

USING THE E-LEARNING MATURITY MODEL TO BENCHMARK INSTITUTIONAL LEARNING AND TEACHING PLANS AND CAPABILITIES

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The e-learning maturity model (eMM) is a well established and internationally applied quality improvement framework used to inform and guide institutional leaders and sector agencies improving the quality and sustainability of e-learning undertaken by educational institutions.

The eMM measures the capability of institutions to engage in and sustain the use of e-learning technologies and pedagogies. This information is presented in a matrix that assists leaders in the identification of priorities for improvement activities. The eMM also provides a set of key practices that facilitate the improvement in capability by providing a form of roadmap or professional standard for e-learning activities at the institutional level.

Leading change in educational institutions is a challenging process that requires that benchmarking information be delivered in a form compatible with the values, strategic priorities and operational realities of institutions. In this paper we present a case study illustrating how the eMM capability information can be expressed in a form that is consistent with an institutional and a sector framework, and show how this can be used to guide e-learning improvement activities strategically in line with wider learning and teaching goals and priorities.

INTRODUCTION

The e-learning maturity model (eMM, Marshall and Mitchell, 2002, 2003, 2004, 2005, 2006, 2007; <http://www.utdc.vuw.ac.nz/research/emm/>) is a quality improvement framework for e-learning originally based on the Capability Maturity Model (Paulk et al., 1993) and SPICE (Software Process Improvement and Capability dEtermination, El Emam et al., 1998; SPICE, 2002) methodologies, but extensively redeveloped to

reflect the realities of e-learning and the experience of practitioners in many countries (Marshall, 2008).

The goal of the eMM is to provide information for senior managers interested in understanding the totality of their institution’s e-learning capability with a view to investing scarce resources strategically and to address weaknesses systematically, rather than in response to advocacy or technological imperatives.

The eMM process set has been developed by an analysis of the factors that appear to drive success in e-learning (Marshall, 2008) and are thus a useful general starting point for improvement activities. Many institutions, however, already have pre-defined strategic and operational priorities for their e-learning activities, and we suggest that a reformulation of the eMM results in a manner that reflects those priorities may be ultimately more persuasive and useful to senior managers. The rest of this paper will explain one possible way this could be done and illustrate the result using a hypothetical institution, but real examples of alternative standards and frameworks used by institutions internationally.

KEY CONCEPTS OF THE EMM METHOD

The underlying idea of maturity models is that the ability of an institution to be effective in a particular area of work is dependent on their capability to engage in high quality processes that are reproducible, sustainable, and able to be built upon. The characteristics of an institution that enable high quality processes are able, to some extent, to be separated from the specific institutional context. This separation means that an e-learning capability analysis can be done independently of the technologies selected and pedagogies applied by institutions, and across sectors.

Capability 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.

Dimensions (Figure 1) describe the capability of a process from the synergistic perspectives of *Delivery, Planning, Definition, Management and Optimisation*.

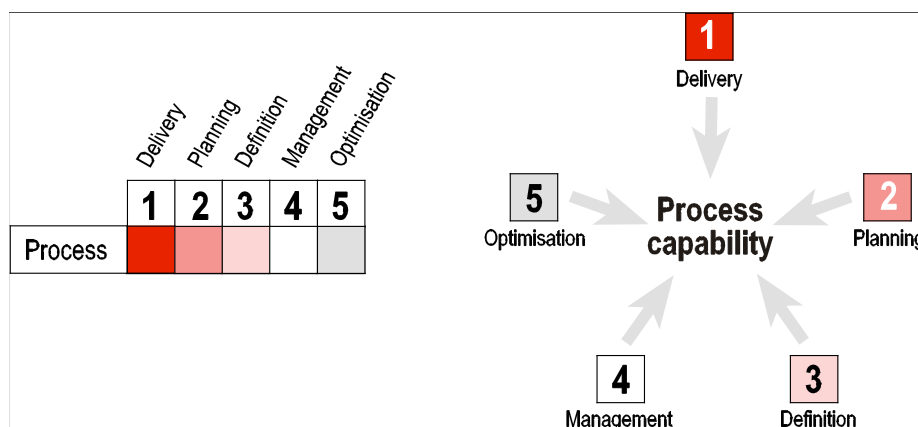


Figure 1: eMM Dimensions

Table 1: eMM version 2.3 processes (revised from Marshall, 2006b)

Learning: Processes that directly impact on pedagogical aspects of e-learning	
L1.	Learning objectives guide the design and implementation of courses.
L2.	Students are provided with mechanisms for interaction with teaching staff and other students.
L3.	Students are provided with e-learning skill development.
L4.	Students are provided with expected staff response times to student communications.
L5.	Students receive feedback on their performance within courses.
L6.	Students are provided with support in developing research and information literacy skills.
L7.	Learning designs and activities actively engage students.
L8.	Assessment is designed to progressively build student 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 by e-learning procedures and standards.
D3.	An explicit plan links e-learning technology, pedagogy and content used in courses.
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.	E-learning resources 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 are provided with library facilities when engaging in e-learning.
S3.	Student enquiries, questions and complaints are collected and managed formally.
S4.	Students are provided with personal and learning support services when engaging in e-learning.
S5.	Teaching staff are provided with e-learning pedagogical support and professional development.
S6.	Teaching staff are provided with technical support in using digital information 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 feedback on the quality and effectiveness of their e-learning experience.
E2.	Teaching staff are able to provide regular feedback on quality and effectiveness of their e-learning experience.
E3.	Regular reviews of the e-learning aspects of courses are conducted.
Organisation: Processes associated with institutional planning and management	
O1.	Formal criteria guide the allocation of resources for e-learning design, development and delivery.
O2.	Institutional learning and teaching policy and strategy explicitly address e-learning.
O3.	E-learning technology decisions are guided by an explicit plan.
O4.	Digital information use is guided by an institutional information integrity plan.
O5.	E-learning initiatives are guided by explicit development plans.
O6.	Students are provided with information on e-learning technologies prior to starting courses.
O7.	Students are provided with information on e-learning pedagogies prior to starting courses.
O8.	Students are provided with administration information prior to starting courses.
O9.	E-learning initiatives are guided by institutional strategies and operational plans.

The *Delivery* dimension is concerned with the creation and provision of process outcomes. The *Planning* dimension assesses the use of predefined objectives and plans in conducting the work of the process. The *Definition* dimension covers the use of institutionally defined and documented standards, guidelines, templates and policies during the process implementation. The *Management* dimension is concerned with how the institution manages the process implementation and ensures the quality of the outcomes. The *Optimisation* dimension captures the extent an institution is using formal and systematic approaches to improve the activities of the process.

The eMM divides the capability of institutions to sustain and deliver e-learning into thirty five processes grouped into five major categories or process areas (Table 1) that indicate a shared concern. 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. Each process in the eMM is broken down within each dimension into practices that define how the process outcomes might be achieved by institutions (Figure 2). 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).



Figure 2: Relationships between processes, practices and dimensions

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 2 lists the practices for the *Delivery* dimension of process L1 (Learning objectives guide the design and implementation of courses). Further information on the development and content of the eMM processes and practices can be found in Marshall (2006, 2008), details of assessment methodology can be found in Marshall and Mitchell (2006, 2007).

Table 2: eMM Process L1 *Delivery* dimension practices (Marshall, 2006)

Dimension	Practices
Delivery	<p>Course documentation includes a clear statement of learning objectives.</p> <p>Learning objectives are linked explicitly throughout learning and assessment activities using consistent language.</p> <p>Learning objectives are linked explicitly to wider programme or institutional objectives.</p> <p>Learning objectives support student outcomes beyond the recall of information.</p> <p>Course workload expectations and assessment tasks are consistent with course learning objectives.</p>

Assessment example

Once the assessment of capability is undertaken, the results can be interpreted. Figure 3 demonstrates some typical results showing a single process capability as assessed for four different hypothetical institutions (one per row).

Process description					
	Delivery	Planning	Definition	Management	Optimisation
Institution A	Light Blue				
Institution B	Dark Blue	Dark Blue			
Institution C	Light Blue		Dark Blue		
Institution D	Black	Dark Blue	Light Blue		

Figure 3: eMM capability assessment example

Looking at the summary assessments in Figure 3, it can be seen that **institution A** is not performing the process well with only evidence of ad-hoc attempts shown by the *Partially Adequate* rating supplied for the *Delivery* dimension and the absence of any capability in the other dimensions.

Institution B is significantly more capable in the process than either institutions A or C with evidence that the process is mostly performed well (the *Largely Adequate* rating at the *Delivery* dimension) and in a planned fashion (the *Largely Adequate* rating of the *Planning* dimension). Note that despite there being evidence of planning, this appears to be done without any attempt for consistency throughout the institution as no capability is shown within the *Definition* dimension.

Institution C on the other hand, while not as capable in the performance of this process as institution B, shows evidence of having defined standards or guidelines for performing the process (the *Definition* dimension). These appear not to be having an impact on actual e-learning projects as shown by the lower assessments for the *Delivery* and *Planning* dimensions.

Institution D shows a pattern of very good performance of the process (*Fully Adequate* rating for the *Delivery* dimension), supported by *Largely Adequate* *Planning* dimension capability and an initial set of standards or guidelines (*Partially Adequate* rating in the *Definition* dimension). This is the expected pattern of capability development, building from a base of process application behaviours that are becoming more standardised as the institution gains more experience.

Further analysis of these example results suggests that institution C will provide potential examples of useful standards, guidelines and policies, while institution D (and to some extent B) will provide individual examples of how to perform the process well. This type of analysis can be used across a number of processes and institutions within a sector to identify potentially useful approaches that are successful in the shared context and which can be adopted by all institutions seeking to build e-learning capability. Systemic weaknesses, where no good practice can be identified in the assessed institutions, present opportunities for potential research or investment within institutions as well as collaborative work within the sector and with regulatory or accrediting bodies. Examination of process areas provides an institution with the ability to identify areas of related weakness that can be addressed strategically. Priorities can be easily identified by either comparison with other institutions, or by comparing process ratings within an institution.

MAPPING THE EMM TO SECTOR AND INSTITUTION FRAMEWORKS

A large variety of documents exist attempting to codify the factors that result in high quality learning and teaching, including with technology. These documents are commonly referred to as standards or guidelines and a list of influential ones is provided in Table 3. The eMM was initially developed by mapping two of these (the Seven Principles, Chickering and Gamson, 1987; The Quality on the Line Benchmarks, IHEP 2000) to a capability maturity model framework (Marshall and Mitchell, 2004) and further work (Marshall, 2008) has mapped more of these documents to the eMM in an attempt to capture the range of activities that drive capability in e-learning.

Table 3: Examples of pedagogical quality standards and guidelines

Teaching, Learning and Technology Group	Seven Principles	http://www.tltgroup.org/programs/seven.html
Council of Regional Accrediting Commissions and the Western Cooperative for Educational Telecommunications (WCET)	Guidelines for the Evaluation of Electronically Offered Certificate and Degree Programs	http://www.wiche.edu/telecom/Guidelines.htm
Western Cooperative for Educational Telecommunications (WCET)	Principles of Good Practice for Electronically Offered Academic Degree and Certificate Programs	http://www.wiche.edu/telecom/projects/balancing/principles.htm
American Distance Education Consortium	ADEC Guiding Principles for Distance Learning	http://www.adec.edu/admin/papers/distance-learning_principles.html
Instructional Telecommunications Council (ITC)	Quality Enhancing Practices in Distance Education	http://www.itcnetwork.org/quality.html
The American Federation of Teachers (AFT)	Distance Education: Guidelines for Good Practice	http://www.aft.org/higher_ed/downloadable/distance.pdf
National Education Association (NEA), Blackboard Inc. and the Institute for Higher Education Policy (IHEP)	Quality on the Line: Benchmarks for Success in Internet-Based Distance Education	http://www.ihep.com/quality.pdf
IMS Learning Design	Specification to describe learning scenarios for reuse or transfer between systems	http://www.imsglobal.org/learningdesign/
Southern Regional Education Board	Principles of Good Practice	http://www.electroniccampus.org/student/sreinfo/publications/principles.asp
Australian National Training Authority	Flexible Learning Toolbox	http://www.flexiblelearning.net.au/toolbox/
FuturEd, Community Association for Community Education (CACE) and the Office of Learning Technologies (OLT) of Human Resources Development Canada (HRDC)	Canadian Recommended E-learning Guidelines (CanREGs)	http://www.futured.com/pdf/CanREGs%20Eng.pdf

Government agencies also use similar documents to communicate their expectations for sectors that receive funding from public sources (for example the British Becta e-strategy balanced scorecard, Becta, 2006), with the added incentive that institutions commonly must demonstrate how they are working to achieve these goals. Similarly, some institutions have expressed for themselves their objectives or values for teaching and learning (for example the Queensland University of Technology Teaching Capability Framework).

Both of these latter examples are likely to have greater currency within the relevant institutions than the generic representation used by the eMM, and are more likely to generate engagement and action by senior managers. In addition, the ability to express an eMM assessment in terms of a framework like that used by Becta is useful for institutions wishing to demonstrate their support of sector strategic priorities and progress in improving areas subject to sector priority funding and support.

Mapping between the eMM and another framework is done by examining each statement in the framework (where necessary breaking it down into single statements) and then looking for a match within the eMM processes, practices and dimensions. A single framework concept commonly will match a single process, practices within processes, a dimension of the eMM or combinations of the three. Visually, the mapping can be summarised using the eMM matrix as shown in Figure 4 below, with red squares indicating a close correspondence, while pink squares indicate that the process and dimension map indirectly. Maps such as these convey the extent to which the eMM covers the aspects of the given framework and can also be used to convey the eMM assessment results in terms of the framework items.

	Becta Summary	Becta Perspective 1	Becta Perspective 2	Becta Perspective 3	Becta Perspective 4
	Optimisation Management Definition Planning Delivery	Optimisation Management Definition Planning Delivery	Optimisation Management Definition Planning Delivery	Optimisation Management Definition Planning Delivery	Optimisation Management Definition Planning Delivery
Learning: Processes that directly impact on pedagogical aspects of e-learning					
L1. Learning objectives guide the design and implementation of courses					
L2. Students are provided with mechanisms for interaction with teaching staff and other students					
L3. Students are provided with e-learning skill development					
L4. Students are provided with expected staff response times to student communications					
L5. Students receive feedback on their performance within courses					
L6. Students are provided with support in developing research and information literacy skills					
L7. Learning designs and activities actively engage students					
L8. Assessment is designed to progressively build student 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 by e-learning procedures and standards					
D3. An explicit plan links e-learning technology, pedagogy and content used in courses					
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. E-learning resources 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 are provided with library facilities when engaging in e-learning					
S3. Student enquiries, questions and complaints are collected and managed formally					
S4. Students are provided with personal and learning support services when engaging in e-learning					
S5. Teaching staff are provided with e-learning pedagogical support and professional development					
S6. Teaching staff are provided with technical support in using digital information 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 feedback on the quality and effectiveness of their e-learning experience					
E2. Teaching staff are able to provide regular feedback on quality and effectiveness of their e-learning experience					
E3. Regular reviews of the e-learning aspects of courses are conducted					
Organisation: Processes associated with institutional planning and management					
O1. Formal criteria guide the allocation of resources for e-learning design, development and delivery					
O2. Institutional learning and teaching policy and strategy explicitly address e-learning					
O3. E-learning technology decisions are guided by an explicit plan					
O4. Digital information use is guided by an institutional information integrity plan					
O5. E-learning initiatives are guided by explicit development plans					
O6. Students are provided with information on e-learning technologies prior to starting courses					
O7. Students are provided with information on e-learning pedagogies prior to starting courses					
O8. Students are provided with administration information prior to starting courses					
O9. E-learning initiatives are guided by institutional strategies and operational plans					

Figure 4: Summary of the eMM-Becta mapping

Mapping the eMM to the Becta e-Strategy Balanced Scorecard

The Becta e-strategy balanced scorecard is a component of their Harnessing Technology Delivery Plan (Becta, 2006) that is intended to improve the quality of technology use by educational providers. It contains 24 items organised into four 'perspectives' which were matched with the eMM as summarised in Table 4.

Table 4: Becta e-Strategy Balanced Scorecard Mapped to the eMM

Perspective 1 Capability and capacity of the workforce, providers and learners:		
1.1A	Leaders have the knowledge to ensure technology for learning can be harnessed for the benefit of learners	Outcome of undertaking an eMM assessment, focus of the Management dimension and processes E1-E3.
1.1B	Leaders have the skills to ensure technology for learning can be harnessed for the benefit of learners	Staff skills are addressed as part of the Definition dimension of processes O1-O3 and O9.
1.2A	Institutions and providers plan technology for learning effectively and sustainably	Processes O1-O3, O5 and O9, Definition dimension of processes D1-D7 and S1-S6.
1.2B	Institutions and providers manage technology for learning effectively and sustainably	Definition, Management and Optimisation dimensions of Development, Support, Evaluation and Organisation processes.
1.3	Practitioners exploit technology consistently to offer engaging and effective learning experiences	Processes D3, O3 and O5.
1.4	Practitioners, parents and learners can share and use information and data effectively for the benefit of learners	Not assessed by the eMM.
1.5	Improved learner capability in using technology to support their learning	Process L3, part of Delivery and Planning dimensions of S1, O6 and O7.
Perspective 2 Fit for purpose technology and systems:		
2.1A	All learners have access to the appropriate technology and digital resources they need for learning	Aspect of processes L10, D5, D6 and S2. Whether or not technology is appropriate is assessed as part of the Management dimension.
2.1B	All practitioners have access to the appropriate technology and digital resources they need for [supporting] learning	Aspect of processes D1, D5 and S5. Whether or not technology is appropriate is assessed as part of the Management dimension.
2.2	Every learner has a personalised learning space to enable them to learn when and where they choose	Aspect of processes L10, D1 and D4.
2.3A	Technology-enabled learning environments are secure	Planning dimension of processes S6 and O4.
2.3B	Technology-enabled learning environments are supported	Processes D1, D5, D6, S1-S6 and aspects of the Management dimension of all processes.
2.3C	Technology-enabled learning environments are interoperable	Process D6, also aspects of processes D2 and O3.
2.4	There is a dynamic, vibrant and responsive technology market that can meet the needs of the system	Not assessed by the eMM.

Perspective 3 Outcomes and benefits for learners and children:		
3.1	There is a greater choice in learning opportunities and modes for all learners	Process L10, also aspects of processes O6 and O7.
3.2	Learners have increased motivation for engagement in learning	Process L7, also aspects of processes L5 and L10.
3.3	Fewer learners under-perform or fail to succeed in education	Not assessed by the eMM.
3.4	An improvement in the quality of learning provision is accelerated	Not directly assessed by the eMM, but a goal of its development and application.
3.5	There is improved child safety and child protection	Not assessed by the eMM.
Perspective 4 Efficiency, effectiveness and value for money across the system:		
4.1	Learning providers collaborate and share information and resources	Not assessed by the eMM.
4.2	The management and administration of learning and institutions is more efficient	Management and Optimisation dimension of all processes.
4.3	There is a greater level of effective, learner-focused assessment for learning	Processes L5 and L8, also aspects of process S6.
4.4	Practitioners collaborate and share good practice and learning resources	Process D7, also aspects of the Planning and Definition dimensions of most processes.
4.5	There is good use of information to support learner transitions between institutions and sectors	Not assessed by the eMM.

Six of the 24 items were not assessed by the eMM as they relate to Becta priorities unrelated to e-learning capability (i.e. 3.5 “There is improved child safety and child protection”). Looking at this from the perspective of the eMM results in the mapping summarised in Figure 4. This shows that evidence of capability in the items covered by Perspective 1 (“Capability and capacity of the workforce, providers and learners”) can be found in a number of places in the eMM, consistent with the intent of that perspective aligning with the goal of the eMM as a whole.

Other perspectives map much more specifically to a fewer number of processes (for example Perspective 3 “Outcomes and benefits for learners and children” maps most strongly to processes L7 “Learning designs and activities actively engage students” and L10 “Courses are designed to support diverse learning styles and learner capabilities” of the eMM, again consistent with the specific focus of that perspective and the particular eMM process objectives.

A more detailed document outlining the individual item mappings is available from <http://www.utdc.vuw.ac.nz/research/emm/mappings/20080102Becta.pdf>.

The strong correspondence between the eMM and the Becta scorecard shown by the largely red coverage in Figure 4 reflects the wide scope of the Becta framework and its focus on capability in technology use. Not all sector frameworks would map as comprehensively, particularly if they focused specifically on learning outcomes or on technology use rather than on holistic capability of institutions in e-learning.

Mapping the eMM to the Queensland University of Technology Teaching Capability Framework

Institutional conceptions of quality in learning and teaching also exist, such as that created by the Queensland University of Technology (QUT) in their Teaching Capability Framework (TCF; <http://www.talss.qut.edu.au/about/publications/tcf.pdf>). This contains 98 items organised into four areas, “1: Engaging Learners,” “2: Designing for Learning,” “3: Assessing for Learning,” and “4: Managing for Learning.” A document outlining the mapping from these items to the eMM is provided online (<http://www.utdc.vuw.ac.nz/research/emm/mappings/QUTTCF.pdf>), and Figure 5 shows a summary of the mapping from the eMM.

	QUT TCF Summary	QUT TCF 1	QUT TCF 2	QUT TCF 3	QUT TCF 4
	Optimisation Management Definition Planning Delivery	Optimisation Management Definition Planning Delivery	Optimisation Management Definition Planning Delivery	Optimisation Management Definition Planning Delivery	Optimisation Management Definition Planning Delivery
Learning: Processes that directly impact on pedagogical aspects of e-learning					
L1.Learning objectives guide the design and implementation of courses	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed
L2.Students are provided with mechanisms for interaction with teaching staff and other students	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed
L3.Students are provided with e-learning skill development	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed
L4.Students are provided with expected staff response times to student communications	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed
L5.Students receive feedback on their performance within courses	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed
L6.Students are provided with support in developing research and information literacy skills	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed
L7.Learning designs and activities actively engage students	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed
L8.Assessment is designed to progressively build student competence	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed
L9.Student work is subject to specified timetables and deadlines	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed
L10.Courses are designed to support diverse learning styles and learner capabilities	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed
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	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed
D2.Course development, design and delivery are guided by e-learning procedures and standards	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed
D3.An explicit plan links e-learning technology, pedagogy and content used in courses	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed
D4.Courses are designed to support disabled students	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed
D5.All elements of the physical e-learning infrastructure are reliable, robust and sufficient	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed
D6.All elements of the physical e-learning infrastructure are integrated using defined standards	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed
D7.E-learning resources are designed and managed to maximise reuse	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed
Support: Processes surrounding the support and management of e-learning					
S1.Students are provided with technical assistance when engaging in e-learning	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed
S2.Students are provided with library facilities when engaging in e-learning	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed
S3.Student enquiries, questions and complaints are collected and managed formally	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed
S4.Students are provided with personal and learning support services when engaging in e-learning	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed
S5.Teaching staff are provided with e-learning pedagogical support and professional development	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed
S6.Teaching staff are provided with technical support in using digital information created by students	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed
Evaluation: Processes surrounding the evaluation and quality control of e-learning through its entire lifecycle					
E1.Students are able to provide regular feedback on the quality and effectiveness of their e-learning experience	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed
E2.Teaching staff are able to provide regular feedback on quality and effectiveness of their e-learning experience	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed
E3.Regular reviews of the e-learning aspects of courses are conducted	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed
Organisation: Processes associated with institutional planning and management					
O1.Formal criteria guide the allocation of resources for e-learning design, development and delivery	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed
O2.Institutional learning and teaching policy and strategy explicitly address e-learning	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed
O3.E-learning technology decisions are guided by an explicit plan	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed
O4.Digital information use is guided by an institutional information integrity plan	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed
O5.E-learning initiatives are guided by explicit development plans	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed
O6.Students are provided with information on e-learning technologies prior to starting courses	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed
O7.Students are provided with information on e-learning pedagogies prior to starting courses	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed
O8.Students are provided with administration information prior to starting courses	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed
O9.E-learning initiatives are guided by institutional strategies and operational plans	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed	Explicitly addressed

<input type="checkbox"/>	Not addressed
<input type="checkbox"/>	Partially addressed
<input checked="" type="checkbox"/>	Explicitly addressed

Figure 5: Summary of the eMM-QUT-TCF mapping

As with the Becta scorecard, the QUT TCF specifies capability in a manner consistent with the eMM’s conception of capability and thus the mapping is largely red.

APPLICATION OF THE EMM MAPPING TO A HYPOTHETICAL INSTITUTION

In the introduction we noted that these mappings could be used to express an eMM capability assessment in terms of the sector or institutional framework. In this section we outline how this might be done using the assessment of a hypothetical institution, the University of the South Pole (USP), so as to protect the confidentiality of the institutions that have been assessed. Full assessment results from real institutions (without the mapping illustrated in this paper) are presented elsewhere (Marshall, 2008; Marshall and Mitchell, 2007). The documents used to make this hypothetical assessment and the fully worked example are available online here: <http://www.utdc.vuw.ac.nz/research/emm/USPExample.shtml>.

Figures 6 and 7 show the results of the eMM assessment along with summary mappings of that assessment against the Becta scorecard and the QUT TCF as described above.

	Becta Summary	USP	USP	USP Becta Perspective 1	USP Becta Perspective 2	USP Becta Perspective 3	USP Becta Perspective 4
	Optimisation Management Definition Planning Delivery	Optimisation Management Definition Planning Delivery	Optimisation Management Definition Planning Delivery	Optimisation Management Definition Planning Delivery	Optimisation Management Definition Planning Delivery	Optimisation Management Definition Planning Delivery	Optimisation Management Definition Planning Delivery
Learning: Processes that directly impact on pedagogical aspects of e-learning							
L1. Learning objectives guide the design and implementation of courses							
L2. Students are provided with mechanisms for interaction with teaching staff and other students							
L3. Students are provided with e-learning skill development							
L4. Students are provided with expected staff response times to student communications							
L5. Students receive feedback on their performance within courses							
L6. Students are provided with support in developing research and information literacy skills							
L7. Learning designs and activities actively engage students							
L8. Assessment is designed to progressively build student 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 by e-learning procedures and standards							
D3. An explicit plan links e-learning technology, pedagogy and content used in courses							
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. E-learning resources 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 are provided with library facilities when engaging in e-learning							
S3. Student enquiries, questions and complaints are collected and managed formally							
S4. Students are provided with personal and learning support services when engaging in e-learning							
S5. Teaching staff are provided with e-learning pedagogical support and professional development							
S6. Teaching staff are provided with technical support in using digital information 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 feedback on the quality and effectiveness of their e-learning experience							
E2. Teaching staff are able to provide regular feedback on quality and effectiveness of their e-learning experience							
E3. Regular reviews of the e-learning aspects of courses are conducted							
Organisation: Processes associated with institutional planning and management							
O1. Formal criteria guide the allocation of resources for e-learning design, development and delivery							
O2. Institutional learning and teaching policy and strategy explicitly address e-learning							
O3. E-learning technology decisions are guided by an explicit plan							
O4. Digital information use is guided by an institutional information integrity plan							
O5. E-learning initiatives are guided by explicit development plans							
O6. Students are provided with information on e-learning technologies prior to starting courses							
O7. Students are provided with information on e-learning pedagogies prior to starting courses							
O8. Students are provided with administration information prior to starting courses							
O9. E-learning initiatives are guided by institutional strategies and operational plans							

Not addressed

Partially addressed

Explicitly addressed

No capability, partial mapping

Partially adequate, partial mapping

Largely adequate, partial mapping

Fully adequate, partial mapping

No capability, full mapping

Partially adequate, full mapping

Largely adequate, full mapping

Fully adequate, full mapping

Figure 6: Summary of the eMM Becta mapping of the USP assessment

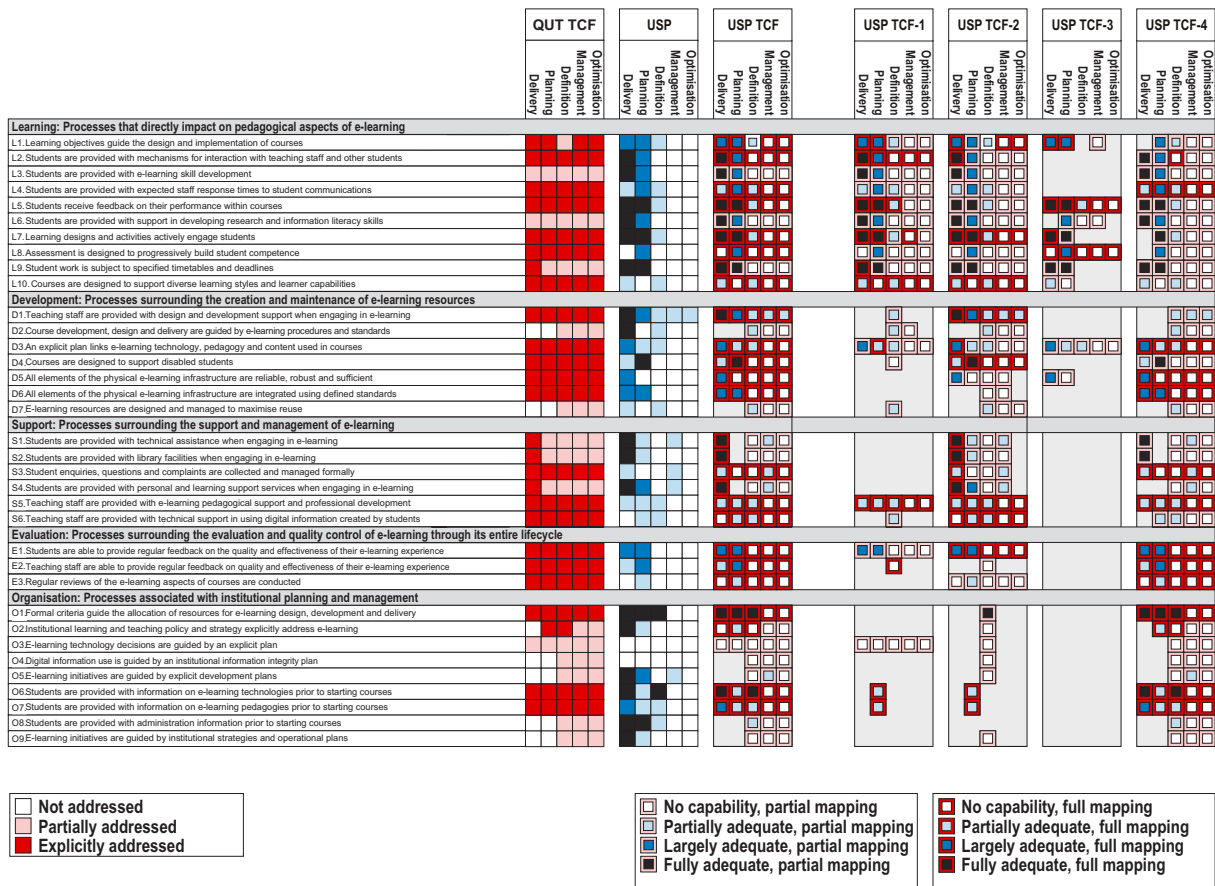


Figure 7: Summary of the eMM QUT-TCF mapping of the USP assessment

The differences in coverage between the two frameworks are reflected in the results shown here. The USP assessment shows a lack of capability in the *Definition*, *Management* and *Optimisation* dimensions of most processes and consequently the institution is assessed poorly under the Becta scorecard which is dominated by items that map to the *Definition* dimension, particularly in the *Development* and *Support* process areas. This results in a particularly low assessment across Perspective 2 of the Becta scorecard “Fit for purpose technology and systems” reflecting the lack of systemic engagement in e-learning apparent from the weak *Definition* assessment under the eMM. In both frameworks, the weak capability in the *Evaluation* processes is also apparent.

Further information can also be extracted by examining the individual item capabilities as illustrated by Figures 8 and 9. Figure 8 shows a single item mapping from the QUT TCF to the eMM where there is a clear match between the TCF item and the *Planning* dimension of four processes. The mix of assessments, three partially and one largely adequate, suggest that there is significant room for improvement in capability in this item.

	1.8				USP					
	Optimisation	Management	Definition	Planning	Delivery	Optimisation	Management	Definition	Planning	Delivery
Learning: Processes that directly impact on pedagogical aspects of e-learning										
L1. Learning objectives guide the design and implementation of courses										
L2. Students are provided with mechanisms for interaction with teaching staff and other students										
L3. Students are provided with e-learning skill development										
L4. Students are provided with expected staff response times to student communications										
L5. Students receive feedback on their performance within courses										
L6. Students are provided with support in developing research and information literacy skills										
L7. Learning designs and activities actively engage students										
L8. Assessment is designed to progressively build student 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 by e-learning procedures and standards										
D3. An explicit plan links e-learning technology, pedagogy and content used in courses										
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. E-learning resources 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 are provided with library facilities when engaging in e-learning										
S3. Student enquiries, questions and complaints are collected and managed formally										
S4. Students are provided with personal and learning support services when engaging in e-learning										
S5. Teaching staff are provided with e-learning pedagogical support and professional development										
S6. Teaching staff are provided with technical support in using digital information 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 feedback on the quality and effectiveness of their e-learning experience										
E2. Teaching staff are able to provide regular feedback on quality and effectiveness of their e-learning experience										
E3. Regular reviews of the e-learning aspects of courses are conducted										
Organisation: Processes associated with institutional planning and management										
O1. Formal criteria guide the allocation of resources for e-learning design, development and delivery										
O2. Institutional learning and teaching policy and strategy explicitly address e-learning										
O3. E-learning technology decisions are guided by an explicit plan										
O4. Digital information use is guided by an institutional information integrity plan										
O5. E-learning initiatives are guided by explicit development plans										
O6. Students are provided with information on e-learning technologies prior to starting courses										
O7. Students are provided with information on e-learning pedagogies prior to starting courses										
O8. Students are provided with administration information prior to starting courses										
O9. E-learning initiatives are guided by institutional strategies and operational plans										

Figure 8: Result of the eMM-QUT-TCF mapping of the USP assessment for item 1.8 ‘design learning experiences that are challenging and relevant to unit objectives’

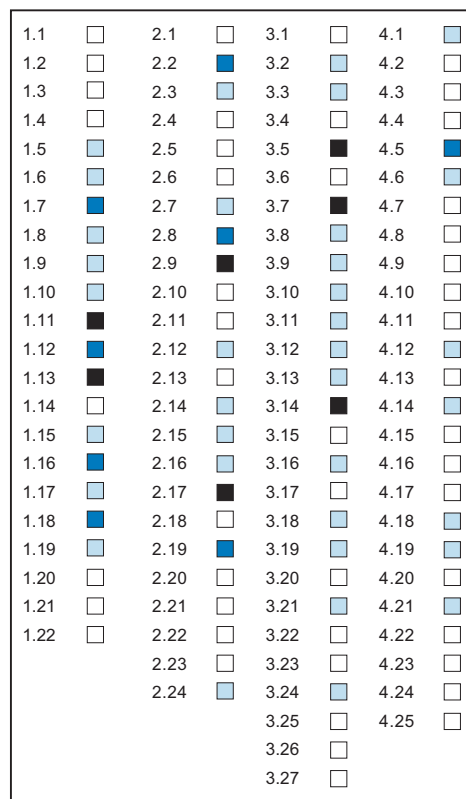
	1.3a				1.3b				USP			
	Optimisation	Management	Definition	Delivery	Optimisation	Management	Definition	Delivery	Optimisation	Management	Definition	Delivery
Learning: Processes that directly impact on pedagogical aspects of e-learning												
L1. Learning objectives guide the design and implementation of courses												
L2. Students are provided with mechanisms for interaction with teaching staff and other students												
L3. Students are provided with e-learning skill development												
L4. Students are provided with expected staff response times to student communications												
L5. Students receive feedback on their performance within courses												
L6. Students are provided with support in developing research and information literacy skills												
L7. Learning designs and activities actively engage students												
L8. Assessment is designed to progressively build student 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 by e-learning procedures and standards												
D3. An explicit plan links e-learning technology, pedagogy and content used in courses												
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. E-learning resources 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 are provided with library facilities when engaging in e-learning												
S3. Student enquiries, questions and complaints are collected and managed formally												
S4. Students are provided with personal and learning support services when engaging in e-learning												
S5. Teaching staff are provided with e-learning pedagogical support and professional development												
S6. Teaching staff are provided with technical support in using digital information 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 feedback on the quality and effectiveness of their e-learning experience												
E2. Teaching staff are able to provide regular feedback on quality and effectiveness of their e-learning experience												
E3. Regular reviews of the e-learning aspects of courses are conducted												
Organisation: Processes associated with institutional planning and management												
O1. Formal criteria guide the allocation of resources for e-learning design, development and delivery												
O2. Institutional learning and teaching policy and strategy explicitly address e-learning												
O3. E-learning technology decisions are guided by an explicit plan												
O4. Digital information use is guided by an institutional information integrity plan												
O5. E-learning initiatives are guided by explicit development plans												
O6. Students are provided with information on e-learning technologies prior to starting courses												
O7. Students are provided with information on e-learning pedagogies prior to starting courses												
O8. Students are provided with administration information prior to starting courses												
O9. E-learning initiatives are guided by institutional strategies and operational plans												

Figure 9: Result of the eMM-QUT-TCF mapping of the USP assessment for item 1.3 ‘implement and, where applicable, influence policies and practices related to improved quality of teaching and learning, course design and conceptions of teaching’

Figure 9 shows another TCF item that is mapped in two parts to the *Definition* and *Management* dimensions of the Learning process area as well as processes D2 and D3. While the correspondence here is not as specific as that in Figure 8, the very low assessments shown suggest that this item is also in need of improvement.

Finally, it is possible to summarise the results for each item by averaging the eMM capability assessments for all mapped items and presenting the results in a table such as that shown in Figure 10.

Figure 10: Average eMM QUT TCF assessments for the USP



This provides a simplified overview that, combined with reference to the detailed charts, may be more useful in identifying possible priority areas. In this example the Managing for Learning items (area 4 on the right of Figure 10) are clearly weaker overall and suggest that the hypothetical institution should consider leadership and management aspects of e-learning as a high priority, although clearly the dominance of light blue *Partly Adequate* assessments suggests that many other aspects need improvement as well.

The decision as to which item should receive attention first is one that individual institutions need to determine for themselves. The eMM does not provide an inherent mechanism for setting priorities, however it does provide through its lists of detailed practices a mechanism for planning improvement activities.

CONCLUSION

The eMM has been successfully applied to many institutions internationally and the resulting capability visualisations are being used actively to analyse institutional and sector capabilities. This paper has illustrated a further use of the eMM information as a tool for visualising the progress that institutions are making towards measures of success defined either by funding agencies or by the institutions themselves. We hope that institutions will see the advantage of not only expressing goals for their e-learning activities, but also using evidence from tools like the eMM to help guide and focus continuous improvement towards the attainment of those goals.

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