Quality in e-learning: a framework for promoting and assuring quality in virtual institutions

D. Masoumi & B. Lindström

Department of Education, Communication and Learning, University of Gothenburg, Gothenburg, Sweden

Abstract

With the growing demand for e-learning along with striving for excellence associated with globalization, there are worldwide calls for enhancing and assuring quality in e-learning, specifically in the context of the developing countries. Such calls for quality enhancement, accountability, added value, value for money, self-evaluation, and role players' satisfaction in higher education settings cannot go unheeded. Addressing the concerns regarding enhancing and assuring quality in e-learning, a comprehensive e-quality framework is developed by taking into account the pros and cons of the previous models, frameworks, and studies of e-quality. This e-quality framework offers a structured set of factors and benchmarks as a tool for practical quality work with e-learning in virtual institutions.

Keywords

developing countries, e-learning, e-quality framework/models, quality, virtual institution.

Introduction

Higher education institutions all over the world, and not the least in developing countries, are challenged to become more competitive on a global level (cf. Inglis 2005; Oliver 2005). This can be seen as a part of a globalization process, which includes a reshaping of higher education where networked learning, e-learning, and the formation of virtual institutions are important (cf. Dirckinck-Holmfeld *et al.* 2009). The accountability movement in higher education and a number of less successful e-learning projects have amplified concerns about quality in e-learning (Connolly *et al.* 2005; Oliver 2005). Enhancing and assuring quality is critical to the success of higher education institutions involved in e-learning (Inglis 2005; Ehlers & Pawlowski 2006). For instance, McGorry (2003) asks for more attention to be paid to the quality of e-learning in higher education.

Zhao (2003) recommends that universities implement a quality assurance plan aimed specifically at e-learning programmes. Oliver (2005, p. 183), addressing these concerns in terms of 'quality agenda', states that:

> As more and more universities seek to use e-learning as a mode of delivery for their units and courses, and as more and more they are being held accountable for the quality of the services they provide, the need grows for accepted standards and benchmarks against which performance can be judged.

A substantial number of models, frameworks, and guidelines have been developed for enhancing and assuring quality in e-learning (cf. Phipps & Merisotis 2000; Watty 2003). One of the basic premises of many of these is that 'quality principles that underpin successful online teaching and learning are exactly the same as those that underpin successful face-to-face teaching' (Oliver 2003, p. 9). The basic claim of such a premise is that 'good' instructional design and 'good' educational procedure could assure the success of educational activities beyond the delivery medium. However, we

would argue that e-learning is not just a delivery medium along with other educational tools; rather, it ought to be viewed as a new approach to education, teaching, and learning. Accordingly, when addressing the quality of e-learning, it is necessary to develop methods that recognize this.

Models such as The Institute of Higher Education Policy and The Sloan Consortium Quality Framework, which have been very influential, are rooted in specific cultural norms and values. One important observation is that they are situated in a Western culture. Accordingly, the applicability of these models in other cultural contexts is put in question (cf. Fresen & Boyd 2005). In a globalized world, and with the attempt to enhance cross-cultural enterprises, e-quality models should then specifically consider cultural and cultural–pedagogical constructs (cf. Ehlers 2009).

Any framework or model for assuring and enhancing quality of education explicitly or implicitly should build on a set of theoretical premises. Otherwise, the aim of the model – what is good teaching/learning, how to improve student learning, and how and when it should be undertaken – cannot be articulated (Biggs 2001; Harvey & Newton 2004). However, in many of the contemporary e-quality models, the theoretical foundation is not articulated. It seems that some of the models are composed of an assemblage of the benchmarks, not building on a comprehensive theoretical approach. In developing e-quality framework, it is important to ensure a sound theoretical grounding.

Another problem is that many e-quality models have mechanistically approached quality in e-learning, in line with massification of education. This is often done with technocratic top-down approaches and, in terms of quality control, with roots in industrial mass production (Ehlers 2009; Masoumi & Lindström 2009). Emphasizing education as acculturation of students, rather than producing 'one-size products', it is important to develop models that also recognize the holistic character of educational processes. In many of the e-quality models, there is a tendency to focus on single aspects, thus failing to capture the holistic nature of problems and their solutions in virtual institutions. Addressing this dilemma, a systemic approach (cf. Arnseth & Ludvigsen 2006) could be argued for.

In this paper, we present a comprehensive e-quality framework for enhancing and assuring quality in virtual institutions, which attempts to answer some of the problems in many contemporary models. This framework builds on both practical and theoretical knowledge and is informed by socio-cultural thinking.

E-quality framework

The framework (see Fig 1) was developed through a comprehensive review of the practical knowledge (i.e. models, guidelines, benchmarks, etc.) used in practical quality work, as well as through examining the research on quality of e-learning and of higher education. The analysis and synthesis of the literature in the field resulted in a comprehensive e-quality framework. Using Delphi method for continuous improvement, the framework was further refined and improved as a result of critique from researchers, teachers, and other stakeholders at Gothenburg University and a number of Iranian virtual institutions. Also, the validity and usability of the e-quality framework is subject to continual review.[1] Thus, the framework needs to be upgraded and updated regularly in terms of the benchmarks and their importance.

As mentioned earlier, the e-quality framework is influenced by socio-cultural thought. This means, for example, that social aspects of learning such as *students' collaboration*, *community of practice*, and so on are taken into account. These aspects were often ignored in the e-quality work surveyed (cf. Moore 2005; Wirth 2005).

The e-quality framework is constructed with three levels in which 113 'benchmarks' are categorized and sorted into 29 'sub-factors' and seven main 'factors'/building-blocks. The benchmarks characterize and exemplify the very sub-factors and factors. These factors represent a cluster of related benchmarks that are mostly centred on a specific aspect of e-learning settings. Though, a benchmark cannot be said to exclusively refer to one factor in an educational system as all the educational components and building-blocks are integrated with each other.

Furthermore, the framework must be viewed holistically by considering all of the given benchmarks together and by their interrelationships. It needs to be mentioned that there are factors and benchmarks that go beyond e-learning – such as national and regional information and communication technology infrastructures and policies; students and teachers' information literacy; students' workload; and different role players'
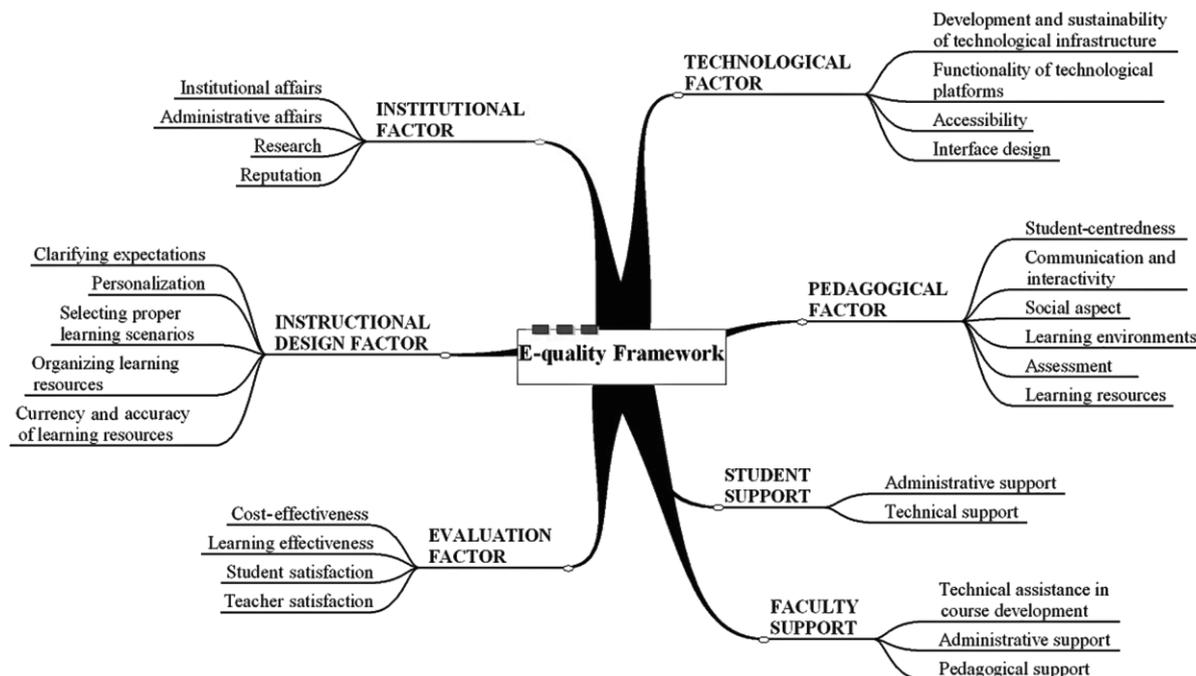
Fig 1 E-quality framework.

positive or negative attitude towards e-learning – which are not accounted for in this framework.

Reflecting a variety of perspectives, the framework attempts to cover most aspects of the quality of e-learning in virtual institutions. The framework is not centred on the organizational or methodological aspects, as is the case in most of the models provided. The practical aim is that the quality enhancement framework can be used as a tool for virtual institutions to assess and assure their practices and compare their capability to sustainably develop, deploy, and support e-learning environments with other institutions. Further, we give a more detailed outline of the framework with a brief description of factors, sub-factors, and benchmarks,[2] and with reference to the specific literature that is built upon.

Institutional factor

It is generally accepted that successful implementation of e-learning depends on explicit institutional visions and goals (long-term aims that guide current practice), along with well-established procedures and standards (Marshall 2006). Correspondingly, this factor concerns how well the virtual institutions pursue their mission and goals, and to what extent they take advantage of their diverse resources in terms of managing and organizing various recourses including physical, human resources, etc. (cf. McKinnon *et al*. 2000; Novak 2002). It should be noted that political forces usually influence the institutional issues.

Institutional affairs

Virtual institutions as learning organizations involve a 'major realignment of the institutions' organizational identity' (Marshall 2006, p. 26) that calls for intensive, strategic development activities. This sub-factor encompasses issues related to institutional and organizational affairs (i.e. institutions' structures, current and prospective constituents, academic procedures, budgeting, etc.) (Oliver 2003).

Administrative affairs

The recognition of the importance of smoothly functioning administrative (governing body) processes and good administrative support, which is accounted as an important prerequisite for establishing and maintaining high quality, is one of the key results of many years of

research on quality in educational settings (cf. McKinnon *et al.* 2000; Frydenberg 2002; Inglis 2005; Wirth 2005). This sub-factor thus refers to the efficient and effective use of the institution's diverse resources to ensure that right decisions are made and implemented competently.

Research

The interdependence of research and instruction is the foundation of higher education. Research is, accordingly, considered to be an activity along with teaching in any higher education settings (cf. Dirr 2003; Kyvik 2009). This sub-factor centres on how and to what extent the institutions' research strategies and efforts are in line with an institution's broader goals and objectives.

Reputation

A good reputation and adequate recognition of the institution among different clients and actors (e.g. prospective students, parents, employers, and local and national media) is crucial for attracting and retaining students and staff, securing endowments, attracting research funds, and marshalling community support both on a national and an international level. This could be achieved through successful implementation of the institution's mission, the quality of its pedagogical and research activities, and the quality of its community service (cf. McKinnon *et al.* 2000; Moore 2005).

Technological factor

This factor addresses technical infrastructures and assets that form the backbone of an e-learning entity. The *technological infrastructure* is viewed as the ensemble or *'web'* of equipment, techniques, and applications whose efficiency can be characterized in terms of *availability and reliability*, *the adequate functionalities, usability, and integration into the existing infrastructure*. This technological infrastructure is one of the most dynamic and rapidly changing features of e-learning environments that needs to be systematically improved and updated on a regular basis. It should be noted that the technological infrastructure includes the learning management system (LMS), learning content

management systems (LCMS), and authoring tools, although it is not restricted to these issues.

Development and sustainability of technological infrastructure

This sub-factor centres on ongoing development of technological platforms as well as on sustainability and durability of learning environments (cf. Oliver 2001; Laurillard 2002; Pat Brogan 2008).

Functionality of technological infrastructure

The e-learning infrastructure is a complex environment in which a multitude of connections and interactions is facilitated by means of highly interdependent technical elements (cf. Zhao 2003; Fresen & Boyd 2005; Wirth 2005). The functionality and reliability of this technological infrastructure, including LMSs and CMSs, is critical for attaining the success of e-learning environments.

Accessibility

Broadly speaking, accessibility usually goes beyond computers and connections. In such perspective, accessibility deals with providing the right information to the right people when they need it and in forms they can understand (cf. Inglis 2005; Moore 2005; Chua & Lam 2007; Pat Brogan 2008). It needs to be mentioned that, in a narrow spectrum, mostly in virtual institutions, accessibility refers to learning resources being accessible to all students, regardless of physical, technological, or other usage limitations.

Reusability

Reusability and the (potential of) sharing learning resources (pre-fabricated contents) and tools, which can be regarded as the key economic and efficiency advantage of e-learning, can protect the investments that have been made. Similarly, creating learning objects or modules that can be reused and restructured ensures future reusability (cf. Oliver 2001; Wirth 2005; Marshall 2006). The possible *reuse* and *modification* of learning resources and tools is dependent on the ability to store and retrieve them effectively.

Interface design

The interaction between users (students/other actors) in e-learning environments and technological platforms has been seen as a necessary and fundamental mechanism in the design and use of e-learning environments. The interface[3] between students and e-learning platform, however, is one of the most neglected aspects in these settings (Sims *et al*. 2002). Without such tools for structuring learning environments, students fail to find relevant information or are forced to devote cognitive resources to navigation rather than the content of the site (cf. Volery & Lord 2000; Cohen & Ellis 2004).

Instructional design factor

Instructional design is an iterative process that refers to the structuring and arranging of resources and procedures used to promote learning in an institution (cf. Laurillard 2002; Gagne *et al*. 2005). Quality of e-learning can be provided through constructive alignment of pedagogy, technology, and learning resources. Similarly, this factor concerns the framing of all the components of a learning environment to create successful teaching and learning environments.

Clarifying expectations

Having clearly defined learning objectives and outcomes is essential for effective teaching and student achievement. Similarly, learning goals or outcomes prefigure unity between learning activities describing the learning content, the actions to be taken or performed, and how these will be assessed (cf. Phipps & Merisotis 2000; Laurillard 2002).

Personalization

This sub-factor addresses the notion that the learning environment should be adapted to the learner's needs. Correspondingly, personalizing and customizing e-learning environments enable learners to take control of their e-learning environments in accordance with their needs, goals, knowledge, and interests (cf. Sims *et al*. 2002; Zhao 2003).

Selecting proper learning scenarios

The learning scenario, which can be considered to be a pedagogical method, can shape and influence every aspect of teaching and learning, both as a means of understanding how students learn and as tools for guiding the design and alignment of learning activities (Marshall 2006). Correspondingly, learning scenarios and styles should be selected and employed purposefully and properly based on the goals of the course, type of content, and type of audience (cf. Hosie *et al*. 2005; Holsapple & Lee-Post 2006; Huddlestone & Pike 2007).

Organizing learning resources

e-Learning is placing increased responsibility on students for achieving their goals in a given setting (cf. Husson & Waterman 2002). In such settings, in which learners are expected to work independently, finding the best way to effectively use learning resources from the inexhaustible resource mine is a big challenge for students. Thus, the learning resources should, as far as possible, be organized. The main quality issues concerning learning resources are selection and sequencing of resources, and the quality of the material used and produced in a course. Consequently, organizing and structuring learning resources can ultimately determine the effectiveness and efficiency of the learning environment (cf. Oliver 2001; Hosie *et al*. 2005; Holsapple & Lee-Post 2006; Huddlestone & Pike 2007; Swedish National Agency of Higher Education 2008).

Currency and accuracy of learning resources

This sub-factor concerns currency (i.e. up to date) and accuracy (i.e. correctness and free of error) of learning resources and materials in e-learning environments. The learning resources need to be reviewed on a regular basis to ensure currency and accuracy (cf. Oliver 2001; Zhao 2003; Hosie *et al*. 2005; Chua & Lam 2007).

Pedagogical factor

Pedagogical issues in terms of how learning scenarios and resources are creatively and constructively employed are at the core of any educational settings as in e-learning. Accordingly, the measures for this factor could be constant regardless of the context and mode of delivery (cf. Chickering & Ehrmann 1996; Volery &

Lord 2000; Marshall 2006). Having critical importance when constructing high-quality e-learning, this factor addresses the process of learning and teaching in terms of how learning and teaching is/should be carried out (i.e. communication, collaboration, and interaction).

Student-centredness

Learners' success can be significantly affected by their active engagement in vocalizing and writing about their learning, integrating past experiences, and applying them to their daily lives (Chickering & Ehrmann 1996). Similarly, a student-centred learning environment affords a supportive environment for engaging in more critical and self-directed approaches to learning by providing degrees of freedom, decision-making, reflection, and self-regulation (cf. Hosie *et al*. 2005; Holsapple & Lee-Post 2006; Marshall 2006).

Communication and interactivity

Interaction (i.e. between learners and teachers, among students, and learning environments) is at the core of learning that can create opportunities for learning and encourage dialogue between and among all the actors in an e-learning environment (cf. Chickering & Ehrmann 1996; Dillon & Greene 2003; Zhao 2003; Cohen & Ellis 2004; Wirth 2005). It should be noted that interaction between teachers and students is a vital component in e-learning settings that guides students towards successfully negotiating and exploring all paths for interactivity (Sims *et al*. 2002). As Moore and Kearsley (1996) argue, more planning is required to facilitate interaction in e-learning environments compared with campus-based learning settings.

Social aspects

Socialization and acculturation of students is one of the main, although hidden and informal, outcomes of any educational environment. Socializing and building a sense of community attract and retain learners in e-learning settings (Marshall 2006). Similarly, social presence and support of students are counted as influential factors in the success of e-learning (cf. Phipps & Merisotis 2000; Rovai 2001; Nisbet 2004; Herrington

et al. 2007). Accordingly, creating opportunities for students to collaborate and share their ideas and/or personal and professional experiences is an important design element that can strengthen students' socialization and identification.

Learning environments

Establishing and improving a sense of space and place as well as feeling at home could be an important factor in reducing the dropout rate among e-learning students. A space without any meaning to the students (i.e. without personal motivation, suitable content, or opportunities for social interaction, cultural identities, and personal involvement that are supported and embedded in the environment) is not the best place for learning. It is only a temporary space that needs to be transformed from space to place. In this transformation, social interaction in the e-learning environment is critical for enabling the users to achieve a sense of placeness in it. In other words, by shifting the design focus to *social interaction*, e-learning environments adopt environmental and social characteristics and *become more like places of learning – but still without physical restrictions* (cf. Shepherd 2003; Achtemeier & Simpson 2005; Wahlstedt *et al*. 2008).

Assessment

Impacting on the nature, effectiveness, and importance of learning activities, the assessment (type and ways of assessment) can shift and challenge learning approaches and outcomes. Similar to conventional educational settings, assessment in e-learning can be carried out in different modes by teachers and peers by means of self-assessment as well as through the students' e-portfolios (i.e. monitoring and analysing students' learning progress). Assessment in e-learning environments, however, can be challenged due to issues of security, accessibility, identification, and plagiarism (cf. Laurillard 2002; Sims *et al*. 2002; Swedish National Agency of Higher Education 2008; Wahlstedt *et al*. 2008).

Learning resources

Providing adequate learning resources and services is essential for the attainment of superior academic skills.

Institutions are expected to provide a wide range of learning resources – any entity, digital or non-digital, that can be used, re-used, or referenced during technology-supported learning – to support students' learning activities (cf. McKinnon *et al*. 2000; Phipps & Merisotis 2000; Holsapple & Lee-Post 2006).

Student support

In e-learning environments, where students learn as a result of interaction with programmed instructional systems (i.e. LMSs), all possible types of problems students are likely to face have to be predicted in advance to introduce features for performance support. In addition to typical technical support, announcements, and guidelines, more administrative and social support is required to bring the students into the e-learning environment, especially by eliminating assumptions that learners will know how and what to do. Correspondingly, the effectiveness of the support can determine the perceived quality from the learners' perspective (cf. Phipps & Merisotis 2000; Laurillard 2002). Considering the fact that many of the students who take an e-learning course/programme may never visit the off-campus and may not use campus-based student support services, providing alternative forms of student support services is critical for academic success and retaining students.

Administrative support

All educational institutions – on campus as well as off campus – need efficient and economical core student administrative services covering enquiries, admission, progression, graduation, fees, and other dues, which are oriented towards student service (Sims *et al*. 2002). Students, similarly, should be given information about the study programmes including procedures, financial issues, resources and supplies, and other necessary information (cf. Oliver 2001; Pacey & Keough 2003; Ellis & Calvo 2007).

Technical support

Technical support for students is an integral part of any successful e-learning programme. Appropriate levels of technical support or specific training to aid students in mastering the respective e-learning environ-ments should be made available as needed (cf. Phipps & Merisotis 2000; Fresen & Boyd 2005; Marshall 2006).

Teachers support

e-Learning involves a dynamic and complex information and communications environment that necessitates a range of professional support when teachers encounter issues during their work. In addition to student support, thus, teachers should be given technological and pedagogical support when developing and delivering e-learning courses/programmes (cf. Phipps & Merisotis 2000; Khan 2005; Tham & Werner 2005).

Technical assistance in course development

A lack of or insufficient technical support of teachers is one of the main obstacles to developing and running successful e-learning courses or programmes. In particular, teachers are often thrown into e-learning settings with little or no technical and professional development to assist them in adapting to the new teaching environment particularly in developing countries (Stoyanov & Kirschner 2004).

Administrative support

Much research has shown that workload as well as copyright issues have a considerable impact on teachers' motivation when moving towards innovative learning scenarios (cf. Marshall 2006). Hence, the decision-making and participatory structures should be explicitly defined, and the workload and intellectual property issues and other administrative dues should be tackled by means of appropriate guidelines and recommendations that are operational (cf. Moore 2002; Stoyanov & Kirschner 2004).

Pedagogical support

e-Learning is not just a technological add-on that teachers need to learn how to use; it is a new educational approach involving new pedagogical and professional procedures and processes that require support and professional development beyond conventional teaching forms (Marshall 2006). In the same vein, teachers' pedagogical knowledge and qualifications,

along with their specific subject knowledge, could be imperative for their success in e-learning environments (cf. Tham & Werner 2005; Wirth 2005; Ellis & Calvo 2007).

Evaluation factor

This factor, as a meta-indicator, is used to stress the ability of an institution to produce the desired result as measuring criteria for how and the extent to which it meets the demands at different levels. Similarly, performing such measures, which are closely connected to the output and outcomes of the activities, may uncover conflicting situations and areas for ongoing updating and improvement using a holistic approach.

Correspondingly, this factor centres on examining the effectiveness of the institution, programme, and course (how and to what extent learning objectives are met), as well as its cost-effectiveness from both institutional and educational perspectives. It also addresses the immediate stakeholders' satisfaction (students and teachers) with and standpoints concerning the services constructed and received.

Cost-effectiveness

Along with boosting e-learning environments, the need for explicit assessment of their cost-effectiveness becomes more obvious (particularly in terms of being sustainably funded and financially able to improve). Similarly, institutions seek to satisfactorily function within a limited timeframe, budgetary constraints, and logistical boundaries. This can help institutions to forecast their costs as well as to identify benefits in a systematic manner (Phipps & Merisotis 2000; Moore 2005).

Learning effectiveness

Learning effectiveness in terms of producing/achieving the desired result is one of the main concerns of educational institutions when it comes to satisfying students' and other gatekeepers' demands. This sub-factor addresses learning effectiveness and quality of outputs as well as outcomes of the institution (cf. Inglis 2005; Holsapple & Lee-Post 2006; Marshall 2006; Chua & Lam 2007).

Student satisfaction

As the foremost role player in educational settings, students are able to provide reliable feedback on the quality and effectiveness of their academic experience, both directly and indirectly. Acknowledging students' feedback and perceptions regarding their learning experiences can be an effective way for institutions' ongoing improvement (cf. Phipps & Merisotis 2000; Zhao 2003; Moore 2005). Similarly, this sub-factor concerns students' standpoints and satisfaction[4] with regard to their educational experiences.

Teachers' satisfaction

Although e-learning can provide a variety of potential advantages (i.e. anytime, anywhere, and any-pace learning), the utilization of these possibilities, however, can be substantiated by teachers' supportive and reliable presence. Teachers' satisfaction and motivation are seen as important success indicators and can thus influence the quality of e-learning (cf. Zhao 2003; Moore 2005; Marshall 2006).

Concluding remarks

The e-quality framework presented is a response to the concerns and calls about quality in e-learning in general, and in virtual institutions in particular. With the aim of providing a tool for formative quality work, as well as promoting a culture of ongoing self-improvement, we have made an attempt to synthesize theoretical and practical knowledge in the area of quality in e-learning.

The e-quality framework has two primary functions: quality enhancement and quality assurance. In terms of quality enhancement, it is explicitly designed to foster quality improvement in virtual institutions. Using this e-quality framework in virtual institutions can offer institutions the capacity to enhance and assure quality. Further, the framework can provide a basis for determining the minimum requirements for institutions to be viable when providing a virtual programme or course. Similarly, the 'health' of an institution/programme can be examined. Moreover, the framework can enable virtual institutions to identify what they should measure and how to measure it to determine their strengths and

weaknesses and plan for improvement. In addition to its quality enhancement imperative, the framework sets out to assure the quality of e-learning against predetermined criteria and benchmark.

On a practical level, introducing the framework for the principal role players in virtual institutions – particularly students, teachers, and decision-makers – can enhance the quality of educational settings by raising their awareness, changing their attitudes, and broadening their expectations.

The framework can also be used as foundation for developing a national framework for assuring and enhancing quality in virtual institutions. This should be of specific value to developing countries. Furthermore, the framework can be used in part to enhance and assure quality in e-learning at the micro-level in terms of a programme, course, or module, as well as meso- and macro-levels.

It is important that a framework for enhancing and assuring quality in e-learning recognize cultural and cultural–pedagogical norms and values. Socio-cultural theories offer a basis for this, based on the premise that education fundamentally is a social and cultural enterprise. As noted earlier, however, a majority of models developed for qualifying and assuring public services in general, and higher education in particular, have been developed and shaped on the basis of Western cultural premises. Not recognizing cultural differences and diversity – on the level of institutions as well as groups and individuals – can be detrimental both to the quality of e-learning per se and to quality work as an instrument for enhancement of e-learning. An e-quality framework – based on the models and frameworks grounded in Western cultural premises – needs to be culturally enhanced[5] to be adaptable to different cultural contexts and productively used in, for example, developing countries. In a broader perspective, this is crucial to a globalization process where cultural diversity is taken as an asset.

Notes

[1]A validation of the framework is partly done in Masoumi (2010).

[2]Refer to Masoumi (2010) for a complete review of the benchmarks.

[3]The visible part of information system that a user sees, hears, or touches.

[4]Student's perception pertaining to the college experience and perceived value of the education received while attending an educational institution (Moore 2005).

[5]A conceptual model, that is, a *culture-sensitive e-quality model* is introduced in Masoumi (2010) to exemplify how the cultural and cultural–pedagogical constructs can be built in and taken to account when developing and implementing an e-quality framework.

Appendix. An outline of the given benchmarks

1-1 *(1)* The institutions should have a documented strategic plan addressing the following aspects:
   – Mission, goals, and objectives of the institution;
   – Sustainability and expansion of its educational activities;
   – Improving and assuring quality of pedagogical activities; and
   – Relating and utilizing e-learning activities (programmes, courses) to other educational activities (in dual-mode institutions).
 (2) There should be a documented institutional technology *plan* that clearly describes the procedures for acquiring, deploying, supporting, maintaining, and upgrading hardware and software in e-learning.
 (3) Institutional criteria should be defined for budgeting with a diversified source of funding and prioritizing the allocation of resources.
 (4) Strategies and goals should be regularly analysed to meet the increasing velocity of change according to societal and market expectations (e.g. by systematic reviewing, and modifying plans and strategies).
 (5) The institution's rules, regulations, staff roles and responsibilities, and its operations should be documented and made transparent (e.g. entrance and admission, examination procedures, tuition fees, etc.).
 (6) The institution's human resource policies and practices (e.g. recruitment, retention, promotion, etc.) should be documented and linked to its strategic plan.
 (7) The institution should document on which premises the students should be participating in its educational activities such as e-literacy, access to technology, and so on.

1-2 *(1)* Systematic activities should be designed and implemented to exploit the diverse resources of the institution to acquire the best products (in teaching, research, and consultancy).

(2) A risk assessment (apart from financial and operational efficiencies) is regularly undertaken to update the risk profile of the institution and assess whether any different action is required to manage risks better.

(3) Students should be formally involved and should participate in decision-making with respect to institutional strategies and associated operational issues (e.g. by means of a flat organizational structure).

(4) Teachers should be formally involved and participate in decision-making with respect to institutional strategies and associated operational issues.

(5) Decision-makers need to be confident that they can maintain their positions and assigned duties for a definite period of time and that their positions would not be affected by political vagaries.

(6) The administrative procedures, including negotiations, decisions, financial issues, etc., should be transparent.

(7) A systematic approach should be designed and implemented to provide an appropriate institutional climate (e.g. degree to which staff feel they are valued, encouraged to take initiatives, and have the opportunity to realize their own career goals, etc.).

1-3 *(1)* Institutions' research strategies should be defined in ways that achieve the desired outcomes.

(2) Educational activities should be based on and linked to research activities that address following aspects:
– Proportion of academic staff in more senior teaching/research positions (e.g. staff with PhD degrees, professorships); and
– The degree of teachers' engagement in research activities.

(3) Research outcomes should be measured and developed on a regular basis (e.g. number of national or international grants received, funds for research from industry, publications with high impact, etc.).

(4) Research activities should be interlinked with institution's developmental processes (e.g. assessment, supervision of thesis work, etc.).

1-4 *(1)* The institution's academic reputation should be measured and enhanced in terms of:
– Graduates/alumni evaluations;
– Industry and employer views;
– Crisis response capability; and
– Extent and ratio of positive/negative media broadcasting.

(2) Competitiveness of the institution when it comes to attracting students should be measured and improved (e.g. students' first choices, proportion of top 5% of applicants and median entry scores over time).

(3) Institutions should develop a formal strategy of community service (e.g. sharing facilities with local and other groups) as a means of enhancing their external impact.

2-1 *(1)* E-learning platforms should be regularly analysed to seek out and adjust to upcoming challenges and changing expectations.

(2) The capability of adding new functionality or features (*Extendibility*) should be given to existing platform (LMS).

(3) There should be a documented specification and plan that ensures the reliability, integrity, and validity of information collection, storage, and retrieval.

(4) Students' feedback should be collected and considered in terms of the ease of use, effectiveness, robustness, and reliability of the e-learning infrastructure on a regular basis.

(5) Maintaining of produced, delivered, and collected information including content and data produced should be granted (e.g. constructed discussions and student records).

2-2 *(1)* A standardized (common) set of tools, including *tracking facilities*[1], instant messaging, forums, etc., should be put in place and used.

(2) The functionality of the technological platform should be regularly appraised.

(3) The reliability of the e-learning system should be as fail-safe as possible (a high degree of fail-safe such as back-up of the 'virtual settings' in the event of a catastrophic failure).

(4) *Security* and *Privacy* of delivered, collected, and stored information in e-learning settings should be granted.

(5) There should be a satisfactory reaction time in the event of malfunction.

2-3 *(1)* Learning materials should be reasonably and adequately accessible to students whenever they want.

(2) Access to learning materials should be granted to learners with disabilities (e.g. 'screen readers' for those with limited vision, 'text narration' for persons with limited or no hearing abilities, etc.).

(3) The e-learning platform should satisfy appropriate bandwidth demands (e.g. materials are accessible without lengthy delays).

2-4 *(1)* Institutional strategies, policies, contracts, and standards should support and encourage the reuse of e-learning materials (e.g. utilizing the metadata templates and standards such as SCORM, LOM, etc.).

(2) Special settings for reusability (*Interoperability*) within and across institutions should be decided on (e.g. adapting and replacing objects throughout the systems without writing additional code).

(3) (Re)development of the e-learning design and tools should be considered before a new platform or resources are created.

(4) Teachers should be provided with training, guidelines, and examples for creating and adapting reusable resources.

2-5 *(1)* The e-learning platform should provide students with a user-friendly environment, self-evident and predictable pathways that help them perform learning activities smoothly and effectively by:
  – Developing a user-friendly e-learning environment;
  – Cognitive load through the appropriate use of colour and layout;
  – Assisting users visually by the appropriate use of text, images, audio, video, animation, graphics, etc.;
  – Standardized navigation (i.e. fully connected network) in which users can find their way with a minimum of clicks; and
  – Providing well-programmed search options.
  (2) The e-learning platform should give students a high degree of control and speed in their personal management tasks such as email, address books, calendars.
  (3) Information should be 'chunked' effectively to allow for easy scanning.
3-1 *(1)* Objectives and goals of instructional units should be clearly stated.
  (2) A clear and complete course overview and syllabus should be provided.
  (3) The instructional format/methods and the expected level of participation should be explicitly stated (i.e. course workload expectations).
  (4) Course outlines should provide information about the type of interaction and expected times to get feedback in different communication channels.
  (5) Learning objectives should be linked explicitly throughout learning and assessment activities (e.g. criteria for assessment and examination).
3-2 *(1)* In the design and use of e-learning settings, students' needs, skills, and knowledge should be addressed and supported to meet their individual needs or preferences.
  (2) Various didactic scenarios to support diverse learning styles and learner capabilities should be provided.
  (3) Full portfolio capability should be granted, enabling students to take artefacts from each of the courses and keep them in their own personal space (e.g. materials, tasks, etc).
  (4) Students should have opportunities to manage and modify their learning environments in terms of content structure, layout, colour, information, etc.
3-3 *(1)* Learning scenarios should be appropriate for the intended purpose, type of content, and students' needs.
  (2) Learning media and tools should be selected according to objective, content, and students' preference along with selected learning scenarios.
  (3) Effective learning strategies (e.g. team problem-solving) that actively engage students in the learning process should be underlined in designing and delivering e-learning courses.
3-4 *(1)* Developed learning resources (content and materials) should be appropriate for the specified course.
  (2) Sequencing and/or hierarchical structuring of learning resources should be granted in a way that best supports learners needs (coherent, time).
  (3) Learning resources/course content should be comparable in rigour, depth, and breadth with traditionally delivered courses (e.g. course elements acquired or licensed from conventional universities).
3-5 *(1)* The learning resources should be accurate and reliable.
  (2) Learning resources should be reviewed and updated on a regular basis (internal evaluation and subsequent improvement).
  (3) Course ownership and copyright status in the design and (re)developing a course should be clearly defined.
4-1 *(1)* Developed e-learning environments should facilitate and motivate students to play an active role in gaining new competencies and constructing their knowledge.
  (2) Learning activities should encourage analysis and develop learners' capabilities (e.g. intellectual) rather than recalling and acquiring knowledge as follows:
  – Develop students' reflective thinking and meta-cognitive skills;
  – Provide opportunities to describe and reflect on their own learning;
  – Integrate previous experience and knowledge into course activities and tasks;
  – Provide degrees of freedom, decision-making reflection, and self-regulation.
  (3) Students should be engaged in authentic learning activities and tasks (i.e. discussion and assignments relating to real life experiences).
  (4) Assessment tasks and learning activities should be designed to build and develop student engagement.
4-2 *(1)* Multiple communication channels should be defined for establishing and facilitating students' interactions[2] with teachers and other students.
  (2) Constructive feedback (in terms of reinforcing learning, being authentic, correcting errors, and supplying information in context) should be provided in a timely manner.
  (3) A variety of communication channels should be used to provide in-depth and contextual feedback.
  (4) Opportunities to interact privately (e.g. virtual 'office hours') with teachers should be granted when requested.
  (5) Lecturers and students should be known to each other (e.g. by means of a bio, personal web page, e-mail message, photos, etc).

4-3 *(1)* Students should be encouraged and given opportunities to participate in *on/offline* communities (e.g. via threaded discussions forums, cyber cafés, chat rooms and various e-mail services, students' hyperlinks, and be able to see other students' status who is online, etc.).

    (2) Productive and constructive exchanges of views (e.g. buddy systems) as well as an atmosphere of mutual respect should be fostered.

    (3) Collaboration among students to create products that could not be produced individually should be encouraged (e.g. peer tutoring, peer feedback, and group learning).

    (4) Various tasks and assignments that require students to collaborate meaningfully should be emphasized.

    (5) Utilizing and participating in interactive tools such as Web 2.0 (e.g. blogs, wikis, etc.) should be encouraged.

4-4 *(1)* All higher education institutions' spaces, including offices, libraries, information computer laboratories, etc., should be mapped (linked) in virtual environments.

    (2) Learners should become inhabitants of the e-learning place, feeling comfortable and having support for their interpretations of a place (the transitions from space to place in a way that makes students feel at home).

    (3) E-learning environment should offer different types of opportunities for private and public interaction.

4-5 (1) Assessment of students' achievements should span the whole lifecycle of the course/programme.

    (2) Assessment of students' achievements should be fair, flexible, and pedagogically justified.

    (3) The validity and reliability of assessments should be regularly monitored and amended in response to collected feedback (e.g. criteria should reflect the aims and objectives of the course and be made known to students).

    (4) Utilizing a range of assessment formats (regarding the type of learning activities) along with implementing policies for dealing with plagiarism should be considered.

    (5) Assessment of students should be designed to progressively build up their competence including their critical thinking.

    (6) Students should be provided with details of the workload and specified timetables (deadlines) for key learning activities.

4-6 *(1)* Full range of learning resources and services should be available for students (e.g. through an institutional library) including web access to databases and other on or offline resources.

    – Students should be given clear information on how to access the full range of library services.

    – Standard templates for library resource pages listing useful databases, journals, etc. are provided and supported by designated course or discipline librarians.

    (2) Learning resources and information services should be easily accessible when dealing with any of the delivered courses.

    (3) Development of students' research and information literacy skills should be explicitly supported (e.g. how and where to find reliable and valid resources).

    (4) Facilities and opportunities for downloading and printing learning materials should be supported (when necessary).

5-1 *(1)* Instructions and guidelines describing e-learning technologies and pedagogies should be defined, including plagiarism, academic procedures, access to counselling, and advisory services, etc.

    (2) Enquiries and questions directed to student service should be answered quickly (i.e. within a time frame) and accurately (e.g. acknowledgement of payment of fees, billing, etc.).

    (3) A structured system should be in place to address students' complaints using a variety of alternative communication channels consistent with the course as a whole.

    (4) A counselling service for students' academic and personal issues should be available.

    (5) A number of training courses should be available to empower students to maximize their mastery of learning environments.

5-2 *(1)* Just-in-time, just-enough, and at-the point-of-need technical assistance should be available throughout the duration of the course/programme.

    (2) Clear and consistent instructions about the type and extent of student technical support should be outlined.

    (3) A high-quality 'helpdesk' with trained site facilitators/coordinators should be available throughout the duration of the course/programme for students who need assistance.

6-1 *(1)* Teaching staff should be provided with design and development support, such as templates, examples, etc., particularly in transition from a conventional system to an e-learning environment.

    (2) Course design, development, and delivery should be guided and informed by formally developed e-learning procedures and standards.

    (3) Teachers should be provided with hands-on assistances in running e-learning courses (e.g. in dealing with student-related technical issues).

6-2 *(1)* Issues related to workload, compensation, ownership of intellectual property, etc. should be clarified.

    (2) Incentives for the staff involved in the design and running of the courses, particularly for those who create resources that can be effectively reused, should be considered.

6-3 *(1)* Pedagogical assistance should be provided to teachers in designing and (re)developing courses (e.g. by providing templates, examples).

(2) Teaching staff should have access to pedagogical support when running and teaching online courses.

(3) Teachers should be provided with hands-on training in order to master an e-learning platform. Alongside of this, new technologies may have important educational advantages, but without support and ongoing training for staff and students, they could prove an expensive disaster.

(4) Appropriate professional development opportunities for teachers should be provided on a regular basis along with staff development strategies in terms of:
– Updating of teachers' technical knowledge and skills to empower with tools; and
– Improving their pedagogical knowledge and skills to enable them to carry out their educational roles properly.

7-1 *(1)* Cost-effective (benefit) analyses should be carried out on a regular basis in terms of:
– Course completion rates;
– Enrolment rate;
– Retention, particularly from first to second year;
– Number of students in a course; and
– Number of teaching hours per student (instructor-led interaction).

(2) Tuition rates should provide a fair return for the institution and, at the same time, best value for learners (i.e. less than or equivalent to on-campus tuition).

(3) Institutions should look for ways of improving its services while reducing costs (e.g. by forming appropriate partnerships).

7-2 *(1)* Intended learning outcomes should be regularly reviewed to ensure appropriateness, utility, and use with respect to ongoing enhancement of e-learning initiatives.

(2) High quality of learning outputs and outcomes should be regularly examined in terms of:
– Outcomes achieved by students (i.e. skills and competence), which should be comparable to on-campus institutions outcomes;
– The proportion of employed, unemployed (graduate students), and those enrolled in further studies; and
– Students' (graduates) competence from employer perspectives.

(3) Effectiveness of learning activities should be regularly assessed for a specific course/programme.

7-3 *(1)* Students' feedback and perceptions regarding their learning experiences should be collected and taken into account on a regular basis in terms of:
– Level of interaction with faculty and other students;
– Timely and constructive feedback from teachers;
– Learning outcomes, matching the course description;
– Adequacy and appropriateness of technical and pedagogical support; and
– Satisfaction with services (advice, registration, access to materials).

(2) Students' feedback should be collected and considered regularly as regards the quality and effectiveness of their e-learning experience.

7-4 *(1)* Teachers' satisfaction and standpoints regarding their educational experiences should be collected and taken into account on a regular basis in terms of:
– Confirmation of initial expectations;
– Administrative affairs;
– Expected technical and pedagogical support;
– Ownership of intellectual property; and
– Staff training and development.

(2) Teachers' feedback should be collected and considered regularly as regards the quality and effectiveness of their e-learning experience.

---

[1]Virtual attendance record.

[2]Synchronous interaction (such as chat, shared whiteboards, audio or video conferences, discussion forums, etc.) and asynchronous interaction (such as emails, threaded discussions, announcements and messaging, bulletin boards, discussion forums, listservs, groupware, and document sharing).

References

Achtemeier S.D. & Simpson R.D. (2005) Practical considerations when using benchmarking for accountability in higher education. *Innovative Higher Education* **2**, 117–128.

Arnseth H.C. & Ludvigsen S. (2006) Approaching institutional contexts: systemic versus dialogical research in CSCL. *International Journal of Computer-Supported Collaborative Learning* **1**, 167–185.

Biggs J. (2001) The reflective institution: assuring and enhancing the quality of teaching and learning. *Higher Education* **41**, 221–238.

Chickering A.W. & Ehrmann S.C. (1996) *Implementing the seven principles: technology as a lever*. Available at: http://

www.tltgroup.org/programs/seven.html (last accessed 20 April 2006).

Chua A. & Lam W. (2007) Quality assurance in online education: the Universitas 21Global approach. *British Journal of Educational Technology* **38**, 133–152.

Cohen M.S. & Ellis T.J. (2004) *Validating a criteria set for an online learning environment*. Paper presented at the Frontiers in Education Conference. Savannah, GA.

Connolly M., Jones N. & O'Shea J. (2005) Quality assurance and e-learning: reflections from the front line. *Quality in Higher Education* **11**, 59–67.

Dillon C. & Greene B. (2003) Learner differences in distance learning: finding differences that matter. In *Handbook of Distance Education* (eds M.G. Moore & W.G. Anderson), pp. 235–244. Lawrence Erlbaum Associates, Mahwah, NJ.

Dirckinck-Holmfeld L., Jones C. & Lindström B., eds (2009) *Analysing Networked Learning Practices in Higher Education and Continuing Professional Development*. (Technology Enhanced Learning Vol. 4). Sense Publishers, Rotterdam, The Netherlands.

Dirr P.J. (2003) Distance education policy issues: towards 2010. In *Handbook of Distance Education* (eds M.G. Moore & W. Anderson), pp. 461–480. Lawrence Erlbaum Associates, Mahwah, NJ.

Ehlers U.-D. (2009) Understanding quality culture. *Quality Assurance in Education* **17**, 343–363.

Ehlers U.-D. & Pawlowski J.M. (2006) Quality in European e-learning: an introduction. In *Handbook on Quality and Standardisation in E-Learning* (eds U.-D. Ehlers & J. Pawlowski), pp. 1–13. Springer, Berlin.

Ellis R.A. & Calvo R.A. (2007) Minimum indicators to assure quality of LMS-supported blended learning. *Educational Technology & Society* **10**, 60–70.

Fresen J.W. & Boyd L.G. (2005) Caught in the web of quality. *International Journal of Educational Development* **25**, 317–331.

Frydenberg J. (2002) *Quality standards in eLearning: a matrix of analysis. International Review of Research in Open and Distance Learning*. Available at: http://www.irrodl.org/index.php/irrodl/article/view/109/189 (last accessed 26 February 2008).

Gagne R.M., Wager W.W., Goals K.C. & Keller J.M. (2005) *Principles of Instructional Design*. Wadsworth, Belmont, CA.

Harvey L. & Newton J. (2004) Transforming quality evaluation. *Quality in Higher Education* **10**, 149–165.

Herrington J., Oliver R. & Herrington A. (2007) Authentic learning on the web: guidelines for course design. In *Flexible Learning in An Information Society* (ed. B.H. Khan), pp. 26–35. Information Science Pub, Hershey, PA.

Holsapple C.W. & Lee-Post A. (2006) Defining, assessing, and promoting e-learning success: an information systems perspective. *Decision Sciences Journal of Innovative Education* **4**, 67–85.

Hosie P., Schibeci R. & Backhaus A. (2005) A framework and checklists for evaluating online learning in higher education. *Assessment & Evaluation in Higher Education* **30**, 539–553.

Huddlestone J. & Pike J. (2007) Seven key decision factors for selecting e-learning. *Cognition, Technology & Work* **10**, 237–247.

Husson W.J. & Waterman E.K. (2002) Quality measures in distance learning. *Higher Education in Europe* **27**, 253–260.

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*. Available at: http://www.microsoft.com/isapi/redir.dll?prd=ie&pver=6&ar=CLinks (last accessed 29 March 2009).

Khan B.H. (2005) *E-Learning Quick Checklist*. Information Science Pub, Hershey, PA.

Kyvik S. (2009) *The Dynamics of Change in Higher Education Vol. 27*. Springer, Oslo.

Laurillard D. (2002) *Rethinking University Teaching: A Conversational Framework for the Effective Use of Learning Technologies*. Routledge, London.

Marshall S. (2006) MM version two process assessment workbook. Report to the New Zealand Ministry of Education. Victoria University of Wellington, Wellington.

Masoumi D. (2010) *Quality in E-Learning Within a Cultural Context: The Case of Iran*. Acta Universitatis Gothoburgensis, Göteborg, Sweden.

Masoumi D. & Lindström B. (2009) Foundations of cultural design in e-learning. *International Journal of Internet and Enterprise Management* **6**, 124–142.

McGorry S.Y. (2003) Measuring quality in online programs. *The Internet and Higher Education* **6**, 159–177.

McKinnon K.R., Walker S.H. & Davis D. (2000) *Benchmarking: A Manual for Australian Universities*. Dept. of Education, Training and Youth Affairs, Higher Education Division, Canberra.

Moore J.C. (2002) *Elements of Quality: The Sloan-CTM Framework*. Sloan Center for OnLine Education, Needham, MA.

Moore J.C. (2005) *The Sloan Consortium quality framework and the five pillars*. Available at: http://www.sloan-c.org/index.asp (last accessed 13 February 2007).

Moore M.G. & Kearsley G. (1996) *Distance Education: A Systems View*. Wadsworth Pub. Co, Belmont, CA.

Nisbet D. (2004) Measuring the quantity and quality of online discussion group interaction. *Journal of eLiteracy* **1**, 122–139.

Novak R.J. (2002) Benchmarking distance education. *New Directions for Higher Education* **118**, 79–92.

Oliver R. (2001) *Strategies for assuring the quality of online learning in Australian higher education*. Paper presented at the Proceedings of Moving Online II Conference. Southern Cross University, Lismore.

Oliver R. (2003) *Exploring benchmarks and standards for assuring quality online teaching and learning in higher education*. Paper presented at the Proceedings of 16th Open and Distance Learning. Association of Australia Biennial Forum, Canberra. Available at: http://elrond.scam.ecu.edu.au/oliver/2003/odlaa.pdf (last accessed 8 February 2008).

Oliver R. (2005) Quality assurance and e-learning: blue skies and pragmatism. *Research in Learning Technology* **13**, 173–187.

Pacey L. & Keough E. (2003) Public policy, institutional structures, and strategic implementation. In *Handbook of Distance Education* (eds M.G. Moore & W. Anderson), pp. 171–184. Lawrence Erlbaum Associates, Mahwah, NJ.

Pat Brogan A. (2008) E-learning standards: a framework for enabling the creation and distribution of high-quality, cost-effective web-delivered instruction. In *The E-Learning Handbook: Past Promises, Present Challenges* (eds S. Carliner & P. Shank), pp. 167–214. Pfeiffer, San Francisco, CA.

Phipps R. & Merisotis J. (2000) *Quality on the Line: Benchmarks for Success in Internet-Based Distance Education*. The Institute of Higher Education Policy, Washington, DC.

Rovai A.P. (2001) Classroom community at a distance: a comparative analysis of two ALN-based university programs. *Internet and Higher Education* **4**, 105–118.

Shepherd C. (2003) *E-Learning's Greatest Hits*. Above and Beyond Ltd, Brighton, UK.

Sims R., Dobbs G. & Hand T. (2002) Enhancing quality in online learning: scaffolding planning and design through proactive evaluation. *Distance Education* **23**, 135–148.

Stoyanov S. & Kirschner P. (2004) Expert concept mapping method for defining the characteristics of adaptive e-learning: ALFANET project case. *Educational Technology Research and Development* **52**, 41–56.

Swedish National Agency of Higher Education (2008) *E-Learning Quality: Aspects and Criteria for Evaluation of E-Learning in Higher Education*. Swedish National Agency for Higher Education, Stockholm.

Tham C.M. & Werner J.M. (2005) Designing and evaluating e-learning in higher education: a review and recommendations. *Journal of Leadership & Organizational Studies* **11**, 15–25.

Volery T. & Lord D. (2000) Critical success factors in online education. *The International Journal of Educational Management* **14**, 216–223.

Wahlstedt A., Pekkola S. & Niemelä M. (2008) From e-learning space to e-learning place. *British Journal of Educational Technology* **39**, 1020–1030.

Watty K. (2003) When will academics learn about quality? *Quality in Higher Education* **9**, 213–221.

Wirth M.A. (2005) *EFMD certification of e-learning (CEL)*. Available at: http://www.efmd.org/attachments/tmpl_1_art_051114rojt_att_051114czte.pdf (last accessed 27 February 2007).

Zhao F. (2003) Enhancing the quality of online higher education through measurement. *Quality Assurance in Education* **11**, 214–221.