



E-learning quality assurance: a process-oriented lifecycle model

E-learning
quality
assurance

M'hammed Abdous

*Center for Learning Technologies, Old Dominion University,
Norfolk, Virginia, USA*

281

Abstract

Purpose – The purpose of this paper is to propose a process-oriented lifecycle model for ensuring quality in e-learning development and delivery. As a dynamic and iterative process, quality assurance (QA) is intertwined with the e-learning development process.

Design/methodology/approach – After reviewing the existing literature, particularly focusing on QA frameworks, procedures, and methodology, a process-oriented model structured around three sequential non-linear phases is presented: before: planning and analysis; during: design, prototype and production; and after: post-production and delivery. This model is supported by an advanced information system used to organize, track, collect, and generate reports regarding QA changes and needed updates.

Findings – Following a process-oriented lifecycle approach, the paper emphasises that QA requires a supportive environment that explicitly recognizes quality as a work value and as an enabler for reaching organizational goals.

Practical implications – The paper proposes a practical QA model which follows e-learning development phases. For each development phase, practical steps, including sample checklists, are recommended.

Originality/value – The proposed model has the potential to transform QA from a static, after-the-fact state to a more iterative and dynamic state, thus promoting a culture of ongoing self-improvement, rather than of circumstantial compliance, within the e-learning community.

Keywords Quality, Quality assurance, E-learning, Higher education

Paper type Conceptual paper

Introduction

In the midst of the technological paradigm shift reshaping institutions of higher education (HE), the question of quality assurance (QA) is at the forefront of university leadership concerns worldwide (Newton, 2007; van Damme, 2002). The resurgence of this old/new quality debate is driven by the confluence of contextual factors, such as the competitive global economy, external pressures for greater accountability and responsiveness, financial constraints and massification effects. Indeed, these factors are pressuring HE institutions to implement QA procedures in order to improve teaching, learning, research, and services, particularly for e-learning[1] which sometimes still suffers from the stigmas (occasionally founded) of poor quality and low standards (Chua and Lam, 2007).

This increased attention has resulted in a proliferation of guidelines, recommendations, procedures and checklists aiming at compliance, accountability, and improvement (Hodson and Thomas, 1999), but also at regaining stakeholders' confidence by reassuring them that e-learning courses are equally as rigorous as courses delivered in a traditional face-to-face format (Hope, 2001).

While most universities have implemented some form of internal self-regulated QA procedures, it is hard to find a comprehensive and practical QA framework that systematically covers HE inputs, processes and outputs (Inglis, 2005). These efforts are



occasionally initiated in response to external requirements and are often limited to the administrative-side operations of HE institutions (Aly and Akpovi, 2001). Self-implemented QA procedures are sometimes unintegrated and can be too narrowly focused on student learning outcomes (Welsh and Dey, 2002), consequently omitting critical input variables and the processes leading to those outcomes. As for external evaluations, in addition to their being poorly integrated with existing institutional strategic planning processes (van der Westhuizen, 2007), their focus is on compliance and on accountability, resulting in a limited effect on the student learning experience (Harvey and Newton, 2004).

While recognizing that the holistic nature of HE entails a systemic QA approach covering inputs, processes and outputs[2] this paper's focus is on the foundational process of e-learning development and delivery. A process-oriented lifecycle QA model, one in which QA is dynamically and iteratively intertwined with the e-learning development process, is proposed. This approach recognizes, along with Oliver and Herrington (2003) that the most influential factors affecting the quality of the e-learning experience are the purposeful and informed design of appropriate learning tasks and the inclusion of resources to scaffold and support interaction and learning. From this perspective, this paper joins Ellis *et al.* (2007) in their choice of a process-oriented approach in the institutional implementation of QA in e-learning.

By acting on the design of the production and the delivery of e-learning courses, QA is transformed from a static, after-the-fact state to a more iterative and dynamic state, one which promotes a culture of ongoing self-improvement instead of one of circumstantial compliance. In this regard, the proposed model targets the practices of those "front-line academics" (Newton, 2002) who are involved in shaping the e-learning experience: professors, instructional designers and instructional technologists. Ultimately, it is hoped that this model will both contribute to and enrich the debate about e-learning quality by providing a practical QA model potentially capable of addressing some of the scepticism surrounding e-learning.

As it attempts to articulate these goals, this paper begins by clarifying the concept and context of quality and QA. Next, it examines the literature pertaining to QA frameworks, procedures and methodology. Based on this clarification and review, a process-oriented lifecycle QA model structured around three sequential non-linear phases is presented, which includes:

- (1) before: planning and analysis;
- (2) during: design, prototype and production; and
- (3) after: post-production and delivery.

The main goal of this paper is to propose a systematic and practical model capable of enabling institutions of HE to integrate QA into e-learning development and delivery and to share lessons learned from a trial implementation of this model.

What is quality?

The definitional challenge associated with the concept of quality, along with its derivatives (including QA, quality control, quality audit, total quality management, and quality enhancement), stems from the juxtaposition of internal and external university stakeholders' interests, expectations, and requirements. These requirements and expectations, occasionally contradictory, are complex and contribute to the conceptual

and operational imprecision which surrounds any attempt to define quality. In that vein, Harvey and Green (1993) view quality as stakeholder-relative; hence, it is not a unitary concept, but a rather elusive (Green, 1994), slippery and multi-dimensional (Giertz, 2001) concept. In this regard, van Damme (2002) points out that, despite 20 years of operational experience in assuring quality in HE, no consensual definition of this rather vague and controversial concept is universally accepted (Cheng and Tam, 1997). Similarly, Scott (1994) asserts that there is no authoritative definition of quality in HE (Newton, 2007). Quality is a rather notoriously ambiguous term (Pounder, 1999). However, one of the earlier categorizations of quality proposed by Harvey and Green (1993) seems to generate some consensus that quality can be perceived as added value, fitness for purpose, customer satisfaction, or positive transformation.

What is quality assurance?

As a subset of the semantic cluster of the word “quality,” “quality assurance” seems to be less ambiguous. As an approach focusing on processes, QA is defined by the International Organization for Standardisation (2005) as “that part of quality management focused on providing the confidence that quality requirements are being fulfilled.” Harman and Meek (2000, p. vi) define QA as the “systematic management and assessment procedures used to ensure achievement of quality outputs or improved quality.” Close to this meaning is the proposed definition from the Council for Higher Education Accreditation (2002a) of QA as a “planned and systematic review process of an institution or program to determine that acceptable standards of education, scholarship and infrastructure are being maintained and enhanced.”

From this quick review of quality and QA definitions, the lack of clarity surrounding the concept of quality is mainly nurtured by its stakeholders’ perspective. Paradoxically, this lack of clarity carries a double-edged potential: on one hand, it is conducive to meeting the needs and interests of various internal and external stakeholders; on the other, it renders the concept of quality difficult to operationalize, because of its vagueness and imprecision. In contrast, while quality is subjected to multiple narratives and perspectives, QA seems to be both achievable and implementable as a methodology used to judge the achievement of organizational aims and objectives (Doherty, 2008).

Keeping this in mind, Newton (2007) advocates for a practical and “relativist” approach and acknowledges the relative nature of quality to stakeholders, to context and to the particular assurance mechanisms associated with quality, such as assessment, audit, and accreditation. Contrary to the traditional perspective which perceives QA as a mechanism used to avoid and anticipate faults or mistakes, the use of this pragmatic stakeholders’ approach is more likely to foster a culture of QA and ongoing improvement, particularly within the dynamic, diverse, and unpredictable context of HE. This leads to the next question: how to understand the contextual factors which affect QA?

Quality assurance in context

Although this paper argues for a QA model structured around e-learning development and delivery phases, it is hard to isolate this process from the contextual factors influencing it. Understanding the context is of paramount significance, not only because it frames the QA process, but also because it dictates the standards used

during that process, particularly when translating the existing standards into operational checklists. According to Newton (1999, cited in Newton, 2007, p. 19), “any quality assurance model, method or system will always be affected by situational factors and context.” To understand the dynamic of the contextual factors affecting QA, a metaphor using threefold-layered circles is proposed (Figure 1).

From this figure, it is clear that, at the centric level, QA is a core value. It is perceived as a dynamic, iterative and ongoing process. Rather than serving as an after-the-fact approach, it can be embedded into the daily practices of the front-line academics shaping the e-learning experience.

At the concentric circle level, variables such as technology, accreditation, accountability, financial pressures, and student mobility shape the QA process. In particular, hardware and software innovations are constantly pressuring existing teaching and learning strategies. The pressures exerted by the burgeoning of technology permeate the culture of HE, with consequential implications on the QA narrative, particularly in determining standards and guidelines for communication and collaboration on one side and for accessibility, usability and interface design on the other side.

At the outer circle level, market forces, employers, transnational education and diploma mills are among the most common issues shaping QA. A new generation of HE providers encompassing for-profit institutions, textbook publishing corporations and transnational providers is pressuring traditional universities to distinguish themselves by offering quality programs. As a marketing and recruiting tool, QA is becoming a seal of distinction in the midst of the competitive and growing e-learning market.

Following this line of thinking, the QA context is a rather a complex web of interactions and dynamics amid several interconnected variables. The inability to acknowledge and

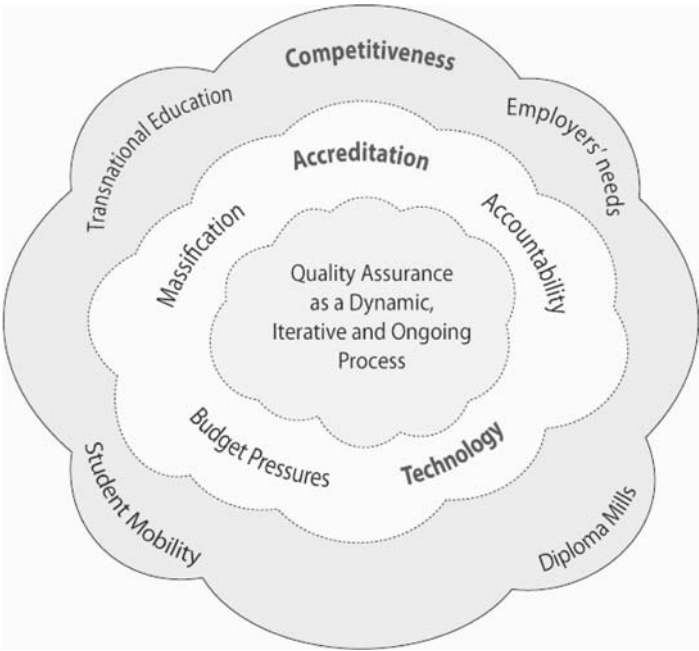


Figure 1.
Situational factors
affecting QA

comprehend these dynamics and the forces shaping the debate and narrative about what constitutes quality is likely to hinder the implantation of QA into e-learning.

From accountability to improvement

Before undertaking the complex task of reviewing some of the abundant literature on QA, it is noteworthy to point out the evolution of the concept of QA from accountability to improvement. In his ethnographic study, Newton (2002, p. 8) distinguishes two successive phases of quality implementation. The first phase, during the early 1990s, was burdened with bureaucracy and accountability and was particularly interested in looking for a replicable blueprint. During this phase, the concept of quality was (and still is, to some extent) loaded, both politically and ideologically. In the second phase, which occurred in the mid-1990s, the awareness of quality was structured around what Newton calls “an alternative understanding and perspective on ‘quality’ and ‘quality policy’ as *implemented*, based on the *situated* perceptions of quality of front-line academics.” This evolution implicitly expresses the irreconcilable tension between accountability and improvement (Newton, 2002), if not the inability of accountability alone to provide a sufficient basis for delivering quality improvement.

In addition to accountability and improvement, quality is often used as a marketing and recruiting tool (Boyle and Bowden, 1997). Brennan and Shah (2000) note that quality is used to assign institutional status, to facilitate student transfer and mobility, and to enable international comparisons.

From a procedural stance, Jeliaskova and Westerheijden (2001) point out that, with minor variation, external QA systems follow a four-stage model which starts with a request from an external coordinating agency and is followed by the submission of a self-evaluation report, a peer visit and a public report.

From a methodological standpoint, Reichert (2007) proposes a matrix with three columns (accreditation, evaluation and benchmarking) structured around accountability, control, and improvement. At the institutional level, accreditation is widely used as a seal of approval and distinction, particularly in light of the growing presence of for-profit institutions in the HE sector. Similarly, evaluation is intended to help both with making strategic decisions and with steering resources under the pressures of budget constraints. Finally, benchmarking is used as a self-evaluation process (Jackson, 2001), and is used to increase awareness of competition, while allowing for the sharing and exchanging of experiences.

From an operational perspective, Bogue (1998) discerns the four contemporary QA categories listed as follows:

- (1) Traditional peer review evaluations are structured around three subcategories: accreditation, program review and ranking, and rating. Accreditation is the oldest non-governmental seal of quality in HE (Baker, 2002). According to Dodd (2004), accreditation is the most prominent of all accountability efforts, fostering improvement as well as accountability, and enabling participating institutions to receive governmental financial aid. For their part, Stensaker and Harvey (2006) note that accreditation, while criticized for overlooking the challenge of quality improvement, still provides internal and external legitimacy to institutions of HE.

Academic program review, the second sub-category, features self-study, and external peer review at the discipline, department, or program level. According to Bogue (1998), academics perceive this approach as futile, as it offers little

relationship to resource allocation or to decision making. Finally, the third category, ranking and rating studies, encompasses studies which, although widely publicized in the news, have been underutilized by students and accrediting agencies.

- (2) The assessment-and-outcomes movement focuses mainly on results, rather than on reputation. This movement's underlying policies mainly focus on increasing access to HE and enhancing public accountability for quality.
- (3) Total quality management is an approach borrowed from business practices which focuses on continuous improvement and student satisfaction. According to Becket and Brookes (2005), total quality management has the potential to capture both the internal and the external stakeholders' perspectives, enabling a comprehensive approach capable of assuring quality while facilitating change and innovation. However, because of the perceived disconnect between total quality management techniques and the education process (Srikanthan and Dalrymple, 2003), this approach is considered more applicable to administrative and student services.
- (4) Accountability and performance indicator reporting is requested, and is used, as a quality indicator. In this regard, enrolment trends, retention and graduation rates, job placement rates, and student and alumni satisfaction are used to measure HE's effectiveness and impact. According to Baker (2002), judgment of quality in HE has shifted from a traditional and implicit perception based on institutional reputation and characteristics to an explicit perception based on evidence of outcomes and achievements.

These categories and sub-categories depict common practices in traditional HE settings. In the early days of distance learning, QA frameworks, and methodologies were inspired by traditional on-campus education, with accreditation agencies using almost the same criteria for both distance education and on-campus education. This approach was justified by the perception that distance learning was merely an alternate delivery system (Council for Higher Education Accreditation, 2002b). However, pressures exerted by the contextual factors mentioned above (accreditation, technology, and competitiveness) have forced accrediting agencies and HE institutions to proactively implement rigorous and transparent QA procedures and guidelines.

Indeed, several agencies, such as the Quality Assurance Agency for Higher Education (1999), the Institute for Higher Education Policy (1999), the Council for Higher Education Accreditation (2002b), the Western Cooperative for Educational Telecommunications (2002), the European Association for Quality Assurance in Higher Education (2005), the Commonwealth of Learning (2005), and the United Nations Educational, Scientific and Cultural Organization (2005) have played a key role in shaping distance learning QA approaches. With a high level of similarities and comparability, these agencies have promoted the implementation of QA frameworks nationally and internationally, focusing mainly on improving the student learning experience (Belawati and Zuhairi, 2007). In her survey of QA practices in distance learning mega-universities, Jung (2004) highlights the emergence of a culture of quality, strengthening capacity-building to promote and implement QA systems while focusing on learning rather than teaching (Koul and Kanwar, 2006). In addition, Jung (2004) points out the variation observed in QA systems integration within existing university policy frameworks which is particularly reflected in the standards and criteria used at

different universities. At institutions that place utmost importance on accountability, predetermined standards and criteria are generally followed. At other institutions striving for self-improvement, less prescriptive general guidelines are often followed.

According to a report published by the Council for Higher Education Accreditation (1998), QA is defined in e-learning as “the means by which the institutions or providers set their program goals and measure results against those goals.” Indeed, as stated above, the resurgence of the quality debate, particularly inside e-learning, has generated a considerable body of knowledge reflecting various stakeholders’ perspectives regarding their understanding of quality and QA (Rekkedal, 2006). Following Hirumi’s (2005) matrix, which compares educational quality guidelines, as well as Wang’s (2006) review of existing QA best practices, five common categories are noted: institutional commitment, curriculum and instructional development, academic staff support, student support, and learning outcomes assessment. Overall, similarities tend to cover inputs and outputs, while dissimilarities tend to be process-related. According to Parker (2003), quality measures still rely on inputs such as the qualification of instructors and on outputs such as satisfaction ratings, and therefore still lack the ability to capture the “fundamental integrity of the online learning environment.” With this in mind, a process-oriented QA model based on development and delivery phases is proposed, following upon a belief that embedding QA within e-learning development is likely to improve the student e-learning experience, assuming that enabling conditions are provided.

Process-oriented lifecycle model for quality assurance in e-learning

Drawing upon the materials described above, a process-oriented model aimed at helping organizations to implement a QA process structured around the foundational process of e-learning development and delivery is proposed. In this regard, it is noteworthy to point out that the design, production, and delivery of e-learning require both a streamlined workflow and the collaboration of several specialists (subject-matter, instructional, and technical) working together in a team environment (Phillips, 2005). With this consideration in mind, the proposed QA model mirrors a centralized institutional framework for planning, designing, producing, and delivering e-learning courses. In this centralized model, content, design and technology are synergistically integrated, using a series of templates and checklists built on key ideas from research and practice (Abdous and He, 2008). The model (Figure 2) is structured around three sequential non-linear phases:

- (1) before: planning and analysis;
- (2) during: design, prototype and production; and
- (3) after: post-production and delivery.

In the planning and analysis phase, a project plan and a workflow diagram are used as QA tools to flowchart the development process and to clarify the timeline, assumptions, and expectations. This phase is critical in setting the stage for the proposed QA model, particularly in refining and updating course development templates and checklists. Indeed, this phase defines and sets the quality standards underpinning content collection templates and production checklists. In other words, it defines the constructs underlying the proposed QA model.

Subsequently, during the design/production phase, pre-designed content collection templates are used to ensure the appropriateness, comprehensiveness and consistency of

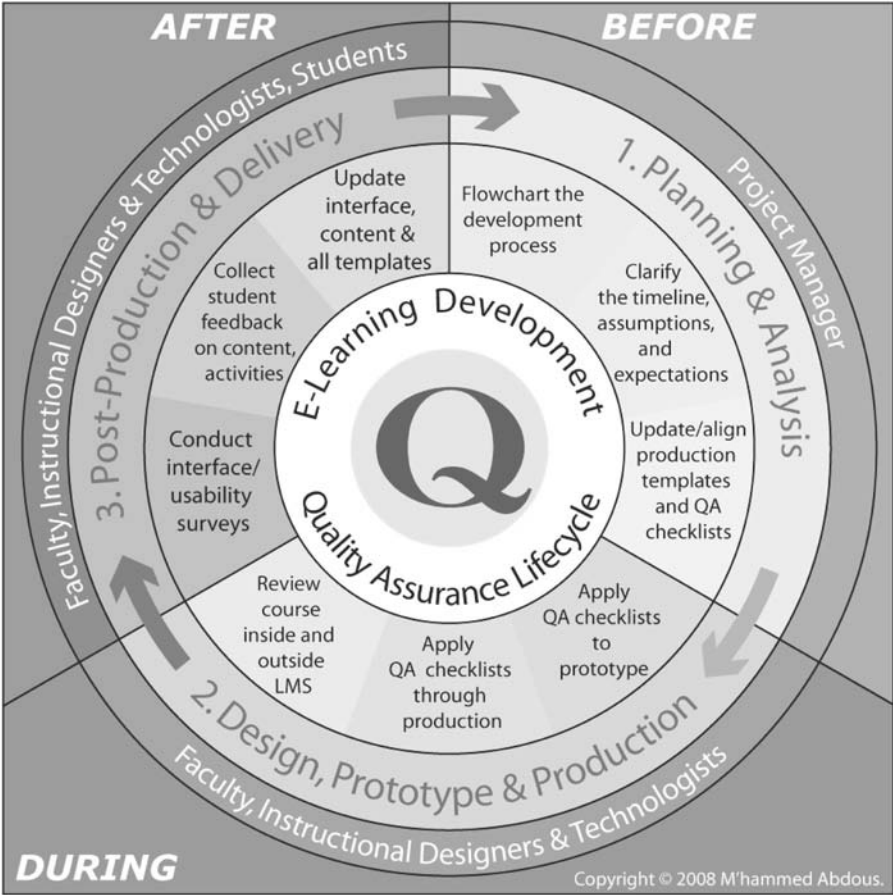


Figure 2.
Process-oriented lifecycle
model for QA in e-learning

the content. These templates include the critical elements of effective e-learning environments, such as the development of student-centred syllabi, the alignment of objectives with the content matrix, the use of engaging and diversified learning activities, the offering of opportunities for interaction and collaboration and, of course, the opportunity for meaningful assessment and feedback (Hosiea *et al.*, 2005). During this phase, tailored QA checklists are used by team members to ensure the application of the standards and guidelines identified in the first phase. Used as a screening device (Hosiea *et al.*, 2005), these checklists are designed and adapted by drawing on evidence from research-based standards and by studying best practices in instructional and web design. These templates are also intended to be used as self-assessment and improvement tools by professors, by instructional designers and by instructional technologists, without hindering creativity or freedom. Indeed, these templates and checklists are used throughout the process to ensure consistency and efficiency and to foster a culture of quality.

In parallel, to these content-related templates, several production templates and tools using PHP as an automation/scripting language and Adobe CS 3 as a production

toolbox are used. These ensure uniformity and consistency across the production process by providing pre-built-in features based on the standards identified in the first phase. For each production tool (text, images, audio, and video and animations), a detailed QA checklist is used by team members during the production phase. A total of 118 QA checklist items are used throughout the process (Figure 3).

To streamline this process, an advanced information system was developed, to organize, track, collect, and generate reports about QA changes and needed updates. By incorporating all of the checklists used during the production process, this system facilitates QA implementation, tracking, and reporting, while it reduces the number of clerical tasks associated with the process.

This information system enables designers to track and update the checklists associated with their roles in the production process. The system also generates QA summary reports by module, course, or degree program (Figure 4).

Finally, during the post-production and first offering phase of e-learning courses, interface usability and student feedback surveys are administered and collected. Data collected during this phase feeds back into the system to encourage the improvement of course, content, and activities (and, occasionally, templates, and checklists).

By mirroring the production process and by using pre-defined content and production templates, the model provides an operational framework that promotes QA as a daily practice. Supported by an advanced information system, this process-oriented model provides opportunities for continuous improvement and refinement in order to ensure an effective learning experience.

Lessons learned

As an operational QA framework, the proposed model requires a supportive environment that explicitly recognizes quality as a work value and as an enabler for reaching organizational goals, while it documents and provides support, guidance,

QUALITY ASSURANCE INFORMATION SYSTEM

The screenshot displays the 'QUALITY ASSURANCE INFORMATION SYSTEM' interface. At the top, there are three tabs: 'Course/Module Content', 'Learning Activities/Strategies', and 'Assessment and Feedback'. Below the tabs, a breadcrumb trail reads 'Course » PHP » 2008 » geol » 410 » Module 6'. The main section is titled '1. COURSE/MODULE CONTENT'. It contains a table with seven rows, each representing a checklist item. Each row has columns for 'Rating' and 'Status', and a 'Create Action' button. The items are:

	Rating	Status	options
1.1 CLT online courses production templates (syllabus & ocdt05guide.doc, etc.) are completed.	Acceptable	Completed	Create Action
1.2 Course/module content includes: overview, objectives, activities, resources, assessment criteria, interaction and collaboration opportunities, and summary.	Acceptable	Completed	Create Action
1.3 Course/module objectives/outcomes are listed.	Needs Revision	In-Progress	Create Action
1.4 Course/module content is complete and appropriate to learners' characteristics, background and level.	Acceptable	Completed	Create Action
1.5 Course/module content relates directly to learning outcomes.	Exemplary	Completed	Create Action
1.6 Course/module content is organized and sequenced clearly and consistently.	Not Applicable	Not Applicable	Create Action
1.7 Course/module learning plan options are explained: student-paced, instructor-paced.	Not Applicable	Not Applicable	Create Action

At the bottom of the table, there are three buttons: 'Continue >', 'Reset changes', and 'Checklist menu'. The footer of the page reads '© 2008 Center for Learning Technologies'.

Figure 3.
QA checklist example:
course module
content review

Figure 4.
QA information system
environment

QUALITY ASSURANCE INFORMATION SYSTEM

Course » PHP » 2008 » geol » 410 » Module 6

Project ID:	24
Title:	Module 6
Date created:	April 26, 2008, 6:06 pm
Last modified:	April 26, 2008, 6:06 pm
options	Go to checklists Checklists report Select a different project Quality Assurance Home

Select your role:
[Project Team Leader](#) | [Instructional Designer](#) | [Project Manager](#) | [Faculty](#)

© 2008 Center for Learning Technologies

reinforcement, and continuous improvement (Silimperi *et al.*, 2002). In accord with this important enabling condition, early trial implementation of the model offers some valuable lessons:

- (1) During the planning phase, clarifying quality expectations helps to set the QA implementation path. It is crucial to provide a clear picture of the overall quality requirements, expectations and process. In this regard, it is critical to keep three production considerations in mind:
 - Gain the buy-in of the academic staff by clarifying the overall process of content collection and by explaining the importance of each content collection template. Academic staff resistance often stems from a lack of understanding of the purpose of the process and from unwillingness to embrace new ways of developing courses.
 - Be sure that the academic staff understand the meaning of the different checklist items.
 - Help the production team members to reach a common understanding of the checklist items, to ensure that they will be applied systematically. As Newton (2007) argues, quality is contingent upon how it is used and experienced in practice by academics.
- (2) During the design/production phase, burdening the production team with additional checklists is likely to be counterproductive, unless roles and responsibilities are clearly identified and understood. In addition, the QA implementation must be supported by an information system which tracks and facilitates clerical tasks. Having a flexible and efficient information system is critical to the success of the QA model implementation.
- (3) During the delivery phase, a double consideration is required:
 - On the academic staff side, readiness and online teaching abilities have a significant impact on how e-learning content is delivered. Thus, providing both development opportunities and ongoing technical support is critical for an effective e-learning experience.

- On the student side, students' readiness, technical literacy, study strategies and tactics influence their level of interaction with the content. The author believes, with Ehlers (2004), that the outcome of any learning process does not hinge exclusively on the production process, but rather on student enablement and empowerment, by providing online orientations, ongoing support, and regular and systematic feedback collection.

With these considerations in mind, it is important to reiterate that the proposed model is an operational tool, a kind of roadmap which helps organizations implement efficient and systemic QA procedures. However, the success of its implementation hinges on key enabling variables including the clarification of quality requirements, a common understanding of QA checklists and the support of both professors and students.

Suggestions for future research

This paper began by highlighting the inefficacy of existing QA frameworks and procedures and by justifying the choice to structure a model around e-learning development and delivery. After shedding some light on quality and QA definitional issues, it reviewed the existing literature on QA mechanisms and frameworks. It is against this backdrop that a three-phase model which parallels the course development process has been proposed. This model is aimed both at moving quality from a static, after-the-fact state to a more iterative and dynamic state and at promoting a culture of ongoing self-improvement, instead of one of compliance. In other words, it is a model in which QA becomes embedded into the daily processes of "front-line academics," enabling it to penetrate the core activities of course, development operation (Hodson and Thomas, 2003). Ultimately, this approach has the potential to raise the overall quality of the e-learning experience, increase organizational efficiency for the units developing e-learning and address some of the scepticism that surrounds e-learning.

In recommending future research avenues, this paper supports the need for comprehensive research to examine both the effectiveness of the proposed model and its impact on students' e-learning experiences. More specifically, how and to what extent do e-learning courses which follow this model contribute to higher student outcomes? From a procedural perspective, further research is needed to examine the effectiveness of the information system designed to facilitate QA implementation, particularly by examining how the system contributes to the promoting and embedding of QA practices into daily routines. In other words, how does the proposed model contribute to the promotion of a culture of QA within units developing e-learning courses?

As a concluding comment, it should be said that although quality can be contested and challenged, and although its implementation varies contextually and requires enabling conditions, it remains clear that the QA debate will remain alive and will continue to drive competition within the HE sector.

Notes

1. As a generic concept, e-learning refers to any learning experience which mixes three interdependent dimensions: delivery and interaction tools (hardware and software); remote or/and face-to-face location; and synchronous or asynchronous meeting time. With minor nuances, this concept of "e-learning" can subsume other common concepts, including distance education, distance learning, distributed learning, online learning, e-education, virtual education, web-based learning, computer-based training, blended, and hybrid learning.

2. Typically, HE inputs include students, staff and resources; processes include curriculum design, teaching and learning methods, support, assessment and administration; and outputs include student results, graduation, employment, and satisfaction.

References

- Abdous, M. and He, W. (2008), "Streamlining online course development process by using project management tools", *Quarterly Review of Distance Education*, Vol. 9 No. 2, pp. 181-8.
- Aly, N. and Akpovi, J. (2001), "Total quality management in California public higher education", *Quality Assurance in Education*, Vol. 9 No. 3, pp. 127-31.
- Baker, R. (2002), "Evaluating quality and effectiveness: regional accreditation principles and practices", *The Journal of Academic Librarianship*, Vol. 28 No. 1, pp. 3-7.
- Becket, N. and Brookes, M. (2005), "Analysing quality audits in higher education", *Brookes eJournal of Teaching and Learning*, Vol. 2, available at: www.brookes.ac.uk/publications/bejlt/volume1issue2/academic/becket_brookes.html (accessed August 14, 2008).
- Belawati, T. and Zuhairi, A. (2007), "The practice of a quality assurance system in open and distance learning: a case study at Universitas Terbuka Indonesia (The Indonesia Open University)", *The International Review of Research in Open and Distance Learning*, Vol. 8 No. 1, available at: www.irrodl.org/index.php/irrodl/article/view/340 (accessed March 4, 2009).
- Bogue, G. (1998), "Quality assurance in higher education: the evolution of systems and design ideals", *New Directions for Institutional Research*, Vol. 25 No. 3, pp. 7-18.
- Boyle, P. and Bowden, J. (1997), "Educational quality assurance in universities: an enhanced model", *Assessment and Evaluation in Higher Education*, Vol. 22 No. 2, pp. 111-21.
- Brennan, J. and Shah, T. (2000), *Managing Quality in Higher Education: An International Perspective on Institutional Assessment and Change*, Open University Press, Buckingham.
- Cheng, Y. and Tam, M. (1997), "Multi-models of quality in education", *Quality Assurance in Education*, Vol. 5 No. 1, pp. 22-31.
- Chua, A. and Lam, W. (2007), "Quality assurance in online education: the universitas 21 global approach", *British Journal of Educational Technology*, Vol. 38 No. 1, pp. 133-52.
- Commonwealth of Learning (2005), *Quality Assurance in Open and Distance Learning*, Knowledge Series, available at: www.col.org/SiteCollectionDocuments/KS2005_QA.pdf (accessed March 4, 2009).
- Council for Higher Education Accreditation (1998), *Assuring Quality in Distance Learning: A Preliminary Review*, available at: www.chea.org/pdf/HED_Apr1998.pdf (accessed August 14, 2008).
- Council for Higher Education Accreditation (2002a), *Glossary of Key Terms in Quality Assurance and Accreditation*, available at: www.chea.org/international/inter_glossary01.html (accessed August 14, 2008).
- Council for Higher Education Accreditation (2002b), *Specialized Accreditation and Assuring Quality in Distance Learning*, CHEA Monograph Series, available at: www.chea.org/pdf/mono_2_spec-accred_02.pdf?pubID=246 (accessed August 14, 2008).
- Dodd, A. (2004), "Accreditation as a catalyst for institutional effectiveness", *New Directions for Institutional Research*, Vol. 123, pp. 13-25.
- Doherty, G. (2008), "On quality in education", *Quality Assurance in Education*, Vol. 16 No. 3, pp. 255-65.
- Ehlers, D. (2004), "Quality in e-learning from a learner's perspective", paper presented at the Third EDEN Research Workshop, Oldenburg, March 4-6, in *European Journal for Distance and Open Learning*, available at: www.eurodl.org/materials/contrib/2004/Online_Master_COPs.html (accessed August 14, 2008).

-
- Ellis, R., Jarkey, N., Mahoney, M., Peat, M. and Sheely, S. (2007), "Managing quality improvement of eLearning in a large, campus-based university", *Quality Assurance in Education*, Vol. 15 No. 1, pp. 9-23.
- European Association for Quality Assurance in Higher Education (2005), *Standards and Guidelines for Quality Assurance in the European Higher Education Area*, available at: [www.enqa.eu/files/ESG_3edition%20\(2\).pdf](http://www.enqa.eu/files/ESG_3edition%20(2).pdf) (accessed March 4, 2009).
- Giertz, B. (2001), "Anything goes? The concept of quality revisited", paper presented at The Sixth QHE Seminar, Birmingham, May 25-26, available at: www.qualityresearchinternational.com/papers/giertz.pdf (accessed August 14, 2008).
- Green, D. (1994), "What is quality in higher education? Concepts, policies and practice", in Green, D. (Ed.), *What is Quality in Higher Education?*, SRHE and Open University Press, Buckingham, pp. 3-21.
- Harman, G. and Meek, V. (2000), "Repositioning quality assurance and accreditation in Australian higher education", *Evaluations and Investigations Program Report 00/2*, Higher Education Division Department of Employment, Education, Training and Youth Affairs, Canberra, available at: www.detya.gov.au/highered/eippubs.htm#2000 (accessed August 14, 2008).
- Harvey, L. and Green, D. (1993), "Defining quality", *Assessment and Evaluation in Higher Education*, Vol. 18 No. 1, pp. 9-34.
- Harvey, L. and Newton, J. (2004), "Transforming quality evaluation", *Quality in Higher Education*, Vol. 10 No. 2, pp. 149-65.
- Hirumi, A. (2005), "In search of quality: an analysis of e-learning guidelines and specifications", *Review of Distance Education*, Vol. 6 No. 4, pp. 309-30.
- Hodson, P. and Thomas, H. (1999), "Towards an enterprise culture: will the quality assurance agency help or hinder?", *Higher Education Review*, Vol. 32 No. 1, pp. 375-85.
- Hodson, P. and Thomas, H. (2003), "Quality assurance in higher education: fit for the new millennium or simply year 2000 compliant?", *Higher Education*, Vol. 45 No. 3, pp. 375-87.
- Hope, A. (2001), "Quality assurance", in Farrell, G. (Ed.), *The Development of Virtual Education: A Global Perspective*, Commonwealth of Learning, Vancouver, available at: www.lgfl.net/imfundo/web/tech/documents/changingface/?verb=list (accessed August 14, 2008).
- Hosiea, P., Schibecib, R. and Backhaus, A. (2005), "A framework and checklists for evaluating online learning in higher education", *Assessment and Evaluation in Higher Education*, Vol. 30 No. 5, pp. 539-53.
- Inglis, A. (2005), "Quality improvement, quality assurance, and benchmarking: comparing two frameworks for managing quality processes in open and distance learning", *The International Review of Research in Open and Distance Learning*, Vol. 6 No. 1, available at: www.irrodl.org/index.php/irrodl/article/view/221/304
- Institute for Higher Education Policy (1999), *Assuring Quality in Distance Learning: A Preliminary Review*, a report prepared for the Council for Higher Education Accreditation by The Institute for Higher Education Policy, available at: www.ihep.org/assets/files/publications/a-f/AssuringQualityDistanceLearning.pdf (accessed March 4, 2009).
- International Organization for Standardisation (2005), *ISO 9000:2005, Quality Management Systems – Fundamentals and Vocabulary*, available at: www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=42180 (accessed August 14, 2008).
- Jackson, N. (2001), "Benchmarking in UK HE: an overview", *Quality Assurance in Education*, Vol. 9 No. 4, pp. 218-35.
- Jeliazkova, M. and Westerheijden, D. (2001), "A next generation of quality assurance models: on phases, levels and circles in policy development", paper presented at The Consortium of

- Higher Education Researchers (CHER) 14th Annual Conference: Higher Education and its Clients: Institutional Responses to Changes in Demand and in Environment, Dijon, France, September 2-4, available at: www.utwente.nl/cheeps/documenten/engpap01nextgen.pdf (accessed August 14, 2008).
- Jung, I. (2004), "Quality assurance survey of mega universities", in McIntosh, C. and Varoglu, Z. (Eds), *Perspectives on Distance Education: Lifelong Learning and Distance Higher Education*, Commonwealth of Learning, Vancouver, available at: <http://unesdoc.unesco.org/images/0014/001412/141218E.pdf> (accessed March 4, 2008).
- Koul, B. and Kanwar, A. (2006), *Perspectives on Distance Education: Towards a Culture of Quality*, Commonwealth of Learning, Vancouver, available at: www.col.org/resources/publications/monographs/perspectives/Pages/2006-cultureQuality.aspx (accessed March 4, 2009).
- Newton, J. (1999), "Implementing quality assurance policy in a higher education college: exploring the tension between the views of 'managers' and 'managed'", in Fourie, M. *et al.* (Eds), *Reconstructing Quality Assurance: Programme Assessment and Accreditation*, University of the Free State Press, Bloemfontein.
- Newton, J. (2002), "From policy to reality: enhancing quality is a messy business", available at: www.heacademy.ac.uk/assets/York/documents/resources/resourcedatabase/id158_From_policy_to_reality_enhancing_quality_is_a_messy_business.rtf (accessed August 14, 2008).
- Newton, J. (2007), in Bollaert, L., Brus, S., Curvale, B.B., Harvey, L., Helle, E., Jensen, H., Komljenovic, J., Orphanides, A. and Sursock, A. (Eds), "Embedding quality culture in higher education, a selection of papers from the First European Forum For Quality Assurance, November 23-25, 2006, hosted by the Technisch Universität München, München, Germany", pp. 14-20, available at: www.eua.be/fileadmin/user_upload/files/Publications/EUA_QA_Forum_publication.pdf (accessed August 14, 2008).
- Oliver, R. and Herrington, J. (2003), "Factors influencing quality online learning experiences", in Davies, G and Stacey, E (Eds), *Quality Education at a Distance*, Kluwer Academic, London, available at: elrond.scam.ecu.edu.au/oliver/2003/qed1.pdf (accessed August 14, 2008).
- Parker, N. (2003), "The quality dilemma in online education", in Anderson, T. and Elloumi, F. (Eds), *Theory and Practice of Online Learning*, pp. 385-421, available at: cde.athabasca.ca/online_book/ch16.html (accessed August 14, 2008).
- Phillips, R. (2005), "Pedagogical, institutional and human factors influencing the widespread adoption of educational technology in higher education", in Goss, H. (Ed.), *Balance, Fidelity, Mobility? Maintaining the Momentum? Proceedings of the 22nd ASCILITE Conference. Queensland University of Technology, Brisbane, December 4-7*, available at: www.ascilite.org.au/conferences/brisbane05/blogs/proceedings/62_Phillips.pdf (accessed August 14, 2008).
- Pounder, J. (1999), "Institutional performance in higher education: is quality a relevant concept?", *Quality Assurance in Education*, Vol. 7 No. 3, pp. 156-63.
- Quality Assurance Agency for Higher Education (1999), *Guidelines on the Quality Assurance of Distance Learning*, available at: www.qaa.ac.uk/academicinfrastructure/codeOfPractice/distanceLearning/contents.asp (accessed March 4, 2009).
- Reichert, S. (2007), "Looking back – looking forward: quality assurance and the Bologna process", paper presented at The European Forum for Quality Assurance, Rome, La Sapienza, available at: www.eua.be/fileadmin/user_upload/files/QAForum_2007/PS_I_-_Reichert_-_Rome_Presentation_071115.pdf (accessed August 14, 2008).

-
- Rekkedal, T. (2006), "State of the art report on distance learning and e-learning quality for SMEs", *The EU Leonardo Project: E-learning Quality for SMEs: Guidance and Counselling*, available at: nettskolen.nki.no/in_english/elq-sme/ELQ-SMEStateofArt.pdf (accessed August 14, 2008).
- Scott, P. (1994), "Recent developments in quality assessment in GB", in Westerheijden, D., Brennan, J. and Maasen, P. (Eds), *Changing Contexts of Quality Assessment: Recent Trends in West European Higher Education*, CHEPS, Utrecht, pp. 51-75.
- Silimperi, D., Franco, L., van Zanten, T. and Macaulay, C. (2002), "A framework for institutionalizing quality assurance", *International Journal for Quality in Health Care*, Vol. 14 No. 1, pp. 67-73.
- Srikanthan, G. and Dalrymple, J. (2003), "Developing alternative perspectives for quality in higher education", *International Journal of Education Management*, Vol. 17 No. 3, pp. 126-36.
- Stensaker, B. and Harvey, L. (2006), "Old wine in new bottle? A comparison of public and private accreditation schemes in higher education", *Higher Education Policy*, Vol. 19 No. 1, pp. 65-85.
- United Nations Educational, Scientific and Cultural Organization (2005), *Guidelines for Quality Provision in Cross-border Higher Education*, available at: unesdoc.unesco.org/images/0014/001433/143349e.pdf (accessed March 4, 2009).
- van Damme, D. (2002), "Trends and models in international quality assurance and accreditation in higher education in relation to trade in education services", paper presented at The OECD/US Forum on Trade in Educational Services, Washington, DC, May 23-24, available at: www.oecd.org/dataoecd/51/29/2088479.pdf (accessed August 14, 2008).
- van der Westhuizen, L. (2007), "Challenge to apply quality assurance as a strategic tool for higher education institutions", paper presented at the Second European Quality Assurance Forum, Rome, November 15-17, available at: www.eua.be/fileadmin/user_upload/call_for_papers/the_challenge_of_applying_quality_assurance_as_a_strategic_tool.doc (accessed August 14, 2008).
- Wang, Q. (2006), "Quality assurance – best practices for assessing online programs", *International Journal on E-Learning*, Vol. 5 No. 2, pp. 265-74.
- Welsh, J. and Dey, S. (2002), "Quality measurement and quality assurance in higher education", *Quality Assurance in Education*, Vol. 10 No. 1, pp. 17-25.
- Western Cooperative for Educational Telecommunications (2002), "Best practices for electronically offered degree and certificate programs", available at: wiche.edu/attachment_library/Accrediting_BestPractices.pdf (accessed March 4, 2009).

About the author

M'hammed Abdous is a Director for the Center for Learning Technologies at Old Dominion University. His research interests include distributed learning trends, e-learning and quality assurance, process reengineering and curriculum planning and development. M'hammed Abdous can be contacted at: mabdous@odu.edu