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Overview

The project is committed to understanding, recognising and developing various forms of institutionally relevant distributed leadership in developing and trialling various components of a quality management framework for online learning environments in Australian higher education. This paper provides an overview of issues related to the management and improvement of quality, including in the context of higher education. In response to the complex and multi-dimensional nature of both quality and online learning environments (OLEs), the concept of a framework for organising policies, procedures and actions relating to the good governance of OLEs can be found in the literature. Such frameworks vary in scope, format and title, and a (non-exhaustive) sample is presented in summary here. Key learnings that can be drawn from the exemplars frameworks and the related literature include:
• the processes for the design of such frameworks;
• the components of such frameworks;
• the measurement mechanisms and metrics employed in such frameworks; and
• the validation of such frameworks.

What is ‘quality’?

What is quality in a car?
• Reliability?
• Precision finish?
• Good handling?
• Expensive price?
• Strong components?

What is quality in a jacket?
• Designer label?
• Tailored fit?
• Lasts for years?
• Dry-cleans like new?
• Comfortable to wear?

What is quality in a restaurant meal?
• Friendly, prompt table service?
• Wide selection on menu?
• Silver knives and forks?
• Food warm when served?
• Meal cooked as you ordered?

Look up quality in the dictionary and you will find a range of meanings. Quality is the term we use to describe and assess an array of characteristics of a diverse range of physical goods and intangible services. According to Garvin (1988) there are five common definitions of, or approaches to quality:

1. Transcendent – quality can’t be precisely defined, but we know it when we see it, or are aware of its absence when it is missing. This is not a particularly useful approach to quality if we hope to make an objective assessment of quality.

2. Product(or attribute)-based – differences in quality relate to differences in the quantity of some attribute – for example, the quality of a piece of jewellery may relate to the proportion of gold it contains, 18 carat gold being better than 9 carat gold.

3. Manufacturing(or process)-based – quality is measured by the degree to which a product or service conforms to its intended design or specification; quality arises from the process(es) used.

4. Value-based – quality is defined by price – a quality product or service is one that provides desired performance at an acceptable cost.

5. User(or customer-)-based – quality is the capacity to satisfy needs, wants and desires of the user(s). A product or service that doesn’t fulfil user needs is unlikely to find any users (Garvin, 1988). This is a context-dependent, contingent approach to quality.

In the context of tangible goods, it has been suggested that we assess quality in terms of the following eight factors/dimensions:

1. performance;
2. features;
3. reliability;
4. conformance;
5. durability;
6. serviceability; and
7. aesthetics; and
8. perceived quality (Garvin, 1991).

In the context of intangible services, some authors have attempted to apply Garvin’s eight dimensions of product quality to service quality, but the analogy becomes tenuous in places. Others have attempted to identify how we assess the quality of services, including:
1. time;
2. timeliness;
3. completeness;
4. courtesy;
5. consistency;
6. accessibility and convenience;
7. accuracy; and
8. responsiveness (Evans & Lindsay, 2005).

Other authors have suggested alternative and/or additional dimensions of quality. The list that we might select as applicable in a particular context is dependent on the product and/or service in question and the purpose for which we wish to assess quality.

The contemporary view of quality places the user (often the ‘customer’) in a central role (Crosby, 1995). We need to understand the needs of the user if we are to successfully deliver services and/or products that will fulfil their needs. The ultimate measure of quality resides in the perceptions of the ‘customer’. This is a much more sophisticated view of quality than appealing to elegant designs or devising reliable systems for production and/or delivery, however it forces the supplier to confront questions that are often difficult. Who is/are the customer(s)? What are their needs, wants and desires? These are difficult enough questions of themselves, but are further complicated by the fact that the user group is generally not homogeneous, and may have a wide range of potentially conflicting requirements. And over time, these needs may change. Think of personal computers – what would have been seen as desirable processing speed, size, etc. five years ago would today been viewed as inadequate.

Another important idea from the contemporary conceptualisation of product quality is that all areas of an organisation contribute to the final quality of the services and products produced (Juran, 1988). Poor market research may lead us to offer products/services that no one wants, regardless of how well we deliver them. A flawed design cannot be turned into quality regardless of how repeatable our delivery processes. An excellent design will appear highly variable in quality if our process tolerances are too wide, or our raw materials are of a low standard. A high quality product can be ruined during transport to the customer. There is a system-wide ‘quality function’ that exists and impacts on quality. In a manufacturing context, it is recognised that up to 85 percent of quality issues are the result of systemic factors beyond the control of individual workers (Deming, 2000) – the general concept that arises here is that quality is primarily a management responsibility, and the operation of the entire organisation needs to be considered when seeking to improve quality. In a university context, this implies that the student perception of quality is likely to be influenced just as much by the timetable clashes, late delivery of materials, the amount of network downtime, the temperature of the classroom and the size of the tutorial class, as it is to be influenced by currency
of course material.

**Quality control, quality assurance and quality improvement**

The quality arena is full of jargon, but there are some basic terms/ideas that are important.

Quality: an assessment of the degree to which service or product meets the expectations of a user based on an identified set of attributes. The relative importance of particular attributes depends on the individual user and their context.

Quality Control (QC): a process based on measuring identified quality attributes to ensure that the product or service delivered to users is of a defined/agreed quality standard. For products, QC is normally applied following production, and defective items have to be scrapped or re-worked. QC often incorporates statistical sampling from batches, such that only a comparatively small proportion of all items need be tested to ensure a low level of defective items reach the user.

Quality Assurance (QA): a set of procedures (system) designed to ensure that a product or service meets a specified minimum level of quality. While a QA system would normally incorporate some form of QC, rather than relying on ‘inspecting in’ quality using QC, QA systems typically seek to implement delivery systems that do not produce defective items. A QA system would use QC data to identify quality problems and rectify them to maintain the required level of quality.

Quality Improvement (QI): encompasses a wide range of techniques for attaining improved levels of quality. Changes in user/customer demands and/or developments in competing products/services mean that there is likely to be a need to improve quality over time. The most appropriate QI techniques depend on the service or product in question, the organisational context and the nature of the improvement sought.


These terms are sometimes confused, for example, QC and QA are not same as quality. What represents quality in a particular service or product is generally an individual assessment; QC/QA are simply methods for ensuring that a specified level of quality (low or high) is achieved.

There are a number of standard QMSs, the most widely used of which is the International Organization for Standardization standard ISO 9001:2000 Quality management systems – Requirements. Many national standards bodies (including Standards Australia) have adopted ISO 9001 as their equivalent national standard. ISO 9001 specifies the requirements for a QMS under five main categories:
1. quality management system – what it must contain and how it must be documented;
2. management responsibility –confirming that quality is a management issue;
3. resource management – to achieve quality we must have appropriately trained people, appropriate processes, equipment capable of producing quality, and raw materials of an appropriate level of quality;
4. product realisation – how all the steps from design through to manufacturing and/or service delivery contribute to quality; and
5. measurement, analysis and improvement – how quality will be measured, how products/services that do not meet quality standards will be rectified, and what quality improvement processes will be used.
The question is often asked, “How can a single standard specify the requirements of a quality system for all types of organisations?” The answer is that ISO 9001 is not concerned with the details of what is done by an organisation, but only how it is managed. It identifies those generic processes in an organisation that must be controlled to achieve quality, without prescribing the details of the controls. The details of the quality system actually implemented need to be determined by each organisation, taking into account the expectations of their users, their range of products and/or services, their processes, their quality goals, and their own unique circumstances. The use of terms such as ‘product’ and ‘customer’ reveal the development of approaches to quality that are rooted in the manufacturing of physical goods, however there is an extensive literature on the application of these same quality principles to the development and delivery of services. ISO 9001 employs the term ‘product’ to mean both service and product.

A QMS can be viewed as an unwanted administrative burden. However, the basic requirements for even an ISO 9001 QMS do not have to be onerous. It requires an organisation to articulate a quality philosophy that defines quality and identifies what aspects of the operation will be covered by the QMS, formalise existing operating procedures, implement a small number of mandatory procedures, provide any necessary staff training and keep records to demonstrate the operation of the QMS. Of course, like other management functions, such as planning and budgeting, quality management can appear to take on a life of its own, creating busywork for its own sake, but this is not an inevitable by-product of having a QMS. A QMS system can be viewed as a barrier to innovation that will lead to homogeneity, the lowest common denominator and stagnation. However there are a range of well known innovative organisations (including Apple, 3M and Hewlett-Packard) that have ISO 9001 QMSs in operation. An organisation with a QMS that is suffering from an inability to innovate would do better to look for policies that penalise, neglect or do not provide the resources required to innovate. A QMS itself is no barrier to innovation.

An idea arising from the existence of QMSs is ‘certification’. If we have a QMS and believe that it is functioning well, we can declare this fact – this is referred to as first-party certification. If we have an important customer, they may wish to audit our QMS – a successful audit of this type is referred to as second-party certification. If we wish to demonstrate to a wider audience that we have an effective QMS, we may seek an appropriately qualified/accredited independent organisation to conduct the audit of our QMS – this is referred to as third-party certification.

**Quality and higher education**

To many, the idea of applying quality concepts (particularly some of the terminology rooted in the manufacture of commercial products) to education is anathema (Anderson, 2006). For some, in the context of education, it does not seem possible to move beyond transcendent conceptions of quality. However, defining quality in education by using other equally ill-defined terms (such as ‘excellence’) doesn’t advance the issue in any practical way. The contemporary, user-centred, perceived experience view of quality is not conceptually incompatible with many modern ideas in education (Lewis & Smith, 1994), including student-centred learning, inclusiveness and learner experience design. But, like all matters of educational policy and practice, the devil is in the detail, and no less so than in defining/agreeing what we mean by ‘quality’ in higher education, and then devising objective measures for it. As previously noted, quality is a system-wide function, and a comprehensive model of quality in higher education should encompass both teaching (organisation-related aspects) and learning (student-related aspects), and include input, process and output factors for both areas (Oliver, 2003).
Many critics of quality in education appear to confuse ‘quality’ with QA/QC processes. However, these processes don’t define or necessarily even improve quality; they only seek to ensure that a previously specified level of quality (however that is defined) is actually achieved. An inability to articulate and/or agree what constitutes quality in education does not, of itself, constitute a limitation of QA/QC processes as applied to education. This is not to say that the move from a transcendent to a more concrete definition of quality in education, or that reconciling the needs of the large education stakeholder group is necessarily straightforward or without conflict.

The starting point for quality is the user, or to use the unfortunately more ‘charged’ quality terminology – the ‘customer’. It is worth noting that the ISO 9001 QMS standard simply defines ‘customer’ as any person or organisation that receives a product or service; there is no inherent implication of a purchase being involved. Then, who are the ‘customers’ in higher education? Who receives the outputs/benefits of the higher education system? The Standards Australia handbook HB 90.7-2000 Education and Training Guide to ISO 9001:2000 suggests that it can be any or all of the following as appropriate to the particular context:

- a student;
- a student’s parents or employer;
- a company or organization with whom a research contract, a consultancy agreement or a training contract is entered into;
- an industry;
- an internal customer (i.e. within the education and training provider’s own organisation);
- a government, regulatory body, accreditation body and similar; and
- a relevant society group, such as a parents and citizens group, members of staff, and society as a whole (Standards Australia International, 2000).

Such a diverse stakeholder/user group indicates the complexity of the task of identifying the range of needs that we might include in a definition of quality in higher education. We also need to consider what service/product we are providing to the user(s). HB 90.7-2000 includes the following suggestions:

- an educational environment,
- a curriculum and other resources,
- a community service, or
- research outputs,

for the enhancement of skills/knowledge/understanding/attitude/values (Standards Australia International, 2000).

Defining who the user is and what we are offering to them provides a framework for identifying what aspects of quality we would seek to control and/or improve and which areas of the organisation contribute to/impact on that quality as perceived by the user. In any conception of quality in higher education, students must be viewed as a principal user group. Some may argue that many undergraduate students are comparatively naive ‘customers’ with a limited conception of the knowledge and skills necessary in their field of study. However, ignoring the needs and expectations of any important customer group is a recipe for organisational failure, and the modern university undergraduate student is just as likely to turn out to be a mature age student (with significant experience of their field of study and/or prior experience in higher education) rather than an 18 year old directly from secondary school. Over the course of their studies, students will experience a wide range of teaching and learning, and be well placed to make comparative judgements of quality, and, as novices in their discipline, will also be qualified to judge whether their involvement in education is assisting them to learn (Ramsden, 1991).
A range of universities have adopted ISO 9001 as the basis for their QMS, with many being certified by external accrediting bodies. In Australia, it is common to see separate academic and administrative units and/or commercial subsidiaries with a certified QMS, rather than entire universities (Baird, 2006). At the time of writing, these include various Faculties of Central Queensland University, the School of Chemical Engineering of the University of Adelaide, the School of Electrical, Electronic and Computer Engineering at the University of Western Australia, a range of university commercial entities (including Deakin Prime) and many university support divisions (including several divisions of Deakin University). ISO 9001 has been used as an example/framework for a QMS in the sections above, but this is not meant to imply that it is the only or best approach – in a higher education context, the literature contains a range of approaches to implementing a QMS.

In Australia, the Australian Universities Quality Agency (AUQA) plays an important role in quality in higher education. AUQA is a national body that audits and reports on QA in Australian higher education. Audits are conducted on a five-yearly cycle, and require institutions to prepare a self-report around a series of structured criteria, which is then followed up by an on-site audit of the institution. Audits are primarily norm-referenced, taking into consideration the individual aims of the institution, as well as commonly accepted practice in the sector. AUQA principal function is in the assurance of quality, though it does incorporate elements of quality improvement/enhancement through:

- the inclusion of recommendations for improvement in its audit reports;
- the hosting of a ‘good practice database’ to disseminate good practice; and
- hosting the Australian Universities Quality Forum to facilitate sharing of good practice in higher education in Australia.

AUQA’s audit process evaluates the institution’s QA processes on four dimensions: approach, deployment, results and improvement (ADRI) (Australian Universities Quality Agency, 2007). While not performing a third-party QA certification role per se, AUQA’s audit reports (including ‘Commendations, Affirmations and Recommendations’) are publicly available. At some point in the near future, the functions of AUQA will be taken over by a new body the Tertiary Education Quality and Standards Agency (TEQSA), which is intended to be in place for the second half of 2011.

In higher education, just as in industry, QA processes can be seen as resource sapping busy work or an administrative tool to micro-manage the affairs of staff (Marginson & Considine, 2000), but this has more to do with the implementation of the QA system, rather than any inherent feature of QA. These perceptions are perhaps amplified in higher education due to the wide range of ‘customers’, the intangible nature of the ‘product’ and the bureaucratic nature of higher education institutions and accounting for the use of public funds.

Quality improvement in higher education

As noted above, the primary role of a QMS in general, and AUQA in higher education, is the assurance of quality. But, for both its own sake and in response to a competitive environment, we should also be concerned with the improvement of quality. The higher education literature notes that QA and QI (or quality enhancement) are not the same thing (Avdjieva & Wilson, 2002; Knight, 2006). A short-term ‘tactical’ response to quality in higher education may be adequate to satisfy external QA auditing bodies, but a ‘strategic’ approach to quality is needed for the development of an organisation-wide culture of QA and QI (Gordon, 2002).
While there is no specific international standard to provide a framework for QI that is analogous to that provided by ISO 9001 for QA/QMS, there is no shortage of available QI techniques. In the context of quality in higher education, many authors suggest (perhaps appropriately for universities) the model of the ‘learning organisation’ as a way to move from a culture of compliance to improvement (Avdjieva & Wilson, 2002; Hodgkinson & Brown, 2003; Yorke, 2000). A learning organisation is one that achieves both individual and collective learning through open and honest reflective practices based on objective information. In a paper that acknowledges the multidimensional nature of quality and that the emphasis in higher education quality is moving from compliance to development, (participatory) action research is presented as a quality improvement approach that embodies the learning organisation philosophy (Kekäle & Pirttila, 2006) in a methodology that would not be unfamiliar to many academic staff. The similarity between the cyclical nature of the action research model and the cyclical nature of the plan-do-check-act cycle that is the core of many QI methodologies has been noted elsewhere (Tolbert, McLean & Myers, 2002). While the application of action research in higher education can be interpreted in a range of ways (Kember & Kelly, 1993), generally, action research seeks to improve/transform practice through the considered application of actions, objective evaluation of the outcomes and the continued refinement of our understanding of the factors at play in a given situation. It incorporates the concept of well informed action, and when applied to improving the quality of teaching and learning, challenges us to define ‘quality’, and to develop methods to measure this quality.

One survey of academic staff actively publishing in the literature related to quality in higher education from a range of disciplines and countries found that the most favoured definition of quality related to satisfying customers’ needs, students were considered the most important customer group (followed by employers) and nearly all agreed that some form of quality measurement was important (Owlia & Aspinwall, 1996). The many stakeholders in higher education lead to a multitude of measurements (or performance indicators) for various purposes, including factors such as retention rates, research outputs, completion rates, student evaluations, staff-student ratios, and graduate employment data.

If students are key users of higher education, what are the factors in their learning that they consider important? In Australia, a large analysis of open-ended comments made by university graduates on their studies as part of the course experience questionnaire (CEQ) was undertaken (Scott, 2006). While confirming the complex and multi-faceted nature of quality that arise from such a diverse group of users, and that it is the total university experience that counts, a key finding from the investigation was that students highly value learning methods that engage them. Student engagement has long been identified as a key qualitative measure of quality of student learning (along with assessed student results as a quantitative measure) (Trigwell & Prosser, 1991). There also exists a literature that confirms a link between student evaluation of their ‘quality of teaching’ (perhaps better expressed as ‘experience of teaching’ to avoid apparently circular, but common definitions of quality based on quality) and their approach to and engagement with their learning (Ramsden & Entwistle, 1981). This is one of the reasons why student evaluation of teaching is used as an important measure of quality in higher education.

Quality in higher education will remain a contested domain. Modern developments in the field of quality bring a semantic legacy that reveals their history in the production of tangible products (typically for commerce), and that automatically makes many of the associated concepts unpalatable to some in higher education. In addition to this, the wide range of stakeholders in higher education leads naturally to a multiplicity of (often competing) interpretations of quality.
Regardless of this, and even if only at a very pragmatic level, student learning outcomes must be a key measure of quality in higher education. Research indicates that student learning is related to their perceptions of their teaching and learning environment. This is why student evaluation of their teaching and learning environment is one key measure that can be used as part of a continuous, action research-based approach to quality improvement in higher education.

**Online Learning Environments**

Learning management systems (LMS) are perhaps currently the most widely used and most expensive educational technology tool (Salinas, 2008), and, like many other learning technology trends before them, have been adopted by higher education institutions almost automatically and uncritically (Reynolds, Treharne & Tripp, 2003). The choice of a particular system is a significant decision making event shaping institutional approaches to information and communication technology (ICT-) enabled learning for a considerable period of time, i.e. for most institutions at least five years. Many university leaders have a stake in making and implementing such a choice, ranging across University Senior Executive members, leadership of central teaching, learning, media production and IT groups and through various levels of faculty academic leadership. The latter encompassing such leaders as Associate Deans, Teaching and Learning, Heads of School and program and unit/course coordinators. Almost all staff in a university use and rely on LMSs in enabling student learning. Having committed to a particular system, how do all of these leaders work together to maximise value, what types of data are collected at what levels of the organisation to assure and improve the quality of use, and how is evidence acted upon through the various decision making structures of the institution? These questions illuminate the need to conceptualise and draw together the elements of a whole-of-institution approach to leading the quality management of OLEs, with their major focus on LMSs, and increasing need to take account of social networking environments.

Relevant to the project is the importance of quality management systems, and their current state of underdevelopment in higher education, as highlighted by Fullan and Scott (2009). Turnaround leadership, they argue, is dependent on the development of such systems, and a greater focus on outcomes and impact (as opposed to inputs). They also observe:

...a focus on robust evidence is often not front and center when it comes to making decisions about what most requires improvement and attention in universities, what their key strategic directions should be, or how well their core activities are currently working in practice. ...A university culture characterised by a commitment to continuous evaluation, inquiry, and quality improvement concentrates on using evidence to identify what aspects of its current provision are working well and what most need enhancement (Fullan & Scott, 2009, p. 80).

We argue that effective leadership of OLEs is also dependent on such systems with the associated focus on learning and teaching outcomes and impacts, and such systems are nowhere more important than in areas of greatest strategic importance and value to the institution – corporately supported LMS and associated e-learning technology investments. We concur with Fullan and Scott (2009) that much greater commitment to systematic institutional evidence gathering and use is required in the area of OLE implementations. To many, the idea of applying quality concepts to aspects of education is anathema (Anderson, 2006), however to move beyond transcendent conceptions of quality requires the specification of some process and/or output characteristics that can be measured.

It has been observed that it is now feasible to track the multiple means by which students engage with university systems throughout the entire student life cycle – from initial admission to
graduation and beyond. And that the combined data captured by various systems builds a detailed picture of the activities of the entire institution that can be used to improve the quality of higher education (Dawson, Heathcote & Poole, 2010). The near universal use of LMSs in higher education means that they are a key potential source of ‘quality data’ relating to both student learning and more generally to the contribution that the OLE is making to student learning and other desired outcomes. This data may be in the form of the vast quantity of objective data that LMSs gather and store about student engagement with the system and the learning activities facilitated by the system, and/or it may be in the form of surveying of staff and students’ perceptions of the value of various functions of the OLE, and that may incorporate elements beyond the LMS.

Additional forms of data relating to the OLE may be gained from existing student evaluation of teaching (SET) processes. Institutions may run their own internal SET surveys at the unit and/or program level that may include items that specifically address the OLE. At a national level, all Australian universities currently participate in the CEQ, but there is evidence that aspects of the CEQ may not be well suited to 'unconventional' teaching and learning environments (Lyon & Hendry, 2002), the CEQ contains no items that specifically refer to online aspects of the student experience, and a large analysis of open-ended comments in the CEQ made by more than 160,000 graduates from 14 Australian universities found that ICT did not figure highly in student ratings (Scott, 2006). More recently, the Australasian survey of student engagement (AUSSE) has gained some prominence (Coates, 2010). However, the AUSSE instrument contains only a handful of items specifically related to online aspects of student study, and it has a clear lineage from the US National Survey of Student Engagement (NSSE) which is rooted in a classroom-based, full-time, often residential model of education. While there appears to be little published work from Australasia that can make a link between institutional student evaluation of teaching (SET) data and the tangible contribution of OLEs (Bacsich, 2008), such SET data will nevertheless remain of key importance while it is used in the determination of performance funding for higher education institutions. More recently, proposals to use (or adapt and use) the US Collegiate Learning Assessment survey, and the development of a new national University Experience Survey (Lane, 2011) mean that the situation regarding the use of national/institutional SET data is likely to be a moving target for some time.

A UK JISC project to identify the ‘tangible benefits of e-learning’ identified a range of OLE metrics that could be measured/assessed including, but not limited to: effect on learning, effect on exam results, effect on student personal development, student satisfaction with e-learning, innovation in teaching, staff satisfaction with e-learning, and influence on retention (Ferrell et al., 2007). Moreover, based on a large number of case studies from a wide range of disciplines in UK universities, they concluded that the appropriateness of particular metrics depend on the nature of the process or output factor(s) under consideration, as well as the e-learning approaches being employed. They summarise this relationship in Table 1.

Table 1 – Benefits of e-Learning: Drivers, Approaches and Metrics.

<table>
<thead>
<tr>
<th>Nature of problem</th>
<th>Well-defined</th>
<th>-</th>
<th>Complex</th>
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</thead>
<tbody>
<tr>
<td>Evidence</td>
<td>Resource use</td>
<td>Effective pedagogy</td>
<td>Student engagement</td>
</tr>
<tr>
<td>Metric</td>
<td>Cost</td>
<td>Course pass rates</td>
<td>Student feedback</td>
</tr>
<tr>
<td>Driver</td>
<td>Rational</td>
<td>Pedagogic</td>
<td>Professional</td>
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Frameworks
While Table 1 is relatively simple and focuses primarily on ‘measures of benefit’ related to OLEs, it does conveniently introduce the idea of a ‘framework’. The online Cambridge dictionary defines a ‘framework’ as:
- a supporting structure around which something can be built;
- a system of rules, ideas or beliefs that is used to plan or decide something (Cambridge University Press, 2001).

In the context of OLEs, frameworks abound, including those specifically focussing on quality of student online learning. They go by many names: frameworks, models, benchmarks, systems, etc., and several are described in brief below. The list included not exhaustive, and many others exist (Inglis, 2008). The accompanying project occasional paper entitled Distributed Leadership in support of quality management of Online Learning Environments (OLEs) documents a number of frameworks related to organisational leadership, of which some could also be potentially be adapted as frameworks for the quality management of OLEs.

In the context of the management of quality, frameworks arise because, as noted previously, quality is a multi-dimensional construct that resists collapsing into simple, single measures in all but the most trivial conceptions of quality. Inglis (2008) notes:

… the delivery of courses is a multi-faceted activity and that the process of measuring quality in education relies on unpacking the range of factors that impact the learner’s experience and measuring these separately. To bring together the various elements that contribute to the quality of a course, most quality processes rely on the use of a quality framework of one type or other. (Inglis, 2008, p. 348)

Typically, a quality framework will define the characteristics/variables of importance for a domain of interest, and identify the dimensions/values that those characteristics might take from a range of categorical states or ordinal values on a continuum. Such an approach means that it is possible to be judged as high-performing/high quality in some aspect of the framework while simultaneously being judged as low-performing on others.

The Charles Sturt University Educational Technology Framework described below provides one institution’s rationale for, and intended uses of, an OLE framework, including:
- guiding the governance, policy and practice needs for educational technology;
- providing a structure through which planning and goal-setting will occur to guide future development;
- interpreting and informing the University Strategy and University Plans to ensure the development, provision and use of educational technology advances learning and teaching;
- providing a coordinated means to identify and respond to current and emerging requirements for educational technology;
- ensuring that learning and teaching innovation and development will encompass both innovation in pedagogical approaches to the use of educational technologies and the educational technologies themselves;
- providing guidelines for the introduction and use of educational technologies, to ensure high quality learning and teaching practices and learning resources;
- leading to coordinated deployment of educational technology and productive work-processes; and
- engendering creative interest and enthusiasm in the use of educational technologies.
The Charles Sturt University Educational Technology Framework (in Appendix B) also provides one methodology for the development of an OLE framework:
1. Review documents of other universities and the CSU Faculty of Education strategy/plan
2. Interview ACODE colleagues who have developed similar plans/frameworks/strategies
3. Investigate principles guiding current practice through the baseline surveys
4. Work with ACODE colleagues to develop generic aspects and learning from each other
5. Link with CSU Strategy and University plans, especially the Student Experience theme
6. The Working Group develop drafts in consultation and collaboration with stakeholders, especially the OLE Reference Group
7. Review educational technology use by staff and students as
   - A baseline institutional audit and what staff and students would want to use in the next 5 years
   - Identify and categorise known issues with regard to the areas in the Framework
   - Develop use cases for the Plan.
8. Seek endorsement of the Framework by ILSC, L&T Committee and Academic Senate
9. Seek endorsement of the Plan by ILSC, L&T Committee and Academic Senate.

Inglis (2008) notes an extensive literature on the factors that might be included in a framework for assessing the quality of online courses, but that most published frameworks say little about methods for validating the adequacy of the framework.

There seems to be a taken-for-granted assumption that if the originator of a framework has thought sufficiently about the development and delivery of courses appropriately, then this will suffice to assure its validity. (Inglis, 2008, p. 348)

However, it is not sufficient to presume that the originator(s) of the framework has identified all relevant quality factors, nor that what is important/relevant in one context will automatically translate to, or be sufficient for, another context. Based on a review of published e-learning quality frameworks, Inglis (2008) identifies a number of possible methods for the validation (as fit for purpose) of e-learning quality frameworks, including:
1. reviewing the research literature related to effectiveness in online learning;
2. seeking input from an expert panel;
3. undertaking empirical research;
4. undertaking survey research;
5. conducting pilot projects; and
6. drawing on case studies.

These suggested framework validation methods align well with the proposed project methodology, and provide a measure of confidence for the outcomes of project. The following sub-sections describe a range of documented ICT quality frameworks, including some designed specifically to address quality of e-learning.

Queensland Government ICT Asset Lifecycle
As a collection of one, and typically more, ICT systems, an OLE goes through a lifecycle similar to any other ICT system. One comprehensive model of the ICT lifecycle (Queensland Government Chief Information Office (Enterprise Architecture & Strategy), 2009) is given in Figure 1. Just as any area of an organisation may have an impact on the quality of its products/services, any phase of the ICT lifecycle may have an impact on the quality performance of the OLE, as experienced by its many types of users. As an existing OLE reaches the end of its useful life, a new OLE lifecycle for its replacement may commence and for a period run in parallel as the existing system is decommissioned. A comprehensive quality management model for an OLE would
encompass/consider all stages of the ICT lifecycle. Table 2 provides an overview of the management activities that would typically be conducted in each phase of the lifecycle. The reference document also expands on these identified activities by considering each phase of the lifecycle from three perspectives (information assets, business applications and technologies) and notes that effective management of ICT assets depends on a clear understanding of the ways in which these three elements interact.

![Figure 1 – The ICT Asset Lifecycle.](image)

Table 2 – Phases of the asset lifecycle.

<table>
<thead>
<tr>
<th>Phase</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plan</td>
<td>• Develop requirements including:</td>
</tr>
<tr>
<td></td>
<td>- business requirements</td>
</tr>
<tr>
<td></td>
<td>- technical requirements</td>
</tr>
<tr>
<td></td>
<td>- operational and support requirements</td>
</tr>
<tr>
<td></td>
<td>- security requirements.</td>
</tr>
<tr>
<td></td>
<td>• Identify users and support roles and responsibilities.</td>
</tr>
<tr>
<td></td>
<td>• Identify risks and barriers regarding use of the asset.</td>
</tr>
<tr>
<td></td>
<td>• Develop strategies to mitigate risks including backup and recovery plans.</td>
</tr>
<tr>
<td></td>
<td>• Establish training needs.</td>
</tr>
<tr>
<td></td>
<td>• Establish the context for use of the asset.</td>
</tr>
<tr>
<td></td>
<td>• Specify the design.</td>
</tr>
<tr>
<td></td>
<td>• Source suppliers.</td>
</tr>
<tr>
<td>Construct, Create, Acquire</td>
<td>• Build, create or acquire the asset.</td>
</tr>
<tr>
<td></td>
<td>• Monitor the quality of the implementation or installation.</td>
</tr>
<tr>
<td>Commission, Organise, Store</td>
<td>• Test the asset against the requirements.</td>
</tr>
<tr>
<td></td>
<td>• Prepare the asset for use.</td>
</tr>
<tr>
<td></td>
<td>• Classify the asset and establish meta data and supporting documentation about the asset and its use.</td>
</tr>
<tr>
<td></td>
<td>• Ensure that information about the asset and its location can be easily retrieved by endorsed parties.</td>
</tr>
<tr>
<td>Phase</td>
<td>Description</td>
</tr>
<tr>
<td>-------</td>
<td>-------------</td>
</tr>
</tbody>
</table>
|       | • Ensure information assets are stored in secure organisational repositories.  
|       | • Ensure mobile physical assets are stored in secure facilities. |
| Access | • Ensure authorised users can access the asset.  
|       | • Ensure security requirements are met.  
|       | • Establish protocols so that the asset can be safely shared or re-used. |
| Use   | • Provide support and training to users of the asset.  
|       | • Monitor usage and utilisation of the asset. |
| Assess| • Assess the condition of the asset.  
|       | • Assess the cost of maintaining the asset.  
|       | • Assess opportunities for extending the use of the asset.  
|       | • Assess the current business value of the asset.  
|       | • Assess the current and asset management strategy. |
| Maintain | Based on the assessments, apply appropriate management strategies. These include:  
|       | 1 Optimise – Invest to address or maintain the technical condition maintained while rationalising the operational costs if possible. Maximise the use of the asset with the intent to create a flagship asset.  
|       | 2 Rationalise – Invest to upgrade the asset to improve its technical condition and reduce operational costs. Consider lower cost alternatives.  
|       | 3 Enhance – Ensure sufficient funding to ensure the future technical condition of the asset and promote reuse of the asset to maximise the future value of the asset.  
|       | 4 Replace – Maintain the technical condition of the asset in the short term until the dependencies have been migrated to an alternative more stable solution.  
|       | 5 Research and explore – Assess the function of asset against the requirement and identify alternative uses for the asset and the potential to deliver additional business value. Promote the availability and use of the asset.  
|       | 6 Decommission – Retire the asset. |
| Retire | • The business requirement for using asset has significantly evolved or no longer exists.  
|       | • The asset has reached the end of its useful life and is decommissioned. |

**Oliver/ECU Framework for Quality in Online Teaching and Learning**

In drawing from the general Edith Cowan University framework for describing quality teaching and learning (based on the ‘3P’ model of input, process and output factors relating to learning, and in this case teaching as well), Oliver (2003) asserts that the quality principles that underpin successful online teaching and learning are exactly the same as those that underpin successful classroom teaching and learning. He concludes that no additional special elements are required and that, ultimately, the same judgements of quality need to be employed on all modes of teaching and learning. While noting that all modes of teaching and learning require the elements of the framework are satisfactorily addressed, he suggests that there are naturally some elements that have specific reference to online teaching and learning – these are highlighted in **bold italic** within the overall ECU quality framework given in Table 3.
Table 3 – Oliver/ECU framework for describing quality in online teaching and learning.

<table>
<thead>
<tr>
<th>Inputs</th>
<th>teaching</th>
<th>learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>elements and attributes which describe pre-conditions for successful teaching and learning</td>
<td>course establishment and course review processes</td>
<td>student selection and entry into courses</td>
</tr>
<tr>
<td></td>
<td>curriculum specifications</td>
<td>students’ progression through courses</td>
</tr>
<tr>
<td></td>
<td>course materials &amp; resources</td>
<td></td>
</tr>
<tr>
<td></td>
<td>teacher qualifications and currency</td>
<td></td>
</tr>
<tr>
<td></td>
<td>strategic plan for teaching and learning</td>
<td></td>
</tr>
<tr>
<td></td>
<td>facilities and resources for teaching and learning</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Processes</th>
<th>elements and attributes which describe on-going conditions for successful teaching and learning</th>
<th>provision of appropriate learning experiences</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>work, community and professional engagement</td>
<td></td>
</tr>
<tr>
<td></td>
<td>assessment procedures</td>
<td></td>
</tr>
<tr>
<td></td>
<td>student support</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Outputs</th>
<th>elements and attributes which describe post-conditions from successful teaching and learning</th>
<th>continuous improvement in teaching processes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>reflective practice and ongoing commitment to continuous improvement in teaching processes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>graduates are employable in various ways</td>
<td></td>
</tr>
<tr>
<td></td>
<td>graduates can demonstrate outcomes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>course satisfaction and attitudes</td>
<td></td>
</tr>
</tbody>
</table>

Marshall Framework for Leading and Managing the Development of Organisational Environments to Support Sustainable and Effective Use of ICTs in Teaching and Learning

It has been noted that many prior efforts to encourage and support early adopters of e-learning tools through the use of special initiatives such as seed funding have not succeeded in assisting organisations to adopt such technologies more systematically. Marshall (2004) has proposed a framework of seven guiding principles to assist those with the responsibility of leading and managing the development of an organisational environment to support the sustainable and effective use of ICTs in teaching and learning. Table 4 summarises the framework (Marshall, 2004).

Table 4 – Marshall’s framework for Sustainable and Effective Use of ICTs in Teaching & Learning.

1. Be sure to keep the real issue that you need to address central to your efforts

The central issue for leaders and managers attempting to develop organisational environments to support sustained and effective use of ICTs in support of teaching and learning is to ensure that their institutions develop and maintain a capacity amongst their staff, at all levels, and in all organisational units, to draw upon scholarly, evidence based understandings of teaching, learning, and curriculum development, to address substantial problems related to the development of policy and practice in teaching and learning.

2. Be sure to adopt a whole of enterprise approach to the resolution of the problem

In addition to the development of staff, development (in a coherent way) will be needed in a number of other key areas, including, but not limited to:

- organisational structures
- policy and planning processes for teaching and learning development
- curriculum frameworks
- teaching support services for staff
- learning support services for students
- the technological infrastructure to support teaching and learning (including enterprise level systems)
- financial management strategies
- space management strategies
human resource management strategies
organisational culture.

3. Be sure to cast this problem as a problem of the institution, its faculties/departments, and staff

Assist the staff of your organisation to understand:
- why this is a whole of organisation problem
- what the implications for change and development are likely to be for the institution and each of its work/organisational units
- how they (individually and collectively) will be expected, and need, to change and develop their current practice.

Establish clearly defined accountability frameworks for the development of institutional, faculty, departmental, and individual capacity to effectively utilise ICTs in teaching and learning. Embed these in annual cycles of performance review at each of these levels.

4. Ensure that your institution as a whole, and each of its organisational units, operate effectively as “learning organisations”

The benefits of such an approach are many, but three particular advantages are worth mentioning here. This approach:
- empowers and enables staff by putting control of the processes for (a) identifying the need for change or development; (b) planning and implementing strategies for change and development; and (c) reviewing performance and effectiveness in realising the intended outcomes of the change or development, into the hands of those closest to the need for development or change
- ensures that processes of teaching and learning development (like research development) are directly integrated into the routine work of staff and their organisational units (an not seen as an add on to normal workload)
- ensures that individuals and organisational units develop the knowledge and capacity to become increasingly self sufficient in identifying and resolving problems related to teaching and learning in general, and e.teaching and e.learning in particular.

5. Base your decisions, policies, and practices on critical, scholarly, evidence based, multi-dimensional analyses and NOT taken for granted untested assumptions, values and beliefs about:
- teaching
- learning
- the contributions that ICTs can make to teaching
- the contributions that ICTs can make to learning
- the best ways to develop teaching
- the best ways to develop learning
- the best ways to support the development of teaching
- the best ways to support the development of learning
- the best ways to support the use of ICTs in teaching
- the best ways to support the use of ICTs in learning.

6. Use a range of policy instruments that provide both the short term results expected by stakeholders and the long term sustainable capacity for effectively using ICTs in teaching and
learning

Such a process will require the use of a combination of policy instruments:
- those designed to provide the short term “wins” that stakeholders will be expecting, and need, to remain motivated and committed to the process of change (e.g., mandates, inducements, or dissemination strategies), as well as
- those designed to effect the desired long term changes in our institutions (e.g., capacity building and system changing strategies).

7. Develop policies, strategies, and organisational cultures that are coherent and mutually support one another rather than compete, undermine or limit each others’ effectiveness

White & Larusson/ECAR Strategic Directives for Learning Management System Planning

In a recent EDUCAUSE Center for Applied Research (ECAR) Research Bulletin (White & Larusson, 2010), it was observed that most major universities now maintain some form of LMS, that these LMSs are a prominent feature of the learning environment, and in many institutions the domain of influence of the LMS is expanding. Moreover, they note that as it becomes easier for both staff and students to customise these systems to their own needs, and as pedagogies adapt to the affordances offered by educational technologies, it is inevitable that LMSs will continue to evolve and change. It was against this background that White & Larusson (2010) undertook a large investigation of the LMS literature and identified thee principle capabilities claimed for LMSs: transmission, evaluation and interaction. By assessing the utility of an LMS to accomplishing these three tasks, they present nine directives (given in Table 5) that they claim can assist in strategic planning for future LMS applications and beyond.

Table 5 – White & Larusson/ECAR Strategic Directives for LMS Planning.

1. **Build the system around faculty and student needs.** No matter what the function—transmission, evaluation, or interaction—LMSs, like politicians, must cater to a broad spectrum of constituents. While students are ultimately the final beneficiary of any pedagogical refinement, educators are more likely to be affected by sudden changes to an LMS platform. Any change that has an impact on the practice of teaching has potential consequences for how students are taught, and thus how they might learn. Any proposed LMS should make an attempt to appeal to the priorities and needs of both faculty and students.

2. **Take advantage of pedagogical adaptability.** LMSs, by design, facilitate a broad array of learning activities and accommodate a variety of teaching styles and pedagogical theories. With appropriate developer or IT support, open-source platforms allow an LMS to be modified. Although a platform such as Blackboard is configured with a host of preinstalled features, its functionality is analogous to that of an actual blackboard: instructors supply whatever content they wish, and they are restricted only by the dimensions of the frame. The LMS thus creates a pedagogical instrument that is, essentially, pedagogically neutral. Rather than allowing themselves to be constrained by an LMS, institutions should push the limits of the software to ensure the greatest amount of flexibility in teaching methodology.

3. **Allow learners to learn for themselves.** Based on the sheer volume of literature that discusses this theory, LMSs seem favorably aligned with the express goals of educational constructivism. Even as an LMS empowers an instructor to experiment with a variety of top-down approaches to managing course material, LMS use can encourage students to provide their own answers for how to best navigate the course. Yet precisely because many LMS features (no matter how adaptable)
can only be modified by faculty or administrators, it remains important to acknowledge this potential utility of LMSs, or to design exercises that reward student innovations that improve learning.

4. **Use the open-ended LMS to rethink pedagogy.** Because content is preserved and is accessible at any time, the LMS might be used to augment learning at any point during a student’s instruction. Prudent use of an LMS might thus address how the system itself can contribute to learning before, during, and after the period of conventional course interaction. The three broad types of categories for LMS use—transmission, evaluation, and interaction—might be seen to correspond to the chronological stages of a successful LMS implementation: material is first provided through transmission before the course has begun, evaluation tools tell us how students are learning while the course is in progress, and various interactive features can be accessed outside the classroom once the class session has ended.

5. **Develop hybrid strategies for face-to-face and distance learning.** LMSs are used in every educational environment, either as an auxiliary component of ordinary course work or as an independent means of fostering distance learning where conventional face-to-face communication might be impossible. This allows both instructors and administrators to design courses, platforms, and activities that make maximal use of students’ learning time.

6. **Explore the potential to evaluate more than performance.** Although the most obvious reason for using an LMS is that doing so might improve student performance, there is little agreement on what “improved performance” would entail. Most individual studies of LMS use seek to correlate student use of the LMS with higher scores on exams and course evaluations. Although this emphasis on grades is the priority of many researchers—and, it stands to reason, instructors—it has been suggested that students don’t necessarily use an LMS to attain better grades and don’t see their grades as a function of LMS use. Recent work has found that a task-technology fit evaluation of students’ response to technology revealed only a weak correlation between LMS use and grades. … A number of studies maintain that LMSs are now such a commonplace part of the educational experience that students no longer actually expect an LMS to improve their actual learning. If we do hope to effectively measure students’ reactions to LMS software, a simple evaluation of its utility, without attention paid to a specific pedagogical checklist, might no longer be enough.

7. **Incorporate external learning options.** Since students prioritize ease of use in their LMS interactions, it can be inferred that students use external communications channels more frequently than the channels within the LMS because the external channels are easier to use. By tapping into the already omnipresent network of social networks (from blogs to Facebook to Twitter and so forth), the marshalling of Web 2.0 technologies for pedagogical purposes might provide a more intuitive user experience while also allowing for a degree of user investment, customization, and ownership not possible in most commercial LMS applications.

8. **Allow the LMS to be used in ways that aren’t bound to the size of the classroom.** LMSs have the benefit of being able to accommodate not only a variety of activities but also a variety of sizes of activities. If an LMS-friendly activity can be applied to a group of 500 students with the same ease that it can be applied to 30, or 7, there is little size constraint to what an LMS can accomplish. In the same way that individualized learning constitutes just a component of a student’s learning experiences involving smaller groups or the whole class, so the “class” itself is just another arbitrary grouping that is part of a range of a student’s learning environment. Although most LMS design is formulated among individual courses, with the instructors of these courses maintaining absolute fiat over system content, it might be useful to think of an LMS as being able to accommodate
significantly larger or significantly smaller groups of users. LMS activities can be designed and implemented then for the course-based systems that are already in place, but with additional attention paid to the needs of other subdivisions of students.

9. Be ready for the end. Even while the range of features and systems incorporated into LMSs continues to expand, Web 2.0 technologies are encroaching upon the viability of the LMS in terms of cost, agility, support, and functionality. It remains possible that there might soon be a point where a static LMS itself is no longer needed. The LMS, because of its integration with other major institutional technology systems, has itself become an enterprise-wide system. As such, higher education leaders must closely monitor the possible tendency for LMSs to contribute only to maintaining the educational status quo. The most radical suggestion for future LMS use would dissolve the commercially enforced “course-based” model of LMS use entirely, allowing for the creation of either larger (departmental) or smaller (study groups) units of LMS access, as the case may require.

Charles Sturt University Educational Technology Framework
In response to its 2010 AUQA audit report that suggested that CSU develop a more comprehensive Online Learning Environment Plan, the 2010 CSU Educational Technology Framework was developed (Charles Sturt University, 2010). The Framework addresses on-campus, blended, online and distance education and CSU’s focus on education for the professions. Quoting from the framework document:

The Framework guides the governance, policy and practice needs for educational technology at CSU and defines educational technology use at CSU. It provides a structure through which planning and goal-setting will occur to guide future development; that is, it aims to provide a strategic and operational pathway for development to follow. …

The Framework interprets and informs the University Strategy and University Plans to ensure the development, provision and use of educational technology advances learning and teaching towards positioning CSU as a leader in the provision of flexible and blended learning and teaching. It positions educational technology to support professional education, to enhance participation and a successful student experience. As such, it integrates and informs Faculty educational technology needs and the related support requirements of the Divisions. …

The Framework provides a coordinated means to identify and respond to current and emerging requirements for educational technology across CSU’s campuses and sites, in order to respond to the needs and expectations of CSU students and the changing needs of the higher education sector. The Framework ensures that learning and teaching innovation and development at CSU will encompass both innovation in pedagogical approaches to the use of educational technologies and the educational technologies themselves, with the emphasis on their role in collaboration, communication and mobility. As such, it links to CSU’s Flexible and Blended Standards. …

The Framework provides guidelines for the introduction and use of educational technologies, to ensure high quality learning and teaching practices and learning resources, and it leads to coordinated deployment of educational technology and productive work-processes. As such, it addresses the need to engender creative interest and enthusiasm in the use of educational technologies and support the appropriate uptake of educational technologies by the majority of teaching staff.
The framework is visualised as shown in Figure 2, and contains a large amount of information (admittedly specific to CSU’s context) under the following broad outline:

- A vision for the use and research of educational technologies
- Key drivers
- Key values and principles of using educational technologies
- Principles governing the introduction of new educational technologies
- Strategies for increasing the appropriate use of educational technologies
- Areas for development and review of policies to guide practice across CSU
- Principles and standards of the required systems environment and infrastructure
- Strategies for professional development and training
- Principles about support for the use of educational technologies
- The governance structure supporting educational technology including committees
- Support of CSU’s graduate attributes and curriculum principles
- High level indicators of successful educational technology use at CSU

![Figure 2 – The CSU Educational Technology Framework.](image)

**Australasian Council on Open, Distance and E-learning Benchmarks**

The ACODE e-learning benchmarks identify a range of uses and benefits that their adoption might confer on an institution, including as, “[a] framework for quality assurance purposes” (Australasian Council on Open Distance and E-learning, 2007, p. 5). The purpose of the benchmarks is to support continuous quality improvement in e-learning. The approach reflects an enterprise perspective, integrating the key issue of pedagogy with institutional dimensions such as planning, staff development and infrastructure provision. The benchmarks have been developed for use at the enterprise level or by the organisational areas responsible for the provision of leadership and services in this area. Each benchmark area is discrete and can be used alone or in combination with others. Benchmarks can be used for self assessment purposes (in one or several areas), or as part of a collaborative benchmarking exercise.

The benchmarks cover the following eight topic areas:

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; and
8. Student support for the use of technologies for learning (Australasian Council on Open Distance and E-learning, 2010).

Each benchmark includes a Scoping Statement, a Good Practice Statement and a summary list of general Performance Indicators (PIs). Institutions can customise the benchmarks by replacing or adding to these Local Performance Indicators (LPIs). Each Performance Indicator then comprises Performance Measures. Each measure is rated on a 5 point scale (where level 5 indicates good practice). There are five statements that represent progress toward good practice (as represented by an indicator), with some represented as a matrix. Service areas/ or units within universities can complete a self-assessment of current practice using these indicators, noting that it is not necessary to aspire to best practice on all.

For example, Benchmark 2: Planning for, and quality improvement of the integration of technologies for learning and teaching is particularly relevant to this project.

**Scoping Statement**: There is a need for institution wide quality assurance processes to ensure the appropriate use of technologies in learning and teaching. This will include planning, implementation, evaluation and feedback loops.

**Good Practice Statement:**
Institutions support and encourage the appropriate use of technology in learning and teaching through strategic planning processes at all levels of the institution. The focus is continuous improvement through systematic and regular evaluation of implementation strategies and outcomes. Such evaluation will in turn inform future planning.

**Performance Indicators:**
1. Institution wide processes for quality assurance are in place and in use to integrate technologies in learning and teaching.
2. Institution and Faculty plans are aligned with institution policy for the use of technology in learning and teaching.
3. Operationalisation is planned and evaluated.
4. Planning and quality improvement is resourced.
5. Collaboration for integrating technology in learning and teaching occurs across key functional areas.
6. Evaluation cycles are in place to measure key performance indicators for all key stakeholders.
7. Outcomes are reported to all levels of the institution.
8. Evaluation feedback is integrated in planning for continuous improvement purposes.

**Performance Measures**: (for performance indicator 1; measures also exist for other indicators)

<table>
<thead>
<tr>
<th>Process in place</th>
<th>Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. None</td>
<td>None</td>
</tr>
<tr>
<td>2. Limited</td>
<td>Occasional/infrequent</td>
</tr>
<tr>
<td>3. Moderate</td>
<td>Moderate</td>
</tr>
<tr>
<td>4. Extensive</td>
<td>Frequent</td>
</tr>
<tr>
<td>5. Comprehensive</td>
<td>Systematic</td>
</tr>
</tbody>
</table>
ITGI Control Objectives for Information and Related Technology (COBIT™) Framework

COBIT is an IT governance framework developed by the IT Governance Institute. The overview of the COBIT 4.1 specification (IT Governance Institute, 2007) notes:

For many enterprises, information and the technology that supports it represent their most valuable, but often least understood, assets. … IT governance is the responsibility of executives and the board of directors, and consists of the leadership, organisational structures and processes that ensure that the enterprise’s IT sustains and extends the organisation’s strategies and objectives. Furthermore, IT governance integrates and institutionalises good practices to ensure that the enterprise’s IT supports the business objectives. … [COBIT] provides good practices across a domain and process framework and presents activities in a manageable and logical structure. COBIT’s good practices represent the consensus of experts. They are strongly focused more on control, less on execution.

The full COBIT framework is very detailed, but seeks to contribute to the success of IT systems by implementing control system that:

- Makes a link to the business requirements
- Organises IT activities into a generally accepted process model
- Identifies the major IT resources to be leveraged
- Defines the management control objectives to be considered.

The COBIT framework identifies key governance responsibilities (strategic alignment, value delivery, resource management, risk management and performance measurement) and provides tools/mechanisms for achieving those responsibilities. Table 6 summarises these governance responsibilities and indicates the applicable (primary and secondary) enabling mechanisms.

Table 6 – Governance focus areas and applicable enabling mechanisms.

<table>
<thead>
<tr>
<th></th>
<th>Goals</th>
<th>Metrics</th>
<th>Practices</th>
<th>Maturity Models</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategic alignment</td>
<td>P</td>
<td>P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Value delivery</td>
<td>P</td>
<td>P</td>
<td>S</td>
<td>P</td>
</tr>
<tr>
<td>Risk management</td>
<td>S</td>
<td>P</td>
<td>S</td>
<td></td>
</tr>
<tr>
<td>Resource management</td>
<td>S</td>
<td>P</td>
<td>P</td>
<td></td>
</tr>
<tr>
<td>Performance measurement</td>
<td>P</td>
<td>P</td>
<td></td>
<td>S</td>
</tr>
</tbody>
</table>

P=Primary enabler  S=Secondary enabler

The COBIT framework is structured around 34 IT processes that arise from four key domains of the management of IT - i) plan and organise; ii) acquire and implement; iii) deliver and support; and iv) monitor and evaluate. Figure 3 gives a summary of the overall COBIT framework, and indicates the relationship between the key IT processes and management domains.
The full COBIT framework is a complete system for controlling and managing each of the 34 identified IT processes by providing the following detailed information for each of the processes:
1. a process description summarising the process objectives, with the process description represented in a waterfall. This page also shows the mapping of the process to the information criteria.
criteria, IT resources and IT governance focus areas by way of P to indicate primary relationship and S to indicate secondary;
2. control objectives for the process;
3. process inputs and outputs, RACI (Responsible, Accountable, Consulted and Informed) chart, goals and metrics; and
4. the maturity model for the process.

**Marshall’s e-Learning Maturity Model**
The e-learning maturity model (eMM) (Marshall, 2007) is premised on the idea 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 and able to be sustained and built upon. Capability, in the context of this model, refers to the ability of an institution to ensure that e-learning design, development and deployment is meeting the needs of the students, staff and institution. Capability includes the ability of an institution to sustain e-learning support of teaching as demand grows and staff change. The framework embodied in the eMM is based on the Capability Maturity Model (CMM) and SPICE (Software Process Improvement and Capability dEtermination).
The eMM divides the capability of institutions to sustain and deliver e-learning up into five major categories or process areas – see Table 7.

<table>
<thead>
<tr>
<th>Process category</th>
<th>Brief description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning</td>
<td>Processes that directly impact on pedagogical aspects of e-learning</td>
</tr>
<tr>
<td>Development</td>
<td>Processes surrounding the creation and maintenance of e-learning resources</td>
</tr>
<tr>
<td>Support</td>
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Processes define an aspect of the overall ability of institutions to perform well in the given process area, and thus in e-learning overall. The claimed advantage of this approach is that it breaks down a complex area of institutional work into related sections that can be assessed independently and presented in a comparatively simple overview without losing the underlying detail. Each of the process categories in Table 7 are further expanded into a range of process areas, given in Table 8.

| 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

In the eMM, processes are achieved through the synergistic interaction of five dimensions of capability, as outlined in Table 9. Each process is further broken down within each dimension into practices that are either essential or just useful in achieving the outcomes of the particular process from the perspective of that dimension. These practices are intended to capture the key essences of the process as a series of items that can be assessed easily in a given institutional context. The practices are intended to be sufficiently generic that they can reflect the use of different pedagogies, technologies and organisational cultures. The eMM is aimed at assessing the quality of the processes - not at promoting particular approaches. Along with the practice statements each process description includes exemplars of practice performance designed to assist the assessment process by providing examples of capability performance – see Figure 4.

Table 9 – eMM processes dimensions.

| Dimension 1 (Delivery) | | | | |
| --- | --- | --- | --- |
| Dimension 1 (Delivery) is concerned with the creation and delivery of process outcomes. Assessments of this dimension are aimed at determining the extent to which the process is seen to operate within the institution. It is important to emphasise that institutions can have extremely effective processes operating within this dimension, but in the absence of capability in other dimensions there is risk of failure or unsustainable delivery and wasting resources through needless duplication. |

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

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

**Dimension 4** (Management) is concerned with how the institution manages the process implementation and ensures the quality of the outcomes. Capability within this dimension reflects the extent of measurement and control of the outcomes and the way in which the practices of the process are performed by the staff of the institution.

**Dimension 5** (Optimisation) captures the extent an institution is using formal approaches to improve capability measured within the other dimensions of this process. Capability of this dimension reflects a culture of continuous improvement.

When conducting an assessment each practice is rated, with reference to the exemplars, for performance from ‘not adequate’ to ‘fully adequate’ (see Figure 5). The ratings at each dimension are done on the basis of the evidence collected from the institution and are a combination of whether or not the practice is performed, how well it appears to be functioning, and how prevalent it appears to be. Table 10 provides the criteria on which eMM capability assessments should be made.
A rating of **Not Adequate** indicates that there is currently no evidence of the practice occurring in the institutional context nor usually a recognition of the practice outcomes in normal institutional activities. It suggests that the institution needs to acknowledge the practice outcomes and assign responsibility for their achievement formally.

A rating of **Partially Adequate** indicates that major shortcomings or limitations in practice outcomes are evident. This commonly occurs as a result of a failure to formally assign responsibility for their achievement or as a consequence of using outdated or face-to-face systems in the context of e-learning.

A rating of **Largely Adequate** indicates that the practice outcomes are being achieved but that more formalisation is needed to ensure sustainability or that a more systematic consideration of activities has been lacking. This can occur as a result of an aging first generation of e-learning systems or investment not being actively re-examined and maintained.

A rating of **Fully Adequate** indicates that the process outcomes are currently being clearly and sustainably addressed and achieved. This is not an excuse for complacency as the rapid pace of change in e-learning means ongoing focus and investment is necessary in all areas However it does suggest that new resources or investment can usefully be directed elsewhere in the immediate future.

**Scott QA and Evaluation Framework for Learning and Teaching in Higher Education**

In a commissioned review of research on university student engagement and satisfaction with learning, Scott (2008) proposed a four level quality evaluation framework, summarised in Figure 6. Figure 6 indicates that an effective approach to optimising retention and productive learning in higher education is one that assures:

- the quality of the design of the course concerned (for example. its relevance, likelihood to engage students, its sequencing, coherence, and the quality of its assessment);
- the quality of the staff allocated to it and the extent to which the various resources and support systems necessary for it to work are appropriate and in place; and
- that what was intended is actually being delivered consistently and effectively. (Scott, 2008)

Judgements of quality at levels one and two in Figure 6 are about inputs, and those at levels 3 and 4 are about outcomes. According to Scott, the most telling measures of quality standards reside at level 4. Table 11 provides additional explanation about the evaluation framework. While this framework is not specifically about OLEs, within the broader investigation of quality in Australian higher education Scott does address the issue of ICT-enabled learning, and notes the importance of online learning designs.
Figure 6 – Four Level Quality Assurance and Research Framework for Learning and Teaching.

Table 11 – Details of the Four Level Quality Assurance and Research Framework.

| **Level 1: Quality of Design** |  
| Evaluating quality at this level involves making judgements about the relevance, desirability, feasibility and likelihood that a proposed learning program will engage students in productive learning and retain them. Quality criteria at this level include: |
| - Relevance, including consistent theory-practice links and a focus on the capabilities found to count most for successful performance in early professional or disciplinary practice, along with the key graduate attributes the University wishes to see developed; |
| - A direct focus in assessment on these capabilities with particular use of problem based assessment and learning tasks; along with mechanisms to ensure prompt and constructive feedback, and transparent marking; |
| - Using the right combination of those just-in-time, just-for-me, self-directed and active learning methods identified as a ‘best aspect’ in the CEQuery studies for the field of education concerned. |
| - Clear up-front management of student expectations on what the university will (and will not) provide and, in particular, how assessment works - including what different levels of assessment performance (standards) look like in the particular subject being studied; |
| - A clear course direction and processes for ensuring that various units of study in the program complement each other and fit together into an integrated whole; |
| - Putting in place mechanisms to ensure that both academic and administrative staff are accessible, committed, responsive, knowledgeable and that teaching staff are competent teachers and student focused; |
| - Ensuring that learning support, library and administrative systems are directly aligned to the program, reliable and easily accessed; and |
| - Confirming that the times and locations for learning make access to the program and the university as convenient and productive as possible. |

| **Level 2: Quality of Resourcing and Support** |  
| Evaluating Quality at this level involves making judgements about what sorts of infrastructure, IT, learning support & resources, library resources, administrative systems, staff and staff development programs are necessary to support the consistent and effective delivery of the program as approved at level one. |
| Key indicators at this level centre on the cost-efficiency, alignment, relevance and quality of the resources and support systems to be used. In a period of rapid climate change this now also entails giving consideration to a relatively new set of issues concerning the carbon cost of having purpose- |
Level 3: Quality of Implementation
Evaluating quality at this level involves making judgements about the extent to which the program’s design and the resources allocated to support it are being put consistently and successfully into practice.

The key measures here focus on feedback from students, especially on questions related to the key quality tests applied during program design (see level one). There is increased potential to use qualitative data not just quantitative data at this level and to self-validate quantitative survey items by asking students to rate their importance as well as their performance.

Data gathered at this level is especially useful for improving the quality of implementation but it is a less valid source for proving quality – the key tests for which lie more at level 4.

Level 4: Quality of Impact
Evaluating quality at this level involves making judgements about the extent to which the university experience for students has consistently developed the capabilities that count for early career professional or disciplinary performance, along with the key graduate attributes identified in the university’s mission. To do this assessment has to be both valid and reliable. And it is here that the issues raised by writers like Sullivan and Rosin and our own studies of successful graduates in nine professions have relevance.

Other key impact indicators that can be used include benchmarked retention; assessment of the quality subsequent professional performance of graduates; including employer satisfaction with them; the number of students going on to successful further study; and comparative graduate salaries. The relative weight of other, broader impact indicators like profitability, income, subsequent demand and staff commitment and retention is increasing.

Summary
Quality may be an elusive and subjective concept, but there are well understood generic definitions and process for the management, assurance and improvement of quality. Ultimately, quality can be whatever the relevant stakeholders agree that it should be, but it must be quantifiable – if it cannot be measured, it cannot be controlled or enhanced. It is important to include the views of the end users in the agreed meaning of quality, because regardless of what is agreed in theory about quality, it is the end users’ perceptions at the point of engagement with the service or product on offer that determine their assessment of quality, and hence what rating they might give it in an evaluation of quality. A key message that comes from the literature on quality is that many areas of an organisation (including those that are distant from the end user) may have an influence on quality, and that effective management of quality requires a comprehensive conception of the contributors to the value/quality in the final service or product offered. There are a range of frameworks that can be found in the literature that provide useful perspectives on quality management as it applies to OLEs. The precise form of quality management framework employed will depend on the system being controlled and the purposes for that control, however, generically, an OLE quality management framework should:
• identify areas and processes of the institution that influence system performance and quality;
• provide a mechanism for the quantitative assessment/measurement of system quality performance;
• enable internal and external benchmarking for improvement; and
• highlight areas, functions, processes and mechanisms that might be improved for overall quality enhancement.

In addition, the related literature provides some guidance on the design of such frameworks, i.e., Charles Sturt University (2010) and the validation of such frameworks, i.e., Inglis (2008).

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References


