

What are the key factors that lead to effective adoption and support of e-learning by institutions?

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Assessment of institutional performance is more commonly encountered through the use of performance indicators claiming to audit quality and efficiency, and therefore demonstrating accountability. Often these performance indicators are chosen for convenience and cost rather than their reflecting the understanding and experience of practitioners. The E-Learning Maturity Model (eMM) provides a means by which institutions can assess their e-learning capability in a number of processes that have been selected through a combination of research and consultation with groups internationally. This paper presents the results of the consultation on the key institutional practices needed for successful e-learning and which are measured by the eMM.

Keywords: guidelines, publishing formats, procedures (give three keywords)

Introduction

Educational institutions have been subjected to a variety of performance measures over the last thirty years (Clift *et al*, 1987; Sizer 1988; Cave *et al*, 1991; Alexander 2000; Kuh 2007). Over this time a rising culture of accountability in public life has seen a significant increase in the range of indicators being collected and reported upon.

Many of these measures have been criticised for their focus on ranking and ease of measurement, rather than their reflecting fundamental factors relating to successful outcomes for students, communities and institutions. Often pressure is placed on academics to improve the directly measured outcome, rather than engaging with the wider educational and institutional context including the goals of students and institution that produce the measured results as a symptom (Taylor 2001). Performance indicators are generally, by their very nature, abstractions of a more complex set of measures which are simplified and presented in a manner that is intended to support decision making, preferably on an objective basis (Laurillard 1980; Frackman 1987).

The E-Learning Maturity Model (eMM, Marshall & Mitchell 2007) is a quality improvement framework with which institutions can assess and compare their capability to sustainably develop, deploy and support e-learning. In order to ensure that the eMM facilitates improvement rather than measurement, the model is based on process improvement methodologies, notably the Capability Maturity Model (CMM, Paulk *et al*, 1993) and SPICE (Software Process Improvement and Capability dEtermination, El Emam *et al*, 1998; SPICE 2002).

The assessment of capability by the eMM depends on a set of key e-learning processes and practices that are measured during an assessment (Marshall 2005). As well as being measurable, these processes and practices are also intended to be guides for future action; suggestions for activities that can improve outcomes for students, staff and the institution. Identifying these processes and practices was a significant challenge in the development of the eMM. 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 what constitutes effective e-learning is a moving target. This continuous change means that the aspects of institutional e-learning performance measured by the eMM must inevitably evolve themselves.

Identifying key performance indicators is a significant challenge, as the research literature tends to trail current understanding in the field of e-learning, and well-founded empirical studies tend to be produced well after current practice has moved on. Accurate and timely information on the effective use of technology to support education thus lies primarily in the heads and daily activities of those engaged in the design, development, delivery, support and management of e-learning. Taylor (2001) noted that staff involved in the daily work of the university, in addition to their collegial responsibility and right to be involved, have both the knowledge and interest needed to inform the development of performance indicators. As noted by Coates:

“Performance indicators shape quality considerations, in many ways, and it is important to ensure that they are salient, sufficient and sound. An important part of enhancing the quality of teaching and learning is enhancing the measures on which quality judgements are made.” (Coates 2007, p92)

In an attempt to capture practitioner’s knowledge and experiences and use them to evolve the eMM, a series of workshops were held in Australia and the United Kingdom. These workshops generated a set of potential performance indicators. In synthesizing these potential performance indicators into the current set a representation of the communal and collegial understanding of e-learning performance has been created. This set is now available online for the community of e-learning practitioners to critique and further develop, while the eMM provides a framework for assessing performance of these indicators and guiding improvement.

Collection of performance indicators at the international workshops

Three workshops were held internationally: in Melbourne in association with an ACODE (Australasian Council on Open and Distance Education, <http://www.acode.edu.au/>) meeting (attended by 23 people); at the 2005 ASCILITE (Australasian Society for Computers in Learning in Tertiary Education) conference in Brisbane (attended by 6 people); and at the University of Manchester, UK (attended by 15 people). Participants came from a wide range of backgrounds and institutions and included academics, librarians, technologists and managers.

The workshops provided participants with an introduction to the eMM and the associated concepts and an opportunity to collectively brainstorm the ways by which institutions can ensure that e-learning is effective and high quality. Participants were encouraged to simply make statements without any attempt to make these measurable

or to otherwise constrain their reflections and creativity. The physical results of the workshop brainstorming sessions were a number of A3 sheets of paper containing the collected and organised ideas of the participants on post-it notes. These were transcribed and aggregated by process area in order to capture the individual ideas for further analysis.

Ethical approval was obtained from the Victoria University of Wellington Human Ethics Committee to conduct these workshops.

Overview of the eMM

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*.

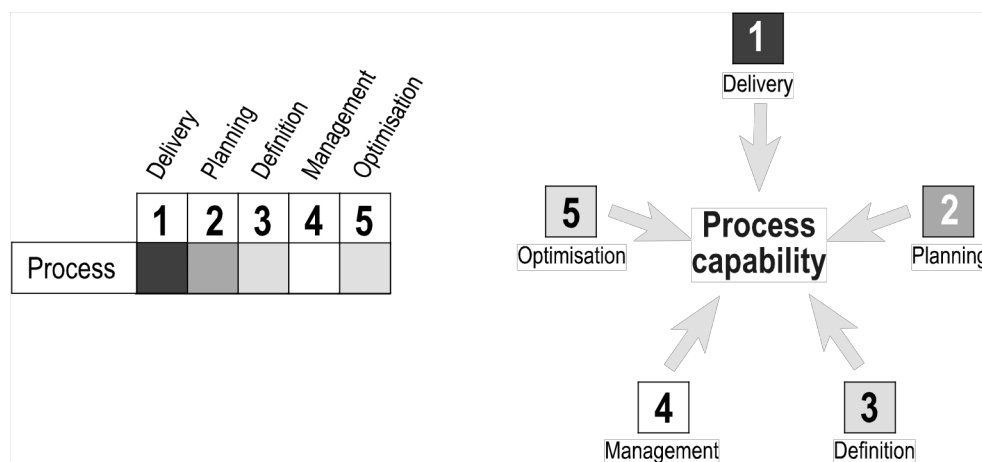


Figure 1: eMM Dimensions

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 processes into five major categories or process areas (Table 1) 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.

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

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
Support	Processes surrounding the support of students and staff engaged in 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

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).



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).

Table 2: eMM Version Two 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>

Further information on the eMM processes and practices can be found in Marshall (2006).

Workshop outcomes

Participants in the workshops provided a total of 635 individual items. These ranged from basic statements such as “Central academic support” through to specific activities “Foster ‘buddy’ relationships in given academic areas e.g. 2-3 staff work together.” When duplicates were removed, a total of 354 unique items were identified. These items were analysed and sorted by the eMM dimensions and process areas as shown in Table 3.

Table 3: Summary of Item Alignments for All Three Workshops

Process Area	Dimension					Total unique items	Total items
	Delivery	Planning	Definition	Management	Optimisation		
Learning	35	14	4	2	0	55	62
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
Total:	167 (47%)	99 (28%)	57 (16%)	30 (8%)	1 (0.3%)	354	635

The detailed tables listing all of the workshop results are available online as part of the discussion wiki at this URL:

<http://www.utdc.vuw.ac.nz/emmWiki/index.php/HERDSA2008>. This alignment was not done as part of the workshop, but rather was conducted as part of the evolution of the current version of the eMM. Consequently every item provided at the workshops has been matched with a corresponding process and practice statement from the current version. This alignment allowed for multiple matches so the same item may appear in more than one process and dimension, as can the eMM practice statements.

An example of the detailed alignment information is given in Table 4. This shows the workshop items that were associated with a given process, grouped by similar concept, which is then linked with the current practice statement within a dimension of the process. The ten items on the left were transcribed from the workshop brainstorming exercises and have been mapped to the eMM practice statement “Specialist staff support the use of e-learning design and (re)development procedures” which is part of the *Planning* dimension of process D1.

Table 4: Example of Workshop Item Alignment with eMM Version 2.3 Process D1

D1. Teaching staff are provided with design and development support when engaging in e-learning.	Delivery	Planning	Definition	Management	Optimisation
<p>Specialist staff support the use of e-learning design and (re)development procedures.</p> <p>Central support unit to act as reference/support group. It could be the sole unit or work with decentralised units</p> <p>Central support systems.</p> <p>Central academic support.</p> <p>Central coordination of support for use of the technology (across organisations units).</p> <p>Knowledge, skill, expertise in specialist staff (maybe centralised T&L units or otherwise).</p> <p>Educational developers to work with staff.</p> <p>Materials development people identified/connected/[linked]/ to/by facilities</p> <p>Coaching model, go for long haul 9-18 months.</p> <p>Coaching model, 1 support staff [to] 12 teaching academics.</p> <p>Collaborative approach to T&L e-technology implementation.</p>					

Once the items were assigned to processes in this way, it was possible to analyse the results by process area and gain an insight into the types of concerns that participants had regarding the support of e-learning by institutions. Table 3 shows the relative paucity of items from the workshops addressing the *Definition*, *Management* and *Optimisation* dimensions. This may reflect in part the way that e-learning has been undertaken in many institutions, essentially following the ‘innovation’ approach described by Rogers (2003). Alternatively, it may simply be the operational focus of the workshop participants with the *Management* and *Optimisation* dimension aspects subsumed into more general points.

The items suggested in the workshops that were mapped to the *Management* dimension were dominated by generic comments about the need for quality control and measurement mechanisms. The cluster of items in the *Management* dimension of the *Evaluation* area reflected a strongly expressed desire that evaluation and feedback information be widely shared, rather than kept confidential to management or technical areas.

A summary of the results by process area is presented in the sections that follow.

Learning

Given the focus on learning rather than technology that dominates modern e-learning discourse, it is interesting that this area attracted rather fewer items than most of the others, only just beating the rather more focused *Evaluation* process area which has far fewer processes (3 vs 10 for *Learning*). The main focus of the participants mapped to process L3 (Students are provided with e-learning skill development). In addition, the need to communicate learning objectives “Clear learning objectives, personal transferable outcomes & academic skill outcomes” and participation was apparent “Expectations should be communicated to students regarding their participation online”. “Undertaking thorough surveys of student needs both for knowledge aspects and delivery aspects” was noted in the *Management* dimension. Many of the items also mapped to processes in the *Support* area, consistent with an overall focus on support issues.

The absence of more items in the *Learning* process area may reflect the sense that many of the processes are the responsibility of individual teachers, a sense by participants that learning is already well addressed, or merely the focus of the interests of the participants on organisational aspects. Nevertheless, given the frequent comment on the need to focus on learning when discussing e-learning it is interesting that more items were not identified.

Development

The *Development* area received much more attention from the participants. Process D1 (Teaching staff are provided with design and development support when engaging in e-learning) had the most items, but as with process L3, this appears to reflect in part the focus on support issues as many of the items overlapped with staff support processes.

A number of participants provided items mapping to the *Development* area discussing the need for “adequate ongoing staff support” provided by specialist staff organised in a coherent or centralized way. Process D5 (All elements of the physical e-learning infrastructure are reliable, robust and sufficient) attracted a large proportion of items predominantly expressed at the *Delivery* dimension. These seem to express a distrust in the reliability and robustness of e-learning systems “The technology ‘just works.’”

The need for effective support “At elbow training for academics (rapid response team)” involving a range of skills and perspectives “Integrated teams (academic, support & library) to develop courses” was noted clearly in process D1 (Teaching staff are provided with design and development support when engaging in e-learning) but with a concern that the focus be on academic rather than business outcomes “Consider how you can sell me ‘real’ story not the ‘efficient’ story corporate affairs would prefer”.

Support

Support was easily the area with the most ideas proposed. In part this appears to reflect the expression of the items in general terms that covered all or most of the processes in this area such as “technical support for students” and “library support for learners”. There were also a large number of similar or duplicate items reflecting a shared set of concerns by the participants.

Many items mapped to only two processes S5 (Teaching staff are provided with e-learning pedagogical support and professional development) and S6 (Teaching staff are provided with technical support in using digital information created by students). Most of these items were focused on the availability of “at elbow” professional development support and assistance although the need for evidence based practice was clearly noted with items such as “Establish exemplars of best practice of e-learning”, “Research led L&T encouraged” and “Teachers are given time to think, do, evaluate and reflect”.

Evaluation

In contrast to *Support*, the *Evaluation* process area was almost ignored. Comparatively few items were noted and although these matched the higher dimensions disproportionately this appears to be an artifact of the overlap between the definitions of the dimensions and the processes.

Evaluation process area items noted the need to get student feedback “There is real feedback of aspects of course performance (learning activity, assessment) to planning” but also to actively engage them in the improvement process “Developing partnerships with staff and students”. The need for quality enhancement processes was strongly expressed in several items noting the need for continuous enhancement “Embedded quality enhancement process” and the need to support innovation “Quality processes must facilitate innovation in e-learning”. The need to use feedback information both to inform “Evaluation of innovations & changes to understand their impact” but also to celebrate effective teaching “Celebrating teaching forums” was also clear.

Organisation

The need for an e-learning strategy dominated the items mapped to the *Organisation* process area along with the need to ensure that strategies and policies are used throughout the organisation “Policy and policies are disseminated meaningfully to practitioners and practitioners buy-in to policy and policies”. As with the *Evaluation* process area, the need for support of innovation was noted “Work towards change. We live in a change culture” and “Allow for flexibility/adaptability of processes/policies/procedures”. This was not however seen as solely an academic or managerial concern “Student experience is seen as the responsibility of all institutional staff”.

Key ideas included that “there must be a clear institutional view about what the purpose of e-learning opportunities might be” supported by clear definitions and policy, and the strongly expressed need for a “shared vision about what it means to the institution and what it will do”. The need for “appropriate and timely funding” was noted along with the need for well informed “Managers admit they need to learn about this and stop doing ‘nothing’ because it feels safer” and clear leadership “Get executive ownership of e-learning direction at an institutional level” with a clear academic focus “Stop [educational] decisions being made by managers[/IT experts]”.

Interestingly, many of the operational aspects that are part of this process area received little attention (for example O8: Course administration information communicated to students prior to starting courses). As with the *Evaluation* area, this may reflect the sense that existing administrative procedures and systems are well equipped to address e-learning or simply the composition of the workshop attendees.

Interestingly, the items covering student information and preparation needs (O6-O8) were only expressed in terms of actions by the students.

Conclusion

As practitioners, we need the ability to contribute to any discussion of performance indicators if they are to reflect the rich diversity and rapid change of e-learning, rather than the convenience of external agencies intent on ranking and cost-cutting. Paraphrasing an earlier paper on Standards (Marshall 2004) performance indicators “need to be more than a means of demonstrating compliance or supporting technology:

- [they] must reflect the diversity of student learning capabilities and desired outcomes;
- [they] must evolve to meet the challenges of new forms of technology, and new types of pedagogy, and ideally they should stimulate the discussion, application and research that result in that evolution;
- [they] must be enablers of effective practice rather than constraints on the creativity and burdens to the passion of teachers;
- [they] must reflect an evidence base of effective teaching practice and research into ways of improving student learning;
- [they] must be expressed in a way that enables efficient determination of compliance and an ability to “benchmark” or document that compliance;
- [they] must support the management of institutions in identifying areas in need of development and strategic decisions about e-learning directions for the institution as a whole”

The intention of the workshops was to gather a set of key factors that contribute towards effective use of e-learning technologies and pedagogies by institutions. The information gathered provides a snapshot of factors that people engaged in the day-to-day use of e-learning feel their institutions should be focusing on. These factors have been mapped onto the eMM framework illustrating how this information is being used to maintain the currency of the performance indicators used by the eMM, and also providing a framework for using these items to drive improvements in the institutional use of technology for learning.

This paper, and the associated detailed analysis have been published on a wiki at this address: <http://www.utdc.vuw.ac.nz/emmWiki/index.php/HERDSA2008>. The intention is to maintain this as a means of opening the eMM indicators up for criticism and ongoing development, maintaining the value of the processes and practices as a tool for continuous improvement owned by practitioners.

References

- Alexander, J.F. (2000). The Changing Face of Accountability: Monitoring and Assessing Institutional Performance in Higher Education’. *The Journal of Higher Education* 71(4), 411-431
- Cave, M., Hanney, S., & Kogan, M. (1991). *The use of performance indicators in higher education* (2nd ed.). London, UK: Jessica Kingsley Publishers.
- Clift, J., Hall, C., Turner, I. (1987). Establishing the validity of a set of summative teaching performance scales’. *Assessment and Evaluation in Higher Education* 14(3),193-206.
- Coates, H., 2007, ‘Excellent measures precede measures of excellence’. *Journal of Higher Education Policy and Management* 29(1), 87-94.

- El Emam, K., Drouin, J-N. & Melo, W. (1998). *SPICE: The theory and practice of software process improvement and capability determination*, California: IEEE Computer Society.
- Frackman, E. (1987). Lessons to be Learnt from a Decade of Discussions on Performance Indicators. *International Journal of Institutional Management in Higher Education*, 11(2).
- Kuh, G. (2007). Risky Business: Promises and Pitfalls of Institutional Transparency, *Change: The Magazine of Higher Learning* 39(5), 30-35.
- Laurillard, D. M. (1980). Validity of Indicators of Performance. In D. Billing (Ed.), *Indicators of Performance: fifteenth annual conference of the Society for Research into Higher Education 1979*. The Society of Research into Higher Education.
- Marshall, S. (2005). *Determination of New Zealand tertiary institution e-learning capability: An application of an e-learning maturity model: Report on the e-learning maturity model evaluation of the New Zealand tertiary sector*, Report to the New Zealand Ministry of Education. 132pp. Retrieved January 10, 2006, from <http://www.utdc.vuw.ac.nz/research/emm/documents/SectorReport.pdf>
- Marshall, S. (2006), *eMM Version two process guide*, Wellington: Victoria University of Wellington.
- Marshall, S. & Mitchell, G. (2006). Assessing sector e-learning capability with an e-learning maturity model. Proceedings of the Association for Learning Technologies Conference, 2006, Edinburgh, UK.
- Marshall, S.J. & Mitchell, G. (2007). Benchmarking International E-learning Capability with the E-Learning Maturity Model. In Proceedings of EDUCAUSE in Australasia 2007, 29 April – 2 May 2007, Melbourne, Australia. Retrieved February 26, 2008, from http://www.caudit.edu.au/educauseaustralasia07/authors_papers/Marshall-103.pdf
- Paulk, M Curtis, B et al. (1993). Capability Maturity Model, Version 1.1, *IEEE Software* 10(4), 18-27.
- Rogers, E. M. (2003). *Diffusion of innovations* (5th ed.). New York: Free Press.
- Sizer, J. (1988). In Search of Excellence - Performance Assessment in the United Kingdom'. *Higher Education Quarterly* 42(2), 152-161
- SPICE (2002). *Software process assessment version 1.00*. Retrieved December 18, 2002, from <http://www-sqi.cit.gu.edu/spice/>.

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