

Research Reports

INTRODUCTION In mid-2004 the New Zealand Ministry of Education announced the funding of five research projects under the TeLRF Round One. The Ministry's Request for Proposals indicated that the goal of the first round of research was to establish the current context and future impact of tertiary e-learning on learners, teachers, and providers in New Zealand. Shortly after the Ministry's announcement, the *Journal* editors asked project leaders if they would be prepared to submit a brief description of the nature of their project and the methodology being used within the research. We are pleased to be able to present accounts from two of those projects in this issue.

Determination of New Zealand Tertiary Institution E-learning Capability: An Application of an E-learning Maturity Model

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RATIONALE A significant challenge facing most tertiary institutions is identifying organisational strategic and operational priorities for investment in e-learning capability—in short, containing the rising cost of e-learning infrastructure while maximising the educational outcomes for students.

This project is engaging in a detailed e-learning capability determination exercise over a number of New Zealand Tertiary Education Organisations (TEOs). This will assess their current strategic and operational capability for delivering and maintaining e-learning in an educationally effective but also organisationally effective manner. This process is intended to validate a framework for conducting such capability determinations and provide a documented standard methodology

for determining e-learning strengths and weaknesses institutionally and by sector.

Use of such a framework and the underlying e-learning Maturity Model represents a number of significant opportunities for New Zealand:

1. Firstly, an e-learning process improvement model could provide a road map for higher education institutions looking to improve their e-learning processes. It is clear that a series of signposts or a map that might guide institutional planners in areas of resource allocation and staff and student support has some merit.

2. An accepted framework might also provide academics with the necessary means to encourage greater institutional involvement. The advantage of the

proposed model is that it presents a high enough overview that it can be usefully understood without a need to examine detailed reports and metrics or be familiar with an extensive pedagogical and technological research literature.

3. Support for institutional planning might be enhanced by an institution or unit's ability to benchmark its current capability, to identify and prioritize necessary improvements in its current practices. The model allows for different technical platforms, organizational models, and pedagogical beliefs.

Perhaps most importantly, like the software process improvement approaches on which the model is based, this project might form the basis for an ongoing discussion within the e-learning community with a view to identifying the key practices, heuristics, or activities necessary for achieving improvements in e-learning activities.

CONTEXT Large sums of money are being invested in expensive systems such as those provided by Blackboard (<http://www.blackboard.com>) which can cost hundreds of thousands of dollars annually to license and deploy. Despite this investment, uncertainty remains over whether the investment is resulting in improved learning outcomes for students (Conole, Oliver, & Harvey, 2000; Taylor 2001). This problem was noted in the New Zealand Government-funded "Highways and Pathways" document:

In its research to date, the Advisory Group has found very little evidence of evaluation of strategies that might inform New Zealand's strategic vision [on e-learning]. (E-learning Advisory Group, 2002, p. 19)

More fundamentally, concerns remain among many teachers about the validity and quality of learning possible through on-line provision. These concerns are reinforced by the lack of agreed standards for academic quality and resource development. (E-learning Advisory Group, 2002, p. 11)

In an attempt to move from an area characterised by individual heroics and unsustainable projects driven by passionate teachers, there have been numerous attempts to document "best practice" such as Chickering's Seven Principles (Chickering & Ehrmann, 1996), the work of the National Learning Infrastructure Initiative (Hagner, 2001), and the benchmarks created for the Institute for Higher Education Policy (2000). These heuristics have been complemented by a development of technical standards such as the Shareable Content Object Reference Model (Department of Defense, 2001) and the work of the IMS Global Learning Consortium (2003).

A weakness with these approaches is the focus on the outcomes of individual initiatives rather than a deeper analysis of the institutional context. The problem is the need for a more holistic approach with a focus on best systems rather than on individual practices (Hagner, 2001). Much of the published e-learning literature has resulted in recommendations for institutions, but identifying limitations with current institutional e-learning practices in an efficient and detailed way remains challenging. Such an understanding is needed for institutions to incrementally improve organisational e-learning capability (Laurillard, 1997), particularly as institutions will usually need to choose

from the range of possible areas needing improvement, those that result in the greatest benefits for students and for the institution as a whole.

The challenge facing institutions engaged in e-learning is similar to that which faces organisations developing complex software systems and which resulted in the development of process improvement models such as the Capability Maturity Model (Paulk, Curtis, Chrissis, & Weber, 1993) and SPICE (Software Process Improvement and Capability dEtermination) (El Emam, Drouin, & Melo, 1998; SPICE, n.d.). The similarities have led us to apply the same approaches used in the development of the software process improvement models to the development of a potential e-learning process improvement model

or eMM (Marshall & Mitchell, 2002; 2003; 2004).

The development of the CMM and SPICE models resulted from extensive consultation and workshopping industry practitioners, to identify the practices that resulted in high-quality software development. These processes were validated and tested extensively through additional pilots and evaluations (El Emam, Drouin, & Melo, 1998). In the case of SPICE, this work resulted in a model identifying five main areas or process categories; these are used to organise a collection of processes and the practices that contribute to the effective performance of individual processes. Table 1 shows the development of related categories for e-learning, which are presented elsewhere (Marshall & Mitchell, 2002; 2003).

Table 1 eMM process categories

Process Category	Brief Description
Learning	Processes that directly impact on pedagogical aspects of e-learning
Development	Processes surrounding the creation and maintenance of e-learning resources
Coordination	Processes surrounding the oversight and management of e-learning
Evaluation	Processes surrounding the evaluation and quality control of e-learning through its entire lifecycle
Organisation	Processes associated with institutional planning and management

The model rates performance of each of the process categories at six levels similar to that used in SPICE (see Table 2 on the following page) and generates an overview of organizational e-learning

performance that potentially can inform strategic and operational decision-making by management (Marshall & Mitchell, 2004).

Table 2 Levels of process capability

E-learning Maturity Model: Levels	
Level	Focus
5: Optimising	Continual improvement in all aspects of the e-learning process
4: Managed	Ensuring the quality of both the e-learning resources and student learning outcomes
3: Defined	Defined process for development and support of e-learning
2: Planned	Clear and measurable objectives for e-learning projects
1: Initial	Ad-hoc processes
0: Not performed	<i>Not done at all</i>

The expectation from the experience of software maturity models (SEI, 2004) is that most, if not all, organisations will perform poorly under this model over the majority of areas assessed. This is consistent with the widely held perception that much work remains to be done to improve the quality and effectiveness of e-learning both nationally and internationally.

METHODOLOGY The project is intended to have the following outcomes:

1. A validated model and expanded set of process categories identified through examination of existing e-learning projects in the participating institutions which can form the basis of ongoing research, development, and examination of institutional e-learning capability.

2. A detailed evaluation of e-learning process capability for each participating institution which could be used to guide internal consideration of its e-learning capability.

3. A summary of e-learning capability across all participating institutions which would provide an initial overview of capability and relative performance on a sector-wide basis (all institutions would be anonymously reported on), suitable for publishing, peer review, and for informing strategic planning at both institutional and sector-wide levels.

As we already have a theoretical model, this is being used as the basis of the work. It is important to emphasize that the individual institution reports are confidential and are only going to be reported publicly in a summary form. The intention is to apply the model methodology outlined above and determine whether the theoretical design is both practical and useful, thus validating the approach. The real output is the confidence that the outcomes will provide institutions choosing to use the model to inform their own strategic and operational management of e-learning.

In order to achieve these outcomes in the limited time available, the project was broken down into three phases:

Phase 1 (July 2004 to August 2004)

- Distribution of e-learning process-capability model to interested institutions for consultation and final agreement to participate in project.
- Development of detailed programme for evidence collection and visits to participating institutions in e-learning process-capability study.

Phase 2 (September 2004 to January 2005)

- Collection of evidence of e-learning process-capability from participants.
- Evaluation of e-learning process-capability evidence collection process.
- Redevelopment of e-learning process-capability model to reflect feedback and evidence collected.

Phase 3 (February 2005 to March 2005)

- Dissemination of validated e-learning process capability model and self-assessment methodology to all New Zealand TEOs.
- Reporting project outcomes to Ministry.

A total of twenty-one organisations have been approached to participate in the study. It is expected that detailed reports will be produced for between five and ten of these, covering a range of institutions from small rural polytechnics to wānanga and large urban universities.

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Research in Progress: Learning from Adopters and Resisters of E-learning in New Zealand Polytechnics and Institutes of Technology

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INTRODUCTION The exponential growth of e-learning practices in higher education has resulted in an increasing interest in the ways in which faculty members in tertiary institutions perceive e-learning and the ways in which they apply e-learning in their courses. Faculty who might be described as “innovators” or “early adopters” have generally embraced e-learning enthusiastically; other faculty remain disengaged or disinterested. Disengagement may be due to faculty concerns about access to

technology, software, and networks or it may stem from concerns about time allocations and staff support. Disinterest may be due to a perceived lack of relevance of e-learning strategies to particular courses, or it may simply reflect faculty members’ dispositions to change, innovation, and adoption. The project briefly described in this paper seeks to determine the causes of disengagement and disinterest in the adoption of e-learning approaches among teaching faculty.