

BENCHMARKING INTERNATIONAL E-LEARNING CAPABILITY WITH THE E-LEARNING MATURITY MODEL

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Abstract

The E-Learning Maturity Model (eMM) provides a means by which institutions can assess and compare their capability to sustainably develop, deploy and support e-learning. The eMM has been successfully piloted and refined in eleven New Zealand tertiary institutions (seven universities and four polytechnics) and used to both guide individual institution's understanding of their e-learning capability as well as providing useful information on the sector as a whole - outcomes which can be translated into any other institutional and regional context in order to guide strategic and operational planning and investment. This paper describes the extensively updated set of benchmarks and methodology that constitute the current version of the eMM along with results from further application of the eMM in the UK and New Zealand. Lessons learnt from the perspectives of institutional leadership and quality improvement of e-learning are included.

Introduction

The E-Learning Maturity Model (Marshall and Mitchell 2006) provides a means by which institutions can assess and compare their capability to sustainably develop, deploy and support e-learning. The eMM is based on the ideas of the Capability Maturity Model (CMM, Paulk *et al.*, 1993) and SPICE (Software Process Improvement and Capability dEtermination, El Emam *et al.* 1998; SPICE 2002) methodologies. The underlying idea that guides the development of the eMM is that the ability of an institution to be effective in any particular area of work is dependent on their capability to engage in high quality processes that are reproducible and able to be extended and sustained as demand grows.

A key aspect of the eMM is that it does not rank institutions, but rather acknowledges the reality that all institutions will have aspects of strength and weakness that can be learnt from and improved. The rapid growth in the technologies being used, the ways that they are being applied across an ever widening group of academic disciplines and the evolving skills and experience of teachers and students means that e-learning is a moving target. Any benchmarking approach that presumes particular e-learning technologies or pedagogies is unlikely to meaningfully assess a range of institutions within a single country, let alone allow for useful international collaboration and comparison, particularly over an extended period of time.

As a consequence of the desire for the eMM to support technological and organisational change, the meaning of e-learning implicit in the eMM is broadly defined. At the heart lies the impact of computers and related communication technologies on the range of activities traditionally undertaken by teachers and learners. However, as the eMM is institutionally focused, the model considers the wider implications of the use of digital technology, most particularly the systems and resources needed to ensure that the use of technology by students and teachers is efficient, effective, and can be sustained operationally and strategically.

This model has been successfully piloted and refined in New Zealand (Marshall and Mitchell 2005; Marshall 2005, 2006a) and used to both guide individual institution's understanding of their e-learning capability as well as providing useful information on the sector as a whole. Benchmarking e-learning capability in this manner is necessary for programme managers to understand where their organization lacks capacity to meet its goals and consequently prioritize investment.

Although this paper uses the term "institution" to refer to the organizational unit being assessed, this is not a requirement of the model itself. As is illustrated by the results for the UK institution below, it is possible to conduct multiple eMM assessments within a single institution, thus gaining insights about disciplinary, structural or other organizationally important divisions of the institution.

Key Concepts of the eMM

Capability

Capability is perhaps the most important concept incorporated in the eMM. It describes the ability of an institution to ensure that e-learning design, development and deployment is meeting the needs of the students, staff and institution. Critically, capability includes the ability of an institution to *sustain* e-learning delivery and the support of learning and teaching as demand grows and staff change. As noted by Fullan:

"The answer to large-scale reform is not to try to emulate the characteristics of the minority who are getting somewhere *under present conditions* ... Rather, we must change existing conditions so that it is normal and possible for a majority of people to move forward"
(Fullan 2001, page 268)

Dimensions of capability

A key development that arose from the application and analysis of the first version of the eMM is that the concept of levels reused from the CMM and SPICE was unhelpful in describing the capability of an individual process (Marshall and Mitchell 2006). The use of levels incorrectly implies a hierarchical model of process improvement where capability is assessed and built in a layered and progressive manner. The concept underlying the eMM's use of dimensions is holistic capability. Rather than the model measuring progressive levels, it describes the capability of a process from the synergistic perspectives of *Delivery, Planning, Definition, Management and Optimisation*.

In thinking about the relationship between the five dimensions it is helpful to consider them arranged as in Figure 1. The row of boxes used on the left to display summaries of process capabilities is helpful when performing comparisons within or between assessments (for example Figure 4) but it can imply a hierarchical relationship that is misleading when interpreting individual process capability results.

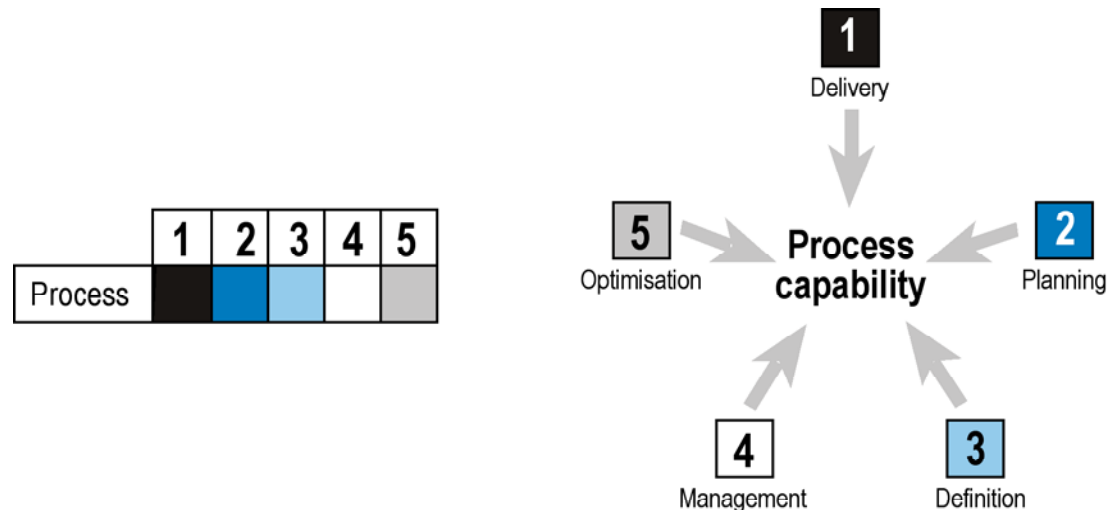


Figure 1: eMM Process Dimensions

Dimension 1 (Delivery) is concerned with the creation and provision of process outcomes. Assessments of this dimension are aimed at determining the extent to which the process is seen to operate within the institution.

Dimension 2 (Planning) assesses the use of predefined objectives and plans in conducting the work of the process. The use of predefined plans potentially makes processes more able to be managed effectively and reproduced if successful.

Dimension 3 (Definition) covers the use of institutionally defined and documented standards, guidelines, templates and policies during the process implementation. An institution operating effectively within this dimension has clearly defined how a given process should be performed. This does not mean that the staff of the institution follows this guidance.

Dimension 4 (Management) is concerned with how the institution manages the process implementation and ensures the quality of the outcomes. Capability within this dimension reflects the measurement and control of process outcomes.

Dimension 5 (Optimisation) captures the extent an institution is using formal approaches to improve the activities of the process. Capability of this dimension reflects a culture of continuous improvement.

An organisation that has developed capability on all dimensions for all processes will be more capable than one that has not. Strong capability at particular dimensions that is not supported by capability at the other dimensions will not deliver the desired process outcomes. Capability at

dimensions one and two that is not supported by capability in the other dimensions will be ad-hoc, unsustainable and unresponsive to changing organisational and learner needs. Capability in dimensions three, four and five that is not complemented with similar strength at dimensions one and two will be unable to meet the process goals and liable to fail.

Processes

The eMM divides the capability of institutions to sustain and deliver e-learning into five major categories or process areas (Table 1) that indicate clusters of strongly related processes. It should be noted however that all of the processes are interrelated to some degree, particularly through shared practices and the perspectives of the five dimensions.

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
Co-ordination	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

Table 1: eMM version two process categories (revised from Marshall and Mitchell, 2003)

The processes used in version one of the eMM were developed from the 'Seven Principles' of Chickering and Gamson (1987) and 'Quality on the Line' benchmarks (IHEP 2000) as outlined in Marshall and Mitchell (2004). These had the advantage of being widely accepted as guidelines or benchmarks for e-learning delivery (Sherry 2003), however experience in using them during the initial capability assessment of nine New Zealand institutions reported in Marshall (2005) identified some significant limitations.

Applying the recommendations from the evaluation of the first version of the eMM resulted in a reduced set of thirty four processes that were then subjected to further review through a series of workshops conducted in Australia and the UK (Marshall, 2006a). This identified a potential set of three hundred and fifty four possible items (Table 2).

Examining the sorted items in Table 2 it is apparent that support issues dominated the concerns of the workshop participants, who included a mix of e-learning experts, practitioners and managers. The desire for an e-learning strategy and plan was repeatedly noted, but a focus on operational concerns was apparent from the absence of items at the higher dimensions.

Process Area	Dimension					Total Unique Items	Total Items
	Delivery	Planning	Definition	Management	Optimisation		
Learning	35	14	4	2	0	55	63
Development	38	24	17	5	0	84	147
Support	43	28	15	7	0	93	216
Evaluation	13	12	0	12	1	38	51
Organisation	38	21	21	4	0	84	159
	167	99	57	30	1	354	

Table 2: Summary of Workshop Process Brainstorming

In addition, an extensive literature review was conducted (Marshall 2006a, 2006b) which identified three hundred and seventy seven items, which were also grouped into forty-two themes or potential processes. Support was also a strong theme here, both for students (theme 12) and for staff engaged in e-learning design and development (theme 2).

Category	No. of Themes	No. of Items
1. Expectations	3	12
2. Course design	7	63
3. Student-teaching staff communication	3	11
4. Student-peer communication	2	12
5. Active learning	4	28
6. Time on task	2	9
7. Diversity	3	40
8. Assessment	2	19
9. Learning outcomes	3	32
10. Teaching staff support	2	16
11. Programme evaluation	4	34
12. Student support	4	80
13. Miscellaneous/Technology specific	3	21
Total	42	377

Table 3: Summary of Literature Review

These three sources of information: version one of the eMM; the workshop findings; and the literature review; were then aligned and this has resulted in the processes listed below in Table 4 which constitute eMM version 2.2.

Learning: Processes that directly impact on pedagogical aspects of e-learning	
L1.	Learning objectives are apparent in the design and implementation of courses
L2.	Students are provided with mechanisms for interaction with teaching staff and other students
L3.	Student skill development for e-learning is provided
L4.	Information provided on the type and timeliness of staff responses to communications students can expect
L5.	Students receive feedback on their performance within courses
L6.	Research and information literacy skills development by students is explicitly supported
L7.	Learning designs and activities result in active engagement by students
L8.	Assessment of students is designed to progressively build their competence
L9.	Student work is subject to specified timetables and deadlines
L10.	Courses are designed to support diverse learning styles and learner capabilities
Development: Processes surrounding the creation and maintenance of e-learning resources	
D1.	Teaching staff are provided with design and development support when engaging in e-learning
D2.	Course development, design and delivery are guided and informed by formally developed e-learning procedures and standards
D3.	Explicit linkages are made in the design rationale regarding the pedagogies, content and technologies chosen
D4.	Courses are designed to support disabled students
D5.	All elements of the physical e-learning infrastructure are reliable, robust and sufficient
D6.	All elements of the physical e-learning infrastructure are integrated using defined standards
D7.	Resources created are designed and managed to maximise reuse
Support: Processes surrounding the support and operational management of e-learning	
S1.	Students are provided with technical assistance when engaging in e-learning
S2.	Students have access to a range of library resources and services when engaging in e-learning
S3.	Student enquiries, questions and complaints are collected formally and managed
S4.	Students have access to support services for personal and learning issues when engaging in e-learning
S5.	Teaching staff are provided with pedagogical support and professional development in using e-learning
S6.	Teaching staff are provided with technical support in the handling of electronic materials created by students
Evaluation: Processes surrounding the evaluation and quality control of e-learning through its entire lifecycle	
E1.	Students are able to provide regular formal and informal feedback on the quality and effectiveness of their e-learning experience
E2.	Teaching staff are able to provide regular formal and informal feedback on quality and effectiveness of their e-learning experience
E3.	Regular formal independent reviews of e-learning aspects of courses are conducted
Organisation: Processes associated with institutional planning and management	
O1.	Formal criteria used to allocate resources for e-learning design, development and delivery
O2.	Institutional learning and teaching policy and strategy explicitly address e-learning
O3.	A documented specification and plan guides technology decisions when designing and developing courses
O4.	A documented specification and plan ensures the reliability, integrity and validity of information collection, storage and retrieval
O5.	The rationale for e-learning is placed within an explicit plan
O6.	E-learning procedures and which technologies are used are communicated to students prior to starting courses
O7.	Pedagogical rationale for e-learning approaches and technologies communicated to students prior to starting courses
O8.	Course administration information communicated to students prior to starting courses
O9.	The provision of e-learning is guided by formal business management and strategy

Table 4: eMM Version Two Processes (Marshall 2006b)

Of course, many of the processes in Table 4 apply to any form of learning and teaching. This is not unexpected, as e-learning is a particular form of learning, not a subset. The focus of these common processes in the context of the

eMM is on their contribution to e-learning effectiveness and sustainability, undoubtedly this will relate strongly to wider learning and teaching activities, but such is not the focus of the eMM.

There are also some specific concepts, technologies or activities that may appear to be absent when reading this list of processes. For example, the commonly stated requirement that an institution have an e-learning strategy. In this case the desired outcome is that an institution guides its investment and energies systematically and in line with defined learning and teaching goals that are clearly communicated to its staff and students, and this is reflected in processes O1, O2 and O9. An e-learning strategy is a convenient and sometimes effective means to achieving this end.

There are no quantitative metrics apparent in these processes. The need for measurement of process outcomes by an institution is reflected in the eMM particularly in the higher dimensions *Management* and *Optimisation*. This enables the model to support the use of whatever metrics are sensible in the specific institutional context while still assessing how effective the institution is collecting and using such information.

Practices

Each process in the eMM is broken down within each dimension into practices that define how the process outcomes might be achieved by institutions. These practices are either essential for the process to be successfully achieved (bold type) or just useful in supporting the outcomes of the particular process (regular type). The practices are intended to capture the key essences of the different dimensions of the processes as a series of items that can be assessed easily in a given institutional context. As an example, Table 5 lists the practices for dimension one (delivery) for one process.

Dimension	Practices
1. Delivery	<p>Learning objectives are provided explicitly in the formal descriptions of the course provided to students, including the summary versions provided prior to enrolment as well as within detailed course prospectuses or syllabi.</p> <p>Learning objectives are linked explicitly throughout learning and assessment activities using consistent language.</p> <p>Learning objectives for individual courses or modules are explicitly linked to wider programme or degree objectives and institutional graduate attributes.</p> <p>Learning objectives are aimed at supporting student cognitive outcomes that go beyond recall and acquisition of knowledge.</p> <p>Course workload expectations and assessment tasks are consistent with the learning objectives.</p>

Table 5: eMM Version Two Process L1 dimension 1 practices (Marshall 2006b)

Capability assessment criteria

Each practice is rated for performance during an assessment from *not adequate* to *fully adequate* (Figure 2) either by an external assessor (as is the case with the results reported here) or a self-assessor by reference to the practice statement. The ratings at each dimension are done on the basis of the evidence collected from the institution and are a combination of whether or not the practice is performed, how well it appears to be functioning, and how prevalent it appears to be. This provides a useful future-proofing mechanism as performance that is currently *fully adequate* may not be so in

the future as technologies evolve and experience in e-learning grows. Experience from the UK assessments, where five independent assessments (four internal, one external) were undertaken suggest that the assessments are very consistent, reflecting the specific concerns of the individual practice statements.

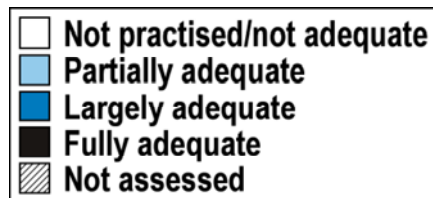


Figure 2: eMM capability assessment ratings (based on Marshall and Mitchell 2003)

Once each practice has been assessed, the results are averaged as a rating for the given dimension of the process. Practices listed in bold are essential for the achievement of the process outcomes and are used primarily to make the capability assessment, with the other practices used when making a choice between two possible assessments. In the example shown in Figure 3, the overall assessment for dimension one would be *largely adequate*, although the two practices with lower assessments indicate where additional attention could usefully be focused. A purely mechanical process with a mathematical summation has been deliberately avoided in order to provide enough flexibility within the model for differences of pedagogy, technology, organisational culture and national culture.

Process L1: Learning objectives are apparent in the design and implementation of courses (Dimension 1)		
Assessment	Practices	
1	<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	Learning objectives are provided explicitly in the formal descriptions of the course provided to students, including the summary versions provided prior to enrolment as well as within detailed course prospectuses or syllabi.
	<input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	Learning objectives are linked explicitly throughout learning and assessment activities using consistent language.
	<input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	Learning objectives for individual courses or modules are explicitly linked to wider programme or degree objectives and institutional graduate attributes.
	<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	Learning objectives are aimed at supporting student cognitive outcomes that go beyond recall and acquisition of knowledge.
	<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	Course workload expectations and assessment tasks are consistent with the learning objectives.

Figure 3: Example eMM practice capability assessment

Application of the eMM to New Zealand and the UK

The substantial revision in the eMM that has generated version two has resulted in a substantially improved methodology and process set that should enable useful international comparison between New Zealand tertiary organisations and institutions based in many other countries. In order to test this we have applied the current version of the eMM to eleven New Zealand institutions and one, much larger, UK institution. The UK results are incomplete and indicative only, as they are pilot results and are being refined and expanded as part of an UK Higher Education Authority (HEA) Pathfinder project in 2006 and 2007.

	University A	University B	University C	University D	University E	University F	University G	Polytechnic Z	Polytechnic Y	Polytechnic X	Polytechnic W	Faculty A	University UK-A Faculty B	University UK-A Faculty C	Faculty D
Learning: Processes that directly impact on pedagogical aspects of e-learning															
L1. Learning objectives are apparent in the design and implementation of courses	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
L2. Students are provided with mechanisms for interaction with teaching staff and other students	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
L3. Student skill development for e-learning is provided	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
L4. Information provided on the type and timeliness of staff responses to communications students can expect	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
L5. Students receive feedback on their performance within courses	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
L6. Research and information literacy skills development by students is explicitly supported	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
L7. Learning designs and activities result in active engagement by students	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
L8. Assessment of students is designed to progressively build their competence	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
L9. Student work is subject to specified timetables and deadlines	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
L10. Courses are designed to support diverse learning styles and learner capabilities	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Development: Processes surrounding the creation and maintenance of e-learning resources															
D1. Teaching staff are provided with design and development support when engaging in e-learning	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
D2. Course development, design and delivery are guided and informed by formally developed e-learning procedures	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
D3. Explicit linkages are made in the design rationale regarding the pedagogies, content and technologies chosen	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
D4. Courses are designed to support disabled students	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
D5. All elements of the physical e-learning infrastructure are reliable, robust and sufficient	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
D6. All elements of the physical e-learning infrastructure are integrated using defined standards	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
D7. Resources created are designed and managed to maximise reuse	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Support: Processes surrounding the support and management of e-learning															
S1. Students are provided with technical assistance when engaging in e-learning	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
S2. Students have access to a range of library resources and services when engaging in e-learning	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
S3. Student enquiries, questions and complaints are collected formally and managed	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
S4. Students have access to support services for personal and learning issues when	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
S5. Teaching staff are provided with pedagogical support and professional development in using e-learning	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
S6. Teaching staff are provided with technical support in the handling of electronic materials created by students	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Evaluation: Processes surrounding the evaluation and quality control of e-learning through its entire lifecycle															
E1. Students are able to provide regular formal and informal feedback on the quality and effectiveness of their e-learning experience	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
E2. Teaching staff are able to provide regular formal and informal feedback on quality and effectiveness of their e-learning experience	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
E3. Regular formal independent reviews of e-learning aspects of courses are conducted	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Organisation: Processes associated with institutional planning and management															
O1. Formal criteria used to allocate resources for e-learning design, development and delivery	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
O2. Institutional learning and teaching policy and strategy explicitly address e-learning	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
O3. A documented specification and plan guides technology decisions when designing and developing courses	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
O4. A documented specification and plan ensures the reliability, integrity and validity of information collection, storage and retrieval	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
O5. The rationale for e-learning is placed within an explicit plan	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
O6. E-learning procedures and which technologies are used are communicated to students prior to starting courses	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
O7. Pedagogical rationale for e-learning approaches and technologies communicated to students prior to starting courses	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
O8. Course administration information communicated to students prior to starting courses	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
O9. The provision of e-learning is guided by formal business management and strategy	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

Not practised/not adequate
 Partially adequate
 Largely adequate
 Fully adequate
 Not assessed

Figure 4: eMM Version 2 institutional e-learning capabilities

Looking at the New Zealand results on the left of Figure 4, Universities A, B, E and Polytechnics Z, Y and W are overall more capable than the remaining NZ institutions. In a significant change in discrimination from the first version of the eMM, the greater distinction between dimensions one (delivery) and two (planning) now makes the relative strengths in *Support* (University A) and *Learning* (University B) more apparent.

The greater strength of the six institutions appears to be a consequence of having employed dedicated staff who have as their job both an operational and a strategic responsibility. Not all of these six institutions are strong in the strategy and planning processes (O2, O5 and O9) nor in dimensions three (definition) and five (optimization), but there is a clear pattern of planned capability (dimension two) throughout the process assessments.

The four faculties of the UK institution are broadly consistent but with Faculties A and B showing a somewhat stronger capability, particularly in the *Learning* area. Faculties C and D, as well as being weaker were also very similar, perhaps reflecting the default position for the institution as a whole. Interestingly, the *Organisation* process area results are much more consistent than the other areas, as should follow from the focus of the processes and practices.

Looking at the entire result set it is clear that there is little evidence of capability having been assessed for dimensions four and five. This appears to reflect the general absence of evidence collection informing a systematic and strategic engagement with e-learning at a leadership level within the institutions assessed. What evidence of capability assessed for dimensions four (management) and five (optimization) was generally disconnected from the governance and leadership of institutions and there was no evidence of e-learning yet driving or responding to organisational changes.

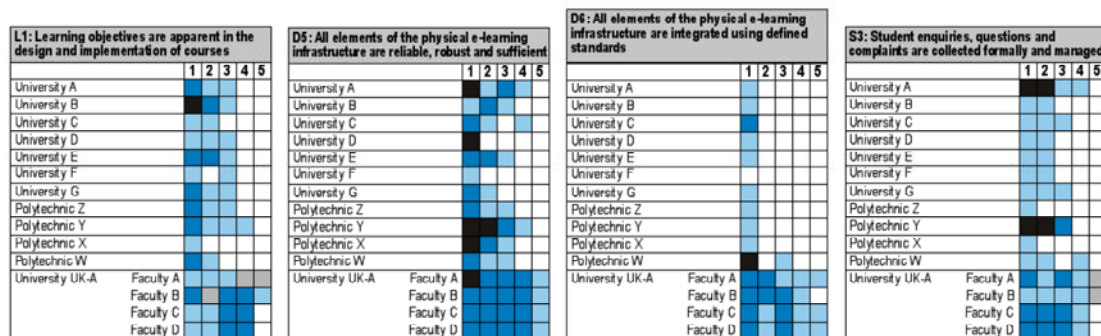


Figure 5: Individual processes strong in the UK assessments

The UK institution results were significantly better than the NZ ones in four processes (Figure 5). In part at least for D5, D6 and S3, this might reflect economies of scale for institutional systems, although the result for L1 is likely to be a consequence of external requirements on the sector. Overall however, it was perhaps unexpected that the levels of capability were so similar. Results for the UK institution are however incomplete and it is possible that additional assessments and completion of the non-assessed processes might identify additional areas of significantly stronger or weaker capability. Further institutional assessments will be needed before any general observations comparing e-learning capability in the UK with NZ can be made.

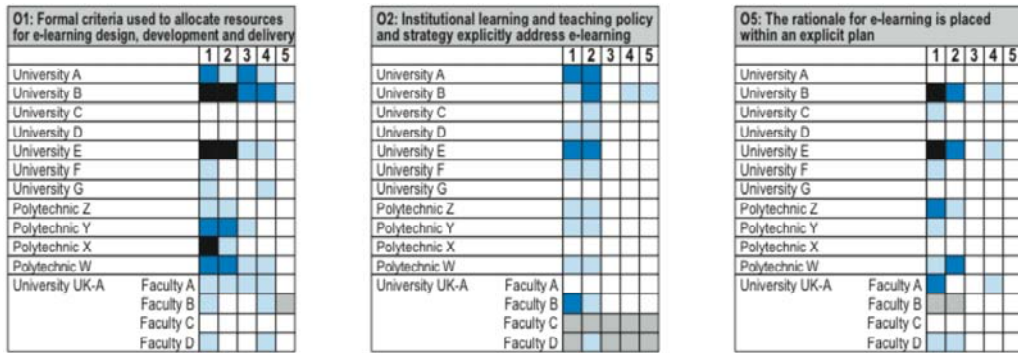


Figure 6: Organisation process results comparing the UK and NZ institutions

The lack of impact of e-learning on the governance and operation of institutions is evident in the capabilities assessed for Processes O2, O5 and O9 (Figure 6). There is very little evidence of systematic updating of learning and teaching policy and operational procedures to reflect the differences and challenges consequent to the use of e-learning nor is there much evidence of business goals and strategies driving investment in e-learning systems in other than general commitments to basic IT infrastructure and uncritical use of LMS facilities.

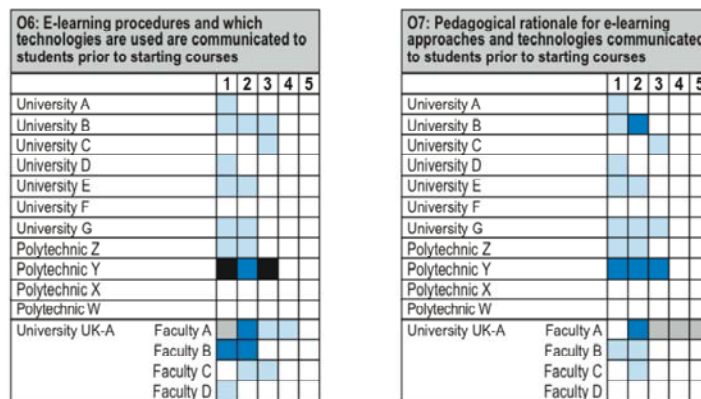


Figure 7: Communication of technological and pedagogical requirements and implications of e-learning

The implied lack of intentionality in the engagement with e-learning is perhaps also responsible for the poor communication to students of the technological and pedagogical requirements and implications of e-learning (Figure 7). This is a significant problem as it prevents students from preparing themselves for e-learning, placing a greater burden upon them, teaching staff and support services once courses commence.

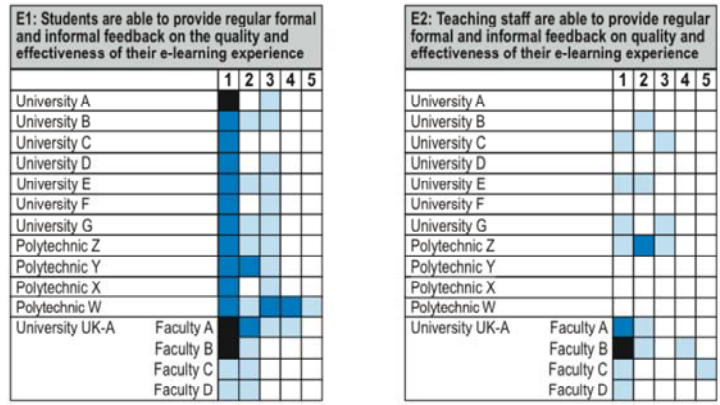


Figure 8: Staff and student feedback

The separation of *Evaluation* processes into student (Process E1) and staff (Process E2) aspects in the current version of the eMM has exposed the systemic disregard of staff in current evaluation and feedback activities across these institutions (Figure 8). The lack of evidence based practice and the use of guidelines, templates and case studies to support the work of teaching staff was apparent from the poor results at dimension three and there was little evidence of rewards or incentives for individual staff engaging in e-learning. At the practice level within the processes there was almost no evidence of institutions capturing research-based evidence of successful e-learning technology or pedagogy use.

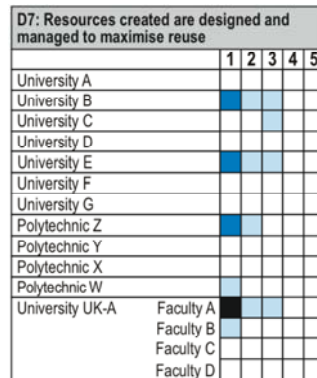


Figure 9: Reuse of e-learning resources

The absence of rewards or incentives for staff developing e-learning resources for reuse is also a possible explanation for low reuse apparent (Figure 9). The absence of formal support for reuse and development of systems to store and manage e-learning resources across all institutions (dimension three) is perhaps surprising given the high costs of developing resources and the prominence of learning objects in the e-learning research literature. This appears to reflect an ongoing ad-hoc approach to teaching design and development, with, particularly university staff seeing teaching as an independent activity undertaken in isolation by individual staff. This intuitive and informal approach is also apparent in the weak capability assessed for the *Organisation* processes above (Figure 6).

Conclusions

The results of the initial New Zealand application of the eMM have been found of value to the sector (Choat 2006, MoE 2006) and individual institutions (Petrova and Sinclair 2005), with additional anecdotal evidence that the individual institution analyses have been of value for internal review and strategic planning activities.

We have demonstrated that the eMM can be applied in international institutional contexts other than the one in which it was originally developed. The application to a larger institution has illustrated the flexibility of the assessment procedures in allowing for a detailed breakdown by faculty when appropriate and it is very likely that similar analyses examining a single institution by mode of delivery, geographical location, discipline, or other relevant criterion would result in useful insights and guidance for future investment and strategic development.

The similar results obtained from a much larger UK institution also suggest that ongoing international collaboration is of value, not only for the development of the model, but also for improving our shared understanding of the challenges facing institutions engaged in e-learning and the opportunities for supporting student learning that the new technologies and pedagogies offer.

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