Vol.1 No.3 July, 2013 ISSN : 2320 –2653

E-Learning Quality (ELQ) Policy

Dr.N.Subburaj

Principal, Padmavani Arts & Science College for Women, Salem-11

S.Govindaraj

Asst. Professor in BBA, SLS, MAVMM, Ayira Vaisayar College, Madurai

Introduction

Based on an analysis of European policies and projects, practices from national organisations presented in the preceding chapters, and on an analysis of current research on quality in e-learning, we have developed a model – ELQ (e-learning quality) – that contains aspects and criteria for quality assessment of e-learning in higher education.

ELQ – a model for quality assessment of e-learning

ELQ is made up of ten quality aspects which we consider crucial when assessing quality in e-learning:

1. Material/content
2. Structure/virtual environment
3. Communication, cooperation and interactivity
4. Student assessment
5. Flexibility and adaptability
6. Support (student and staff)
7. Staff qualifications and experience
8. Vision and institutional leadership
9. Resource allocation
10. The holistic and process aspect

The above aspects are not numbered in order of importance, but there is a rough sequence from the smallest elements of teaching/learning processes to an organizational, systemic and holistic view. This in fact also reflects the two different and complementary sources of information we have used in this study: those with an organizational perspective and those with a research perspective. The research articles mostly deal with the first categories in our model,

particularly learning material, virtual environment, interaction between teachers and learners and student assessment (exemplified in Table 1).

Table 1. Quality aspects discussed in the 20 most recent articles (2007) in the International Review of Research in Open and Distance Learning (IRRODL) and the 13 most recent articles (2007-2006) in the European Journal of Open and Distance Learning (EURODL),60 One article often discusses more than one aspect.

IRRODL		EURODL	Total
1. Material/content	6	6	12
2. Structure/virtual environment	16	9	25
3. Communication, cooperation and interactivity	10	6	16
4. Student assessment	5	5	10
5. Flexibility and adaptability	14	0	14
6. Support (student and staff)	2	2	4
7. Staff qualifications and experience	1	1	2
8. Vision and institutional leadership	6	0	6
9. Resource allocation	3	0	3
10. The holistic and process aspect	0	1	1

On the other hand, the benchmarking and quality aspects formulated by national agencies and organisations have a strong focus on the later categories, such as leadership, support organisation, assessment, staff qualification and experience, resource allocation and degree of flexibility. We believe that a combination of all these aspects is needed – and not only as the sum of the different parts, but aligned in a functional manner that adopts a systemic view. It is important for all elements to fit together in a coherent manner on the basis of a pedagogical philosophy.

The quality aspects are thematic areas, each with a set of specific e-learning problems and issues. For each quality aspect, 3–4*quality criteria* have been developed. These criteria are recommendations for concrete measures for dealing with the problems and issues identified at an institutional level.

Quality aspects and criteria

1. Material/content

The amount of available and continuously produced course content for e-learning is enormous. The main quality issues that concern material and content are selection and sequencing of material, and the quality of the material used and produced on a course. In e-learning, course content is moving far beyond the

printed book to an interactive multimedia environment, which blurs the distinctions between content, virtual environment and teaching, and between learning and interaction.

For several centuries, basic course content in education has consisted of printed books. In e-learning, the printed book is still relevant, but course content in the digital world is much more varied. In fact, even the old media is now being produced with the use of new media: today practically all printed books are digitally produced. This means that the printed book will exist alongside a digital book, with all the features characteristic of digital media, making it fundamentally different. Software can read the text aloud to the learner via a computer or smart phone. Other transformations of the text include additional illustrations or multimedia, provided by the teacher, student or anyone online

Freely available course content is produced by organisations and institutions61such as UNESCO62, the Open University UK63and the Massachusetts Institute of Technology (MIT)64. The combination of freely available learning content and the development of standards have great potential for enabling vast financial savings and quality improvements.

Intellectual property rights (IPR) are another major concern when production is spread out and sometimes collaborative. The main challenge of IPR is not in the complexity of the media; it is in the complexity of the production process.

2. Structure/virtual environment

Pedagogically useful features of a virtual environment include easy and structured ways of finding information and of communicating with peers and teachers. The technical infrastructure must be robust, reliable, accessible and user-friendly.

Today the virtual learning environment for each individual e-learner consists of a large number of tools, from search engines, Internet voice communication, instant messaging, chat groups, e-mail, RSS feeds,66 and blogs, to social networking programs, online web/videoconferencing systems, e-portfolio programs, and social operating systems 67 In short, skilled users apply a mixture of programs in the virtual world to solve tasks and problems, and the use of these tools68 involves informal as well as formal learning. Social technology is widely used, enabling collaboration and enhancement of social presence.

The rate at which new programs are created and others become obsolete is very high. For example, early e-learning platforms – implemented to facilitate e-learning by grouping course material, course management and asynchronous text-based communication during the course within one structure – were based on administrative management systems developed for business purposes.

Virtual learning environments are also developing as a spin-off of the digital game industry, which adopt a different strategy for interacting online. The game-based learning environments are audiovisual and three-dimensional, and they emphasize social presence and synchronous communication. Second Life70, for example, is used for teaching mathematics and languages. Real-life situations and problems are mimicked and experiential learning "doing things" supports teamwork, discussions and problem-solving activities.

With new and evolving learning environments that are supported by virtual, sometimes free and open communities, and commercially available virtual worlds, it is not easy for institutions to maintain control over quality.

3. Communication, cooperation and interactivity

Communication, cooperation and interaction are at the core of learning. One main difference compared to campus-based learning is that more planning is required to facilitate communication in e-learning (Moore and Kearsley 2005). The communication structure chosen for a particular e-learning course depends on the available infrastructure, level of teacher and student proficiency and the objectives of the course. Collaboration, for example, is fostered in online gaming, blogs and wikis. Such collaboration can extend to open online communities or be protected and only accessible to the student on the actual course. For specific tasks, a closed environment may be the best choice, whereas open environments add new dimensions and possibilities for discussions. The digital world is not restricted by physical borders. There are great opportunities for international sharing and cooperation in the development and provisions of e-learning.

Communication, as part of an e-learning course, can, moreover, be organised within four dimensions of time and space (Table 2). Many e-learning courses rely mainly on asynchronous communication, since one of the strongest incentives for students to choose e-learning is that they will have greater control over pace (Tallent-Runnels 2006).

Table 2 Information and communication technology related to time and place in e-learning

	Same place	Different place
Same time	**Technology-supported teaching** - Demonstration programs - Visual presentation programs	**Synchronous communication** - Video conference - Chat/Instant messaging - IP telephone - Whiteboard - Audio chat
Different time	**Technology-supported learning** - Self-studies (Simulations, Animations etc…)	**Asynchronous communication** - E-mail - E-forum - Audio forum - Online video lectures - Text messaging

Different approaches to designing communication in e-learning courses can be identified. Some of them focus on dialogue between teachers and learners, which requires technology that enhances and enriches the communication channels. In theses approaches, communication needs to be organised according to a communication contract that regulates teachers' working hours, use of communication channels, response time and support. Other e-learning methods focus on pre-fabricated content and interactive learning activities, where interactivity and learning take place without teacher guidance. Intermediate models combine these two approaches in various ways.

4. Student assessment

There is no fundamental difference between student assessment online or face to face. Students tend to respond first to assessment requirements, so learning innovation has to include innovation/alignment of assessment.

Online assessment basically implies an opportunity for increased variation in methods of group dynamics, time and place. E-learning adds possibilities for diversifying assessment methods, including simulations, virtual seminars and asynchronous group work. This entails a radical change in how learning processes are designed and hence in how student assessment is performed.

Online assessment also adds challenges due to issues of security, accessibility and identification (Clarke et al. 2004, Rowe 2004). From the students' point of view, assessment must be legally secure and accessible. The legal security for students

relies on a sound and reliable technical infrastructure and prompt responses from administrators and teachers.

The different ways in which online student assessments are organised can basically be categorised in terms of time, as synchronous or asynchronous, in terms of location, as formal, semi-formal or informal (Table 3).

Table 3 Organisation of e-learning student assessment

Assessment location	Formal*	Semi-formal** synchronous	Semi-formal asynchronous	Informal*** synchronous	Informal asynchronous
Benefits	Easy iden-tification	Easy identifica-tion, moderate flexibility of location	Easy identifica-tion, moderate flexibility of time and location	High flexibil-ity of location. Low costs for students, no travel, accom-modation, etc. needed	High flexibility of time and location. Low costs for students, no travel, accom-modation etc. needed
Drawbacks	Inflexible in terms of time and location, additional costs	Inflexible in terms of time, additional costs	Additional costs	Inflexible in terms of time, moderate identification concerns	High identifica-tion concerns. But e.g. Internet banking services have well-developed systems for se-curing identity in this mode

* On-campus,

** In localities not governed by the university but defined as learning centres, embassies etc.

*** Can be anywhere, only restricted by technical requirements such as computer and/or Internet access.

5. Flexibility and adaptability

One crucial quality aspect of e-learning is the degree of flexibility. A lot of people want to learn, but are restricted by working hours, family life, location, economy, available time, etc. Flexibility can be construed in many ways: flexible starting times, open course (no formal prerequisites), flexible study pace, flexibility of content and tasks (students can select and specialise), flexibility of location (where studies are pursued), flexibility of study method (communicated through many channels/modes) and ability to adapt to people with special needs. Nonetheless, flexibility has to be balanced against structure (see e.g. E-xcellence

2007, UNIQUe, QAA, appendix 1and 2). When open materials are presented and students can use them individually, a unified student experience cannot be expected (Connolly et al. 2005).

The new generation of students expects information to be easily accessible and communication to be possible from any place, any time and with anyone (Horizon report 2008). "Learning nomads" study at a distance but remain close to practice in the workplace or in the field. This type of e-learning is paradigmatically different from the classic distance education approach, where education was made accessible to people in remote areas because travel was not easy. Increased flexibility requires the availability of content and communication tools across different wireless systems and independent of hardware.

6. Support (student and staff)

A large number of studies have shown that support is crucial for successful e-learning implementation. summarised 36 research articles discussing support issues in e-learning according to four categories: faculty support for students; social support for students; support from employers; support for faculty. Muilenburg & Berge's (2005) report results from a comprehensive study of the main barriers to online learning from a student perspective. The factors found were: administrative issues; social interaction; academic skills; technical skills; learner motivation; time and support for studies; cost and access to the Internet; technical problems. Timely and adequate support can, according to the authors, significantly reduce the magnitude of these problems, but not totally eliminate them.

Support should be viewed as variable over time: support to prepare students and teachers for online studies, and support during the ongoing course (NADE 2002, Nätuniversitetet 2003). We believe the quality aspect of support issues includes the effectiveness of the organisation's support to students, teachers and other involved staff at all levels:

a) Technical
b) Academic, including librarians
c) Management
d) Social, including guidance counsellors.

The study guidance support is especially emphasised in the Nordic countries (NADE 2002, Nätuniversitetet 2003).

Support can be organised locally and/or at a distance, using synchronous and/or asynchronous communication. Support can also be organised ahead of time, and during an ongoing course using e-mail, chat, phone or other communication channels. What support is available, how to use it, who to contact, when and how to contact them, response time, etc., as well as what conditions apply, need to be communicated in a clear and consistent manner to teachers and students beforehand.

To a large extent, it is the effectiveness of support that determines the perceived quality of a course from the student's point of view. A study guide consisting of a basic single document describing the course as a whole and what is expected of the student, including assignment helps learning and reduces the need for in-course support due to unclear information.

Support is also important in order to establish a sustainable work situation for teachers who risk working too many hours and being responsible for too many parts of the e-learning process.

7. Staff qualifications and experience

The need for in-service training is not specific to online teachers, but in addition to normal professional development it might include the following objectives:

- Increasing awareness of using new technology
- How students learn through different media
- Expectations of and a critical approach to new technology
- Developing formative evaluation skills for improving learning design

It is also important to construct new models for the recruitment and retention of academic staff. According to Sixl-Daniell (2004), members of staff need to be both technologically and pedagogically oriented. It is also of utmost importance that technological know-how is integrated with pedagogical use (Yeung 2002).

However, individual teachers will not of their own be able to address all the issues connected with the development of an e-learning course and the actual teaching. They are dependent on additional expertise (Connolly et al. 2005). Setting up a multidisciplinary team for producing courses and material is a first step towards both supporting and developing staff skills. Besides the teacher, the

team would typically include librarians, instructional designers, multimedia producers and ICT experts.

8. Vision and institutional leadership

Universities that are involved in e-learning have to change and strengthen their management drastically throughout the organisation, from the direct relationship between teacher and learner to funding allocation, strategy and planning (Bates 1999, Marcus 2004, Jara 2006, Paulucci & Gambescia 2007). The changes are driven by the use of new technology and increased competition. New markets created by the elimination of geographical boundaries, the rise of non-governmental providers, as well as the increased diversity of learners, are all challenges to be met.

According to Bates (1999) one of the most important issues is the alignment of the policy for e-learning with the overall vision of the institution (see e.g. Bates, 1999). Organisational leadership has to "be explicit about who it is attempting to serve, how and why" (Moore & Kearsley 2005) and how e-learning fits into that vision. This is rarely done, not even by organisations with a long e-learning tradition (Zellweger Moser 2007). The adaptability of policy and planning must also keep pace with an increasing rate of change in pedagogical possibilities (Waysluk & Berge 2007). Management has to focus on transition, be proactive and serve as a role model, since changes in technology often produce chaotic situations (Marcus 2004). Furthermore, the institution's internal quality assessment model for teaching and learning has to be expanded to include criteria specific to e-learning. The establishment of the assessment procedure will naturally include a much more diverse group of senior managers (Ellis et al. 2007), some of whom will not previously have dealt with teaching and learning.

To encourage innovation, it is also important that the university has both earmarked resources and a clear strategy for research, quality assurance and development in e-learning (Bates 1999, Marcus 2004, Laurillard 2006, Gaytan 2007).

When different departments of a university are responsible for different parts of course development and the teaching process, new management strategies are needed to maintain cohesion (Ellis et. al 2007). Good management can be summarised by the following (Laurillard 2006):

- *Expanding knowledge*;provide access to journals, travel and learning material
- *Sharing knowledge*;set up multidisciplinary course development teams, set up forums or encourage participation in existing forums, reuse learning material, set up staff development programmes
- *Innovating*;allocate earmarked resources and staff time/commitment, establish policies for standards and infrastructure
- *Implementing*;reward excellence, communicate new requirements to staff and students
- *Validating*;monitor implementation and take action

Information and communication technologies are major drivers of the on-going, rapid globalisation process. E-learning is increasingly becoming an international phenomenon. Strategic alliances between universities, media companies, ICT providers and other stakeholders will be of great importance for sustainable and successful e-learning efforts.

9. Resource allocation

Staff time is inevitably the greatest cost in teaching and learning. When moving from face-to-face interaction to an e-learning environment, there is usually a dramatic shift in the amount of staff time spent on presentation to the amount of time spent on planning and design (Bates 1999, Laurillard 2006). In the implementation phase, increased funding may also be needed to address skills shortages – staff training, recruiting of staff with new competencies – as well as for reorganising the administration and technical infrastructure (Moore & Kearsley 2005).

During the build-up of new programmes, additional resources must be allocated to curriculum and course design. In e-learning programmes, this includes designing digital learning materials and reusing existing material. With the possibility of reuse, costs for e-learning can be substantially reduced if financial and intellectual property rights are clear.

The return on investments depends on student enrolment and sustainability. Marketing e-learning programmes does not necessarily have to cost more, but generally needs to focus on other target groups than traditional campus marketing. Bates (1999) also argues that funding strategies must start by providing centralised support to encourage project managers.

Examples of costs and benefits of e-learning compared to campus-based learning are presented in Table 4.

Table 4: Costs and benefits of e-learning compared to campus-based learning

	Campus	E-learning
Costs	Physical localitiesLecturingAdministration (technical infrastructure)	Technical infrastructure Staff training in ICT Student and staff support (ICT and technical) Recruitments Increased planning, designing Reorganisation of administration
Benefits	Low investment costs	New markets Widening participation Increased competitiveness Long-lived and reusable learning material

Communication is time-consuming and may be the main cause of burnout among e-learning teachers. Research on teacher burnout in higher education is limited, however, and almost non-existent in the case of e-learning (Hogan et al. 2007). As the e-learning teacher's role is complex, it is important to provide a clear job description and maintain clear lines of communication between administrative staff and teaching staff (Hogan et al. 2007). There have been several reports on the increased workload of staff working with e-learning, but also on programmes where the workload has decreased (O'Neill et al. 2004). The e-learning student often demands staff availability during evenings and weekends. This does not always imply an increased workload, but the shift in working hours has to be taken into account. New models for estimating workloads and a financial model for virtual lectures and interactive modules need to be set up (Bates 1999).

10. The holistic and process aspect

E-learning consists of multiple components, e.g. learning material, learning software, academic and technical support, presentation of content and interaction. All components must work together in an efficient manner (Rovai 2003).

The inherent complexity of e-learning in higher education has often been neglected (Zellweger Moser 2007). It is therefore not surprising that different quality aspects in many cases lack any (explicit) underlying coherence (Ellis & Moore 2006). A holistic perspective implies that all quality aspects together constitute a functional system. Therefore a change in one quality aspect, due to new technology, changed behaviour etc., usually requires adjustments of one or

more of the others. This implies that in the ELQ model presented above, all of the previous nine aspects are interrelated and constitute a coherent system.

Conclusion

The new digital learning environments and their content support communication, cooperation and interactivity in new and different ways. More planning is often needed to facilitate communication. The openness of these systems requires clear information on how they are intended to be used in the particular course/educational programme. The methods used to assess students' knowledge will determine the way they approach their studies and are therefore of prime pedagogical importance. The assessment methods should encourage creativity, critical thinking and in-depth knowledge of the subject matter. In e-learning, flexibility in terms of time and location offer the possibility of enhancing these aspects. At the same time, flexibility entails problems of security and authentication. Procedures and regulations have to be in place to certify accessibility, student identity and the authenticity of each individual student's knowledge contribution.

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