero and kapa haka) where the students were able to move from the digital environment to face-to-face encounters, the result of which meant strengthened classroom relationships (Waiti, 2005, p. 31).

### **Cultural understandings**

In line with the literature’s findings on quality relationships, the significance of cultural understandings was also noted as an important factor for Māori students. In particular, the ability for new technologies to appropriately incorporate te reo Māori and Māori ways of knowing and doing were seen as important in being able to engage Māori students in their learning. The negative feedback from students about the ‘facelessness’ of the *wickED* website characters illustrates the challenges facing e-Learning resources and sites as they try to engage learners appropriately and in high-quality ways (Trewern & Wenmoth, 2008).

One of the high-quality ways of incorporating cultural understandings appropriately into e-Learning settings was in creating opportunities for face-to-face interactions between students and teachers. In spite of the nature of online and distance education where physical interaction is not the primary focus, for Māori and indigenous students who engaged in online and distance learning, having the opportunity to connect and make connections and relationships was seen as an important factor in ensuring students did not become isolated from their learning environment (Waiti, 2005).

At a different level, Ereaux (1998) questions whether tribal colleges can continue to be tribal colleges, which operate with the purpose of maintaining local, cultural knowledges, if they accept technology and the “rapid and invasive” changes that technology brings (p. 120). Based on research undertaken at Salish Kootenai tribal college, Ereaux found that tribal colleges could manage these diverse worlds – so long as tribal colleges were clear about how and what types of technology they would be prepared to engage with and provide ways to support tribal college students to understand the ways in which technology impacts in tribal culture. Similarly, Underwood (2007) acknowledged that the use of technology for Te Wānanga o Raukawa was dependent on how well aligned technology was to the kaupapa of the wānanga.<sup>13</sup>

The ability of technologies and systems to recognise indigenous and Māori kaupapa and aspirations still appears some way off. This could be exacerbated as much by the lack of recognition given to indigenous and Māori aspirations by funders and commissioners of technologies and systems as the lack of appropriately and culturally qualified personnel working in these areas.

---

<sup>13</sup> It should be noted that Underwood didn’t explain how the alignment was achieved.

## **Pedagogical challenges**

The literature reviewed suggests that shifts in pedagogies occur over time and are dependent on teachers gaining access to and participating in professional development to ensure they understand the pedagogical differences between teaching in traditional and e-Learning settings. Waiti (2005) found that over time teachers became more confident in using the technology available to them, noting that teachers spoke of increasingly using e-Learning tools, such as PowerPoint and digital whiteboards, as part of their teaching practice. They also grew in their understanding of how to adjust their teaching practice when incorporating technology into their lessons where, for example, if they used PowerPoint in a lesson, they also had to consider the physical layout of the class, ensuring students were positioned where they could see. Harlow, Cowie and Jones (2008) note that this is reflected in the Ministry of Education's e-Learning strategy (2006), where "effective teaching for all students will depend on teachers becoming confident and capable users of ICT and understanding how to integrate ICT effectively into their teaching practice" (p. 52).

## **Summary**

The key areas identified in this literature review suggest the importance of the learning environment, which includes the acknowledgement of culture and quality relationships, in contributing to teaching and learning approaches that may lead to enhanced outcomes for students engaged in kaupapa Māori settings. These areas are similar to the findings of other research projects engaged in better understanding what contributes to enhanced Māori student learning outcomes (for example, Bishop et al's *Te Kotahitanga* project). This suggests that in spite of the interest in and attention given to emerging technologies and their application in kaupapa Māori classrooms, the key areas as identified above establish the conditions by which enhanced teaching and learning opportunities occur.

## BIBLIOGRAPHY

- Andrews, R., & Haythornthwaite, C. (2007). Introduction to e-learning research. In R. Andrews & C. Haythornthwaite (Eds.), *Handbook of E-Learning Research*. (pp. 1-52). London: Sage. Retrieved from <http://hdl.handle.net/2142/8974>. 9 April 2009.
- Bishop, R. (1996). *Collaborative research stories: Whakawhānaungatanga*. Palmerston North: Dunmore Press.
- Bishop, R., Berryman, M., Tiakiwai, S., & Richardson, C. (2003). *Te Kotahitanga: Experiences of Year 9 and 10 Māori students in mainstream classrooms* (Final report to the Ministry of Education). Wellington: Ministry of Education.
- Bishop, R., & Tiakiwai, S. (2002). Implementing national curriculum in kura and mainstream units: Teachers' experiences in te reo Māori, Pāngarau and across the curriculum (Report to the Ministry of Education). Hamilton: University of Waikato.
- Bolstad, R. (2004). *Digital Opportunities Pilot Project 2001-2003. Evaluation of the Digital Opportunities Project: Notebook Valley* (Final Report). Wellington: Ministry of Education. Retrieved June 6, 2009 from [www.nzcer.org.nz](http://www.nzcer.org.nz).
- Bolstad, R., & Gilbert, J. (2006). *Creating digital age learners through school ICT projects: What can the Tech Angels project teach us?* Wellington: New Zealand Council for Educational Research. Retrieved May 23, 2009 from [www.educationcounts.govt.nz/publications/ict](http://www.educationcounts.govt.nz/publications/ict).
- Bowers, C., Vasquez, M., & Roaf, M. (2000). Native people and the challenge of computers: Reservation schools, individualism and consumerism. *American Indian Quarterly*, 24 (2): 182-199.
- Campbell, N., & Hawkesworth, L. (1999). The nuts and bolts of learning with the internet in indigenous contexts. *Computers in New Zealand Schools*, 11(3), 34-37. Cited in, New Zealand Council for Educational Research. (2004). *Critical success factors and effective pedagogy for e-learning in tertiary education* (Background paper for ITP New Zealand). Retrieved June 15, 2009 from <http://elearning.itpnz.ac.nz/>.
- Carr-Chellman, A. (2005). Stealing our smarts: Indigenous knowledge in on-line learning. *Seminar.net - International Journal of Media, Technology and Lifelong Learning* 1 (2): 1-10. Retrieved May 15, 2009 from [www.seminar.net/issue-2-vol.-1-2005-issn-1504-4831](http://www.seminar.net/issue-2-vol.-1-2005-issn-1504-4831).
- Chandra, V., & Lloyd, M. (2008). The methodological nettle: ICT and student achievement. *British Journal of Educational Technology*, 39 (6): 1087-1098. Retrieved June 5, 2009 from [www3.interscience.wiley.com/journal/121459407/issue](http://www3.interscience.wiley.com/journal/121459407/issue).
- Condie, R., & Livingstone, K. (2007). Blending online learning with traditional approaches: Changing practices. *British Journal of Educational Technology*, 38 (2): 337-348. Retrieved June 5, 2009 from [www3.interscience.wiley.com/journal/117984118/abstract?CRETRY=1&SRETRY=0](http://www3.interscience.wiley.com/journal/117984118/abstract?CRETRY=1&SRETRY=0).
- E-Learning Advisory Group. (2002). *Highways and pathways. Exploring New Zealand's e-learning opportunities*. (Report of the E-Learning Advisory Group). Retrieved June 1, 2009 from [www.executive.govt.nz/minister/maharey/highways/](http://www.executive.govt.nz/minister/maharey/highways/).
- Ereaux, J. (1998). The impact of technology on Salish Kootenai College. *Wicazo Sa Review*, 13 (2): 117-135.

- Gilbert, J., Morton, S., & Rowley, J. (2007). E-Learning: The student experience. *British Journal of Educational Technology*, 38 (4): 560-573. Retrieved June 5, 2009 from [www3.interscience.wiley.com/journal/117984177/issue](http://www3.interscience.wiley.com/journal/117984177/issue).
- Ham, V., & Wenmoth, D. (2007). *Evaluation of the E-Learning Collaborative Development Fund*. (Final Report to Tertiary Education Commission). Wellington: Tertiary Education Commission. Retrieved June 1, 2009 from [www.tec.govt.nz/templates/standard.aspx?id=755](http://www.tec.govt.nz/templates/standard.aspx?id=755).
- Harlow, A., Cowie, B., & Jones, A. (2008). Will the teacher's lap transform learning? *Computers in New Zealand Schools*, July 2008, pp. 51-59. Retrieved June 7, 2009 from <http://researchcommons.waikato.ac.nz/handle/10289/2091>.
- Hodson, J. (2004). Aboriginal learning and healing in a virtual world. *Canadian Journal of Native Education*; 28 (1/2): 111-122. Retrieved June 15, 2009 from Academic Research Library. (Document ID: 724870461).
- Howe, C. (1998). Cyberspace is no place for tribalism. *Wicazo Sa Review*, 13 (2): 19-28.
- Institutes of Technology and Polytechnics of New Zealand. (undated). *Critical success factors for effective use of e-learning with Māori learners*. Wellington: ITPNZ. Retrieved June 15, 2009 from <http://elearning.itpnz.ac.nz/>.
- Jacobs, S., Tulle, S., & Martinez, E. (1998). Multimedia technology in language and culture restoration efforts at San Juan Pueblo. A brief history of the development of the Tewa Language Project. *Wicazo Sa Review*, 13 (2): 45-58.
- McLoughlin, C., & Oliver, R. (2000). Designing learning environments for cultural inclusivity: A case study of indigenous online learning at tertiary level. *Australian Journal of Educational Technology*, 16 (1): 58-72. Retrieved June 15, 2009 from [www.ascilite.org.au/ajet/ajet16/ajet16.html](http://www.ascilite.org.au/ajet/ajet16/ajet16.html).
- May, S., & Hill, R. (2005). Māori-medium education: Current issues and challenges. *The International Journal of Bilingual Education and Bilingualism*, 8 (5): 377-403. Retrieved June, 2009 from [www.informaworld.com/10.1080/13670050508668621](http://www.informaworld.com/10.1080/13670050508668621).
- May, S., Hill, R., & Tiakiwai, S. (2004). *Bilingual/Immersion education: Indicators of good practice*. (Final report to the Ministry of Education). Wellington: Ministry of Education.
- Marri, A. (2007). Working with blinders on. A critical race theory content analysis of research on technology and social studies education. *Multicultural Education and Technology Journal*, 1(3): 144-161. Retrieved June 16, 2009 from [www.emeraldinsight.com/1750-497X.htm](http://www.emeraldinsight.com/1750-497X.htm).
- Ministry of Education, (2006). *Enabling the 21<sup>st</sup> century learner. An e-learning action plan for schools 2006-2010*. Wellington: Ministry of Education. Retrieved June 20, 2009 from [www.minedu.govt.nz/NZEducation/EducationPolicies/Schools/Initiatives/ICTInSchools/ICTInitiativesAndProgrammes/EnablingThe21stCenturyLearner.aspx](http://www.minedu.govt.nz/NZEducation/EducationPolicies/Schools/Initiatives/ICTInSchools/ICTInitiativesAndProgrammes/EnablingThe21stCenturyLearner.aspx).
- New Zealand Council for Educational Research. (2004). *Critical success factors and effective pedagogy for e-learning in tertiary education*. (Background paper for ITP New Zealand). Retrieved June 15, 2009 from <http://elearning.itpnz.ac.nz/>.

- Parr, J., & Fung, I. (2000). A review of the literature on computer-assisted learning, particularly integrated learning systems, and outcomes with respect to literacy and numeracy. Final report. (Report to the Ministry of Education). Wellington: Ministry of Education. Retrieved May 23, 2009 from [www.educationcounts.govt.nz/publications/ict](http://www.educationcounts.govt.nz/publications/ict).
- Piccoli, G., Ahmad, R., & Ives, B. (2001). Web-based virtual learning environments: A research framework and a preliminary assessment of effectiveness in basic IT skills training. In *MIS Quarterly*, 25 (4): 401-426.
- Pihama, L., & Penehira, M. (2005). *Building baseline data on Māori whānau development and Māori realising their potential*. (Report to Te Puni Kōkiri). Wellington: Te Puni Kōkiri.
- Pihama, L., Smith, K., Taki, M., & Lee, J. (2004). *A literature review on kaupapa Māori and Māori education pedagogy*. (A report for ITPNZ). Auckland: International Research Institute for Māori and Indigenous Education, University of Auckland.
- Porima, L. (undated). *Understanding the needs of Māori learners for the effective use of eLearning*. Wellington: ITPNZ. Retrieved June 15, 2009 from <http://elearning.itpnz.ac.nz/>.
- Rata, E. (2004). *Ethnic ideologies in New Zealand education. The problem with Kaupapa Māori*. TEFANZ Teacher Education in Aotearoa/New Zealand Conference. 5-7 July 2004.
- Raza, A., & Murad, H. (2008). Knowledge democracy and the implications to information access. In *Multicultural Education & Technology Journal*, 2 (1): 37-46. Retrieved June 16, 2009 from [www.emeraldinsight.com/1750-497X.htm](http://www.emeraldinsight.com/1750-497X.htm).
- Roberts, A. (2004). Analysing patterns and relationship around a bond of common text: Purposes, dilemmas, and possibilities of a virtual community. In *Journal of Research on Technology in Education*, 37 (1): 1-27.
- Rogers, P. Graham, C., & Mayes, C. (2007). Cultural competence and instructional design: Exploration research into the delivery of online instruction cross-culturally. In *Education Technology and Research Development*, 55 (3): 197-217. Retrieved May 20, 2009 from [www.springerlink.com/content/g5xq14p1g550/?p=07716217c2ce4a428a5f3519d30b7135&pi=12](http://www.springerlink.com/content/g5xq14p1g550/?p=07716217c2ce4a428a5f3519d30b7135&pi=12).
- Roy, L. (1998). Four Directions: An indigenous education model. In *Wicazo Sa Review*, 13 (2): 59-69. Retrieved June 13, 2009 from [www.jstor.org/stable/1409146](http://www.jstor.org/stable/1409146).
- Schutte, J. (1997). *Virtual teaching in higher education: The new intellectual superhighway or just another traffic jam?* California State University, Northridge, California. Retrieved June 10, 2009 from [www.csun.edu/sociology/virexp.htm](http://www.csun.edu/sociology/virexp.htm).
- Scott, T. (2006). Watch out for the W/HOLE! Student multimedia projects and culturally based education. In *Canadian Journal of Native Education*, 29 (1): 43-57.
- Smith, G. (1997). *The development of Kaupapa Māori: Theory and praxis*. Unpublished PhD thesis, Auckland: University of Auckland.
- Smith, L. (1999). *Decolonising methodologies. Research and indigenous peoples*. London: Zed Books.
- Stevens, K. (2005). Rural schools as regional centres of e-learning and the management of digital knowledge: The case of Newfoundland and Labrador. In *International Journal of Education and*

- Development using Information and Communication Technology (IJEDICT)*, 2 (4): 119-127.  
Retrieved June 10, 2009 from <http://ijedict.dec.uwi.edu/viewarticle.php?id=229&layout=html>.
- Trewern, A., & Wenmoth, D. (2008). *Evaluation of student facing web-based services: WickED (CORE Education)*. (Report to the Ministry of Education). Wellington: Ministry of Education. Retrieved May 12, 2009 from [www.educationcounts.govt.nz/publications](http://www.educationcounts.govt.nz/publications).
- Two Horses, M. (1998). Gathering around the electronic fire: Persistence and resistance in electronic formats. In *Wicazo Sa Review*, 13 (2): 29-43.
- Underwood, J. (2007). *Te Wānanga o Raukawa. eCDF ePortfolio project implementation case study*. Retrieved June 1, 2009 from [www.tec.govt.nz/templates](http://www.tec.govt.nz/templates).
- Waiti, P. (2005). *Evaluation of Kaupapa Ara Whakawhiti Matauranga (KAWM)*. Wellington: Ministry of Education. Retrieved May 6, 2009 from [www.educationcounts.govt.nz/publications/maori\\_education/5087](http://www.educationcounts.govt.nz/publications/maori_education/5087)
- Wall, K. (2008). Reinventing the wheel? Designing an Aboriginal recreation and community development program. In *Canadian Journal of Native Education*, 31 (2): 70-93.
- Warner, L. (1998). Technology issues in Indian Country today. In *Wicazo Sa Review*, 13 (2): 59-69.
- Wild, M., & Henderson, L. (1997). Contextualising learning in the World Wide Web: Accounting for the impact of culture. In *Education and Information Technologies*, 2 (3): 179-192. Retrieved June 12, 2009 from [www.springerlink.com/content/r6227k22p2733m1k/](http://www.springerlink.com/content/r6227k22p2733m1k/).
- Wilson, B. (2004). Designing e-learning environments for flexible activity and instruction. In *Educational Technology Research and Development*, 52 (4): 77-84. Retrieved June 12, 2009 from [www.springerlink.com/content/13t0263n189w8735/](http://www.springerlink.com/content/13t0263n189w8735/).