



Crossing the ditch: Applying the e-learning maturity model to Australian institutions

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The e-learning maturity model (eMM) provides institutions with detailed information on their e-learning activities. This paper describes the pilot application of the eMM to two large Australian universities and suggests that disciplinary differences taking place in different spaces may be more consistent in their use of e-learning than is generally acknowledged. The eMM is also compared with the Australian developed ACODE benchmarks and the complementary benefits of both processes discussed.

Keywords: e-learning, eMM, ACODE Benchmarks, Maturity Models, CMM, SPICE, process improvement.

Introduction

The e-learning Maturity Model (eMM; Marshall and Mitchell, 2002) is a benchmarking and quality improvement framework developed in New Zealand and validated both nationally and internationally as a tool for informing and guiding the systematic improvement of e-learning by institutions. The eMM uses the maturity model concepts developed originally by software engineers (Paulk et al., 1993; El Emam et al., 1998; SPICE, 2002) to frame an analysis of institutional e-learning capability and provide assessments of areas of strength and weakness that can guide institutions and sector agencies.

Workshops were run in New Zealand, Australia and the United Kingdom as part of the original validation of the items used by the eMM to assess e-learning capability (Marshall, 2006a; 2008). These workshops helped identify key factors that expert practitioners felt contributed to sustainable and effective e-learning. Projects in both New Zealand (Marshall 2005; 2006a) and the United Kingdom (Bacsich, 2008) have seen the eMM applied to a range of institutions in both the vocational and higher education sectors. Until recently, however, no Australian institutions have been assessed formally with the eMM.

This paper presents an initial assessment of capability undertaken in two Australian universities, members of the Australasian Council of Open and Distance Education (ACODE) organization. In addition, as part of the pilot, the relationship between the eMM and the ACODE benchmarks was explored. This paper discusses the relationship between the two frameworks and the implications for those intending to make use of either. This work was undertaken with the generous support of ACODE.

Application of the eMM to Australian institutions

Methodology

The design of the eMM and associated concepts have been covered extensively elsewhere (Marshall and Mitchell, 2002, 2003, 2004, 2005, 2006, 2007; <http://www.utdc.vuw.ac.nz/research/emm/>) and will not be repeated in this paper. This section focuses on the assessment procedure that was followed for this pilot project. Institutional members of ACODE were invited to participate in the project at no cost by email and at ACODE meetings. A number expressed interest however only two Australian institutions were able to provide information for assessment within the timeframe for the project.

An important element of the project was the exploration of the extent to which the scale of operation of Australian institutions influenced the outcomes of assessment. Unlike New Zealand universities, and the

majority of other international institutions assessed, the Australian universities were large institutions with operations dispersed over multiple campuses. The expectation was that this dispersal, combined with the size, would mean that a single institutional assessment would lose important information. As a form of control, a single New Zealand institution was also assessed at the same time providing a reference point to assessments undertaken previously (Marshall 2005; 2006a). This provided an updated set of data to use for moderating assessments and a means of ensuring that any capability differences identified were due to actual differences and not any drift in the assessment process.

Each institution contact was given the opportunity to define the number of subsidiary assessments of parts of the organization (referred to as 'slices') that would be needed to cover the diversity of their operations. This decision was made after considering the structure and context of the institution and the likely access to suitable evidence from each slice. In this case, the slices were made by faculty grouping, although that is not a requirement of the eMM. Each slice was assessed using the eMM framework with a number of specific units or courses providing the evidence base (Table 1). The courses were not selected as exemplars of best practice, but rather as examples of normal practice within the institution. The eMM assessment is not of the quality of these particular courses, but rather the capability of the institution as a whole. The course information was complemented with detailed information provided by the institution covering operational activities, strategic planning and policies of the university.

Table 1: Summary of institutional slices and course numbers

Institution	Slice	Courses
University AUS-A	A	2
	B	6
	C	2
University AUS-B	A	2
	B	2
	C	2
	D	1
University NZ-D	A	3
	B	3
	C	1
	D	1
	E	2
	F	3

Individual assessments were made by the project team against the eMM process and practice set (Marshall, 2006b). Evidence of activities that address each of the eMM practices was sought. Any gaps in the evidence were verified with the institutional contact to ensure they reflected gaps in capability not evidence gathering. The resulting assessments were then moderated by direct comparison with those of the other slices and institutions. A summary of the institutional activities assessed by the eMM was provided to the institutional contact person to identify gaps and errors of fact. An assessment of capability was then provided reflecting that understanding of the institution. Institutional contacts were not able to modify the capability assessments but were given the opportunity to review the assessments and ensure that these were fair and reasonable, and that the priorities and recommendations were useful and appropriate to the institution. This process means that a major determinant of the assessment's accuracy is the institutional contact's awareness of what evidence exists across the institution and their commitment to seeking out and providing this evidence.

Institutions were then provided with confidential detailed reports assessing their capability and an overall anonymous report produced for ACODE on the outcomes of the project (Marshall *et al.*, 2009).

ACODE institution capability assessments

Figure 1 below provides a high level visualisation of the capability assessments conducted in the thirteen slices of the three institutions, as well as a consensus capability assessment for each institution. The first observation that can be made is that the eMM's focus on institutional aspects, rather than the detail of content and pedagogy used within individual courses, is readily evident in the consistent assessments made for each slice within the institutions. Exceptions, such as slice C of University NZ-D and slice C of University AUS-B, arose as a consequence of the work of individual staff members. These were

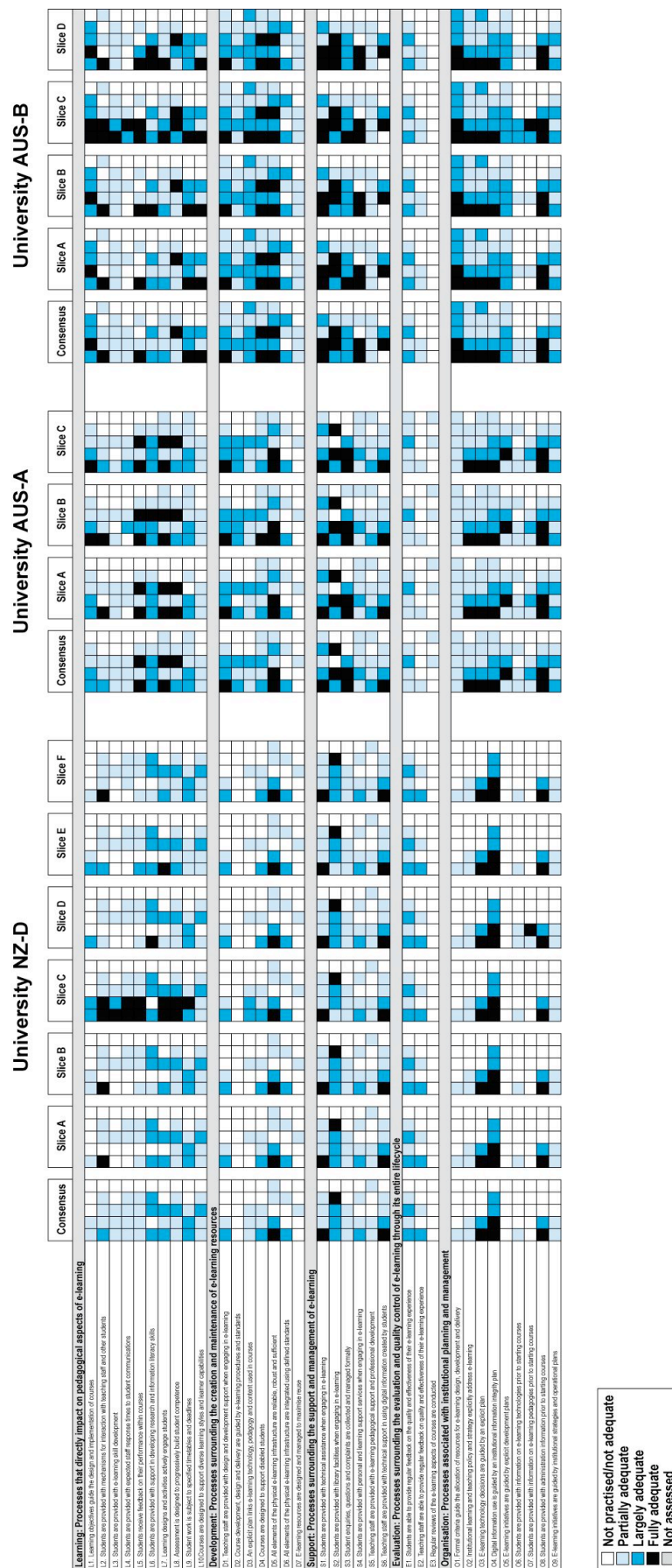


Figure 1: ACODE institutional assessments by slice

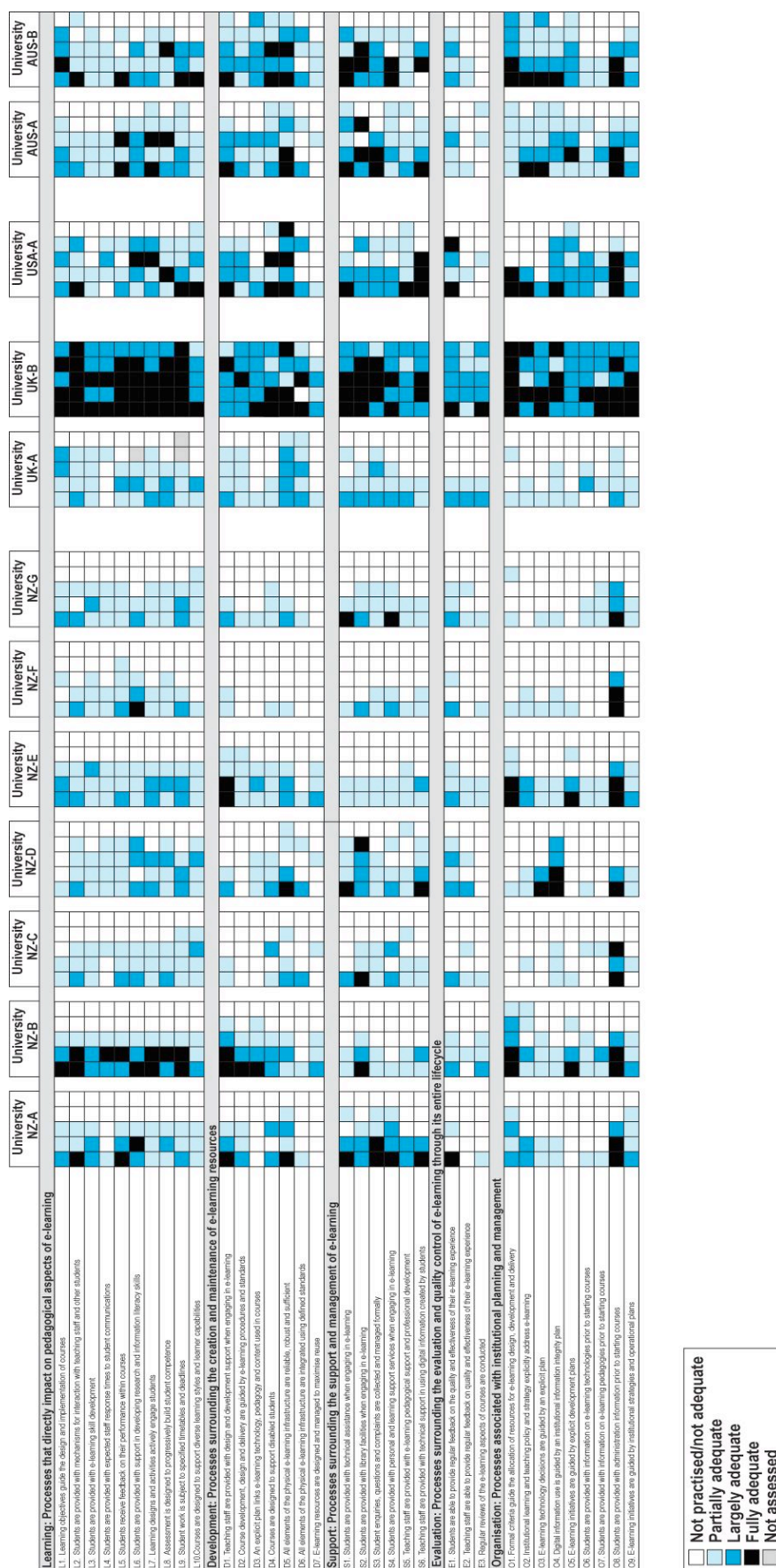


Figure 2: eMM assessments of international universities

recognised by the institutions as reflecting the specific contexts of those courses and did not reflect the general experience of students and staff at the institution. The majority of the difference in these cases was limited to the *Delivery* and *Planning* dimensions of the *Learning* process area, consistent with the aspects under the direct control of individual staff.

The lack of significant additional information provided by the slices suggests that the eMM is focusing correctly on institutional aspects and that the presumption that different disciplines are materially distinct in their e-learning capabilities is incorrect in these institutions. This strongly suggests that substantial cost savings can be achieved in the assessment of large institutions by reducing the number of individual course assessments undertaken. It remains to be seen whether slices based on other aspects of institutional activities, such as geography and mode of delivery, would also produce substantially consistent assessments.

Figure 2 (above) shows the ACODE eMM assessments in an international context, with assessments from the United Kingdom, the United States of America, and others from New Zealand. The two Australian institutions are clearly strong in comparison with the other institutions, particularly those from New Zealand. This, despite the fact that the two Australian institutions were not specialist distance institutions, nor particularly wealthy. In comparison the US institution and University UK-B are both very large distance-learning institutions.

Despite this strength, weaknesses previously identified as common across sectors remain. The *Evaluation* processes are notably weaker than the other process areas for both institutions. This is consistent with the generally observed lack of detailed feedback and review of the e-learning experiences of students and (particularly) staff. Formalised reuse (process D7) also remains largely absent, consistent with previous assessments, and contrary to the high expectations apparent in the literature regarding learning objects (Boyle, 2003). The *Optimisation* and *Management* dimensions are also significantly weaker than the other dimensions across the capability assessments. While this is consistent with the other assessments, it is notable that there are fewer completely white boxes in these dimensions for the Australian institutions, suggesting that activities are being undertaken to address these aspects of institutional capability.

Detailed descriptions of the individual process and dimension assessments are provided in the full report to ACODE (Marshall *et al.*, 2009) however the general results illustrate the overall findings that the eMM is well suited to Australian higher education and copes well with scale and dispersed nature of many Australian universities.

Comparison of the eMM with the ACODE benchmark set

Biggs (2001) identifies the key components of quality assurance frameworks as being the *quality model*, or espoused theory underlying any decisions, the *quality enhancement* mechanism that enables improvement, and the *quality feasibility* mechanism that removes impediments that prevent improvement. The eMM's quality model is that of process maturity development. The ACODE benchmarks (Table 2; ACODE, 2008) follow a different model, the more traditional shared benchmarking approach of Camp (1989) developed to support improvement in the Xerox corporation and used extensively to monitor and improve business activities.

Table 2: ACODE Benchmark Areas (ACODE, 2008)

1: Institution policy and governance for technology supported learning and teaching
2: Planning for, and quality improvement of the integration of technologies for learning and teaching
3: Information technology infrastructure to support learning and teaching
4: Pedagogical application of information and communication technology
5: Professional/staff development for the effective use of technologies for learning and teaching
6: Staff support for the use of technologies for learning and teaching
7: Student training for the effective use of technologies for learning
8: Student support for the use of technologies for learning

A key difference in these quality models is that the ACODE benchmark approach starts with the expectation that institutions know, in at least general terms, which aspects of their e-learning activities need attention. The feasibility mechanisms are thus guided by this presumption and supported by the collaborative activities undertaken. The eMM, in contrast, works to highlight areas of strength and

weakness that may not be realised by the institution, thus supporting feasibility activities addressing previously known and also unknown barriers.

Both frameworks share one key aspect of their quality enhancement mechanism, however, which is the predefined set of items that guide improvement. In the traditional benchmarking model developed by Camp, the starting point is the identification of leading organizations engaging in a given activity. The first stage for benchmarking is then the identification of what that organization does to be successful, so others can replicate it. The eMM and the ACODE benchmarks both provide a predetermined set of activities drawn from a variety of sources (Bridgland and Goodacre, 2005; Marshall, 2006b; Marshall, 2008). While this is more efficient, it does raise the possibility that key items might be missed or that different objectives may limit the range of aspects covered by the models.

A comparison of the item coverage of the two frameworks thus provides a useful mechanism for highlighting the different objectives, either implicit or explicit, that guide the types of improvement supported by the models. Such a comparison was undertaken on an item by item basis, looking at each item in the ACODE benchmark set, and determining whether the eMM addresses it as well. Table 3 and Figure 3, below, summarise the results of that analysis (a detailed item by item report is provided in Marshall, 2009).

In Figure 3, a white box indicates an area addressed by the eMM that is not covered by the ACODE benchmarks, a pink box (lighter grey) indicates partial coverage, while a red box (darker grey) indicates that the eMM addresses explicitly a particular measure or measures with the given dimension of the listed process. This shows that the ACODE benchmarks focus predominately on *Support*, *Evaluation* and *Organisation* aspects (in eMM terms) with a strong emphasis on measurement and quality control (apparent in the mapping with the eMM *Management* and *Optimisation* dimensions. In contrast, the *Learning* process area aspects of the eMM are not addressed by the ACODE benchmarks. This is also apparent in Table 3 where the number of items that map from the ACODE benchmarks to the eMM is significantly higher in *Support* process area than the *Learning* process area.

Conclusions

Given the involvement of Australian experts and practitioners in the definition of the eMM processes and practices it is perhaps not surprising to find that the eMM provides useful information to Australian institutions. Nevertheless, the pilot has provided the opportunity to test the eMM methodology and the results suggest that the assumption that large, multi-campus institutions may possess an internally variable capability may in fact not be true. A weakness of many e-learning improvement models is the lack of validation (Inglis, 2008) and this pilot is the first step in an Australian validation of the eMM. The presence of other measures such as the Course Experience Questionnaire, suggests that a large scale eMM assessment project in Australia may be able to compare its results with those of other quality assurance bodies and consequently further validate the utility and accuracy of the assessments and eMM model.

In addition, the mapping to the ACODE benchmarks has illustrated the need to be clear about the consequences of choosing particular quality models when examining e-learning. The mapping used in this paper can visualise information from either model (Beames *et al.* 2009) or guide institutions deciding what type of issues they wish to address in their e-learning quality enhancement activities and, consequently, which model best suits their needs. The eMM and the ACODE benchmarks, possessing different quality models, quality enhancement mechanisms, and quality feasibility mechanisms, as well as the different emphasis in their coverage should be seen as complementary, rather than competitive.

Finally, in looking at Australian institutions in an international context, as well as internally, and by looking at two different models of quality improvement, this paper has emphasised that whether we occupy the same place or different spaces we are still united by the common objective of improving the experience of our students, and that we still have much to learn about what constitutes high quality e-learning.

ACODE 1				
	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				

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

Figure 3: Summary of mapping between the eMM and the ACODE benchmarks (Marshall, 2009)

Table 2: eMM process mapping to the ACODE benchmark items (Marshall, 2009)

Learning: Processes that directly impact on pedagogical aspects of e-learning		ACODE Item
L1.	Learning objectives guide the design and implementation of courses.	4.11
L2.	Students are provided with mechanisms for interaction with teaching staff and other students.	
L3.	Students are provided with e-learning skill development.	7.3, 7.4, 7.6ab, 7.9, 8.8
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.	4.7ab, 5.4, 6.2abc, 6.3abc, 6.5ac
D2.	Course development, design and delivery are guided by e-learning procedures and standards.	4.2
D3.	An explicit plan links e-learning technology, pedagogy and content used in courses.	4.2
D4.	Courses are designed to support disabled students.	
D5.	All elements of the physical e-learning infrastructure are reliable, robust and sufficient.	3.1, 3.2, 3.4a, 3.7, 3.9, 4.8ab, 8.9
D6.	All elements of the physical e-learning infrastructure are integrated using defined standards.	3.1, 3.2, 3.9
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.	7.1, 7.3, 7.4, 7.6a, 7.9, 8.3, 8.4ac, 8.5abc, 8.7, 8.8, 8.9
S2.	Students are provided with library facilities when engaging in e-learning.	7.3, 7.9, 8.3, 8.4ac, 8.5abc, 8.7, 8.8
S3.	Student enquiries, questions and complaints are collected and managed formally.	7.3, 7.9, 8.8
S4.	Students are provided with personal and learning support services when engaging in e-learning.	7.3, 7.9, 8.8
S5.	Teaching staff are provided with e-learning pedagogical support and professional development.	3.5a, 4.2, 4.7ab, 5.4, 6.2abc, 6.3abc, 6.5ac, 6.8
S6.	Teaching staff are provided with technical support in using digital information created by students.	4.7ab, 5.4, 6.2abc, 6.3abc, 6.5ac
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.	2.6, 4.11, 4.12, 7.3, 8.8
E2.	Teaching staff are able to provide regular feedback on quality and effectiveness of their e-learning experience.	2.6, 4.11, 4.12
E3.	Regular reviews of the e-learning aspects of courses are conducted.	2.6, 4.11, 4.12, 7.3
Organisation: Processes associated with institutional planning and management		
O1.	Formal criteria guide the allocation of resources for e-learning design, development and delivery.	2.2ab
O2.	Institutional learning and teaching policy and strategy explicitly address e-learning.	1.1, 1.4, 1.5, 4.1, 5.1ac
O3.	E-learning technology decisions are guided by an explicit plan.	1.2a, 1.8, 2.2a, 3.7, 3.9
O4.	Digital information use is guided by an institutional information integrity plan.	
O5.	E-learning initiatives are guided by explicit development plans.	1.2a, 2.2b, 4.2
O6.	Students are provided with information on e-learning technologies prior to starting courses.	7.3
O7.	Students are provided with information on e-learning pedagogies prior to starting courses.	7.3
O8.	Students are provided with administration information prior to starting courses.	
O9.	E-learning initiatives are guided by institutional strategies and operational plans.	1.1, 1.2b, 1.6, 2.2ab, 4.1, 4.2, 5.1ac

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