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E-learning quality

Aspects and criteria for evaluation of e-learning in higher education

HÖGSKOLEVERKET
Swedish National Agency for Higher Education

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Preface

The Swedish National Agency of Higher Education (HSV) has initiated a project to define quality in distance learning/e-learning. Work on the project began in 2006, with an evaluation of distance-based teacher training programmes.[1] In the same year an analysis of the current methods of evaluation used by the Swedish National Agency and the Danish Evaluation Institute was presented at the ICDE world conference in Rio de Janeiro, Brazil. The analysis aimed to identify the important variables for good quality in technology-based flexible education.[2]

In 2007, work began on an international knowledge survey, the results of which are included here. The report analyses how quality in e-learning is perceived within the EU, in a number of individual European countries, in the U.S. and Australia, and in international research. Based on this analysis, a model for e-learning quality – ELQ – has been developed.

The knowledge survey is intended to serve as a basis for the further development of the National Agency's evaluations of the quality of higher education, so that they may better capture the quality of distance learning programmes and other education programmes that are carried out using modern information and communication technology. Another aim of the survey is to contribute to international development efforts within the e-learning sector.

The knowledge survey was compiled by National Agency's Department of Evaluation. Eva Åström, project manager at the National Agency, managed the project. For data collection and analysis, two external experts were engaged: Henrik Hansson, PhD, Stockholm University, and Per Westman, PhD, NSHU[3]. Magnus Johansson, project manager at the National Agency, also participated.

The work of the National Agency on quality in e-learning will continue in 2008. There are plans for a project aimed at developing *methods* for evaluating higher education based on information and communication technology.

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1. Rapport 2007:41 R, *Vad är kvalitet i distansutbildning? Utvärdering av lärarutbildning på distans.*
2. The title of the paper is *National Evaluations of Quality in Flexible Education – the Cases of Sweden and Denmark*.
3. Swedish Agency for Networks and Cooperation in Higher Education.

Sammanfattning

Rapporten *E-learning quality. Aspects and criteria for evaluation of e-learning in higher education* ingår som en del i Högskoleverkets pågående satsning på att öka kunskapen om vad som utgör kvalitet i e-lärande, och hur denna kvalitet kan utvärderas inom ramen för ett nationellt kvalitetssäkringssystem.

I rapporten presenteras en modell för utvärdering av kvalitet i e-lärandet. Denna har utvecklats bland annat med stöd av analyser av policydokument, nätverkssamarbeten och utvecklingsprojekt som initierats inom ramen för det Europeiska samarbetet. En annan del av rapporten innehåller kortfattade beskrivningar och analyser av hur man inom nationella utvärderingsorganisationer och organisationer med särskilt uppdrag att främja nationell utveckling av e-lärande, hanterar frågan om kvalitetsutvärdering av e-lärande och distansutbildning. Denna del omfattar nio länder.

Analyserna visar att även om e-lärande uppmärksammas i många europeiska sammanhang och enskilda länder, så är det först under senare tid, och betydligt mer sporadiskt, som frågan väckts om hur kvaliteten i detta e-lärande ska bedömas. Kvalitet i e-lärande framstår på många håll som en icke-fråga.

Ett centralt underlag för den utvärderingsmodell som presenteras är den genomgång av aktuell forskning inom området som också ingår i rapporten.

Högskoleverkets modell för utvärdering av kvaliteten i e-lärande – *E-learning quality (ELQ)* – innehåller tio kvalitetsaspekter som enligt vår mening är centrala vid bedömning av kvaliteten i e-lärande:

- material/innehåll
- struktur/virtuell miljö
- kommunikation, samarbete och interaktivitet
- bedömningar av studenternas prestationer
- flexibilitet och anpassning
- support (till studenter och anställda)
- anställdas kompetens och erfarenhet
- ledarskap och visioner
- resursallokering
- process- och helhetssyn

Vi menar att kvaliteten i e-lärande måste bedömas ur ett systemperspektiv, dvs. att kvaliteten i utbildningen bestäms av samtliga ovanstående aspekter sammanvägda, samt relationen mellan dessa.

En annan central slutsats är, att om en nationell myndighet eller annan organisation ska utvärdera e-lärande räcker det inte med att utveckla kvalitetsaspekter. Den utvärderande organisationen behöver även utveckla och anpassa de egna arbetssätten samt säkra den interna kompetensen:

- De metoder som normalt används vid kvalitetsutvärdering behöver anpassas för att vara tillämpbara vid utvärdering av olika former av e-lärande.
- Kvalitetsaspekter för e-lärande behöver integreras i befintliga kvalitetssäkringssystem.
- Intern kompetensförsörjning och informationsförsörjning inom e-lärandeområdet behöver säkras.
- Interna arbetssätt behöver anpassas efter de särskilda villkor som utvärdering av gränsöverskridande utbildning innebär.

Summary

The report *E-learning quality. Aspects and criteria for evaluation of e-learning in higher education* is part of an ongoing endeavour by the Swedish National Agency of Higher Education to develop knowledge about what constitutes quality in e-learning, and how such quality may be assessed within the framework of a national quality assurance system.

The report presents a model for quality assessment of e-learning. This model has been developed using analyses of policy documents, networks and development projects initiated within the framework of European cooperation. Another section of the report contains brief descriptions and analyses of how different national assessment organisations and agencies charged with promoting the national development of e-learning deal with the question of quality assessment of e-learning and distance learning. These descriptions and analyses cover nine countries.

The analyses indicate that while e-learning is on the agenda in many European contexts and in individual countries, it is only recently – and much more sporadically – that the subject has been broached of how e-learning quality should be assessed. In many organisations, quality in e-learning appears to be a non-issue.

A survey of current research in the area is also included in the report, and serves as the central basis for the proposed assessment model.

The National Agency's model for assessing quality in e-learning – *E-learning quality (ELQ)* – comprises ten quality aspects which, in our view, are central to such assessments:

- Material/content
- Structure/virtual environment
- Communication, cooperation and interactivity
- Student assessment
- Flexibility and adaptability
- Support (student and staff)
- Staff qualifications and experience
- Vision and institutional leadership
- Resource allocation
- The holistic and process aspect

Further, it is our view that e-learning quality must be assessed from a systems perspective, i.e. that the quality of the education is determined by all of the above aspects taken together, and by their interrelationships.

Another central conclusion is that if a national agency or other organisation is to assess e-learning, it is not enough simply to draw up quality aspects. The assessing body also needs to develop and adapt its own working methods and guarantee its internal competence:

- Existing methods of quality assessment need to be adapted.
- Quality aspects for e-learning need to be integrated into existing quality assurance systems.
- Internal competence and the provision of information in the e-learning area need to be guaranteed.
- Internal working methods need to be adapted to the special conditions which apply for the assessment of borderless education.

Introduction

Quality assurance and e-learning in Sweden

Quality assurance of Swedish higher education

In Sweden, academic programmes are offered by 61 universities, university colleges and independent programme providers. The main tasks of the universities and university colleges are to provide undergraduate and postgraduate programmes and to interact with the surrounding community. A major proportion of state-funded research takes place at the universities and university colleges.

The Swedish National Agency for Higher Education is a central authority that deals with issues concerning Swedish universities and university colleges. The Agency's tasks include carrying out quality reviews, supervising, monitoring and developing higher education, producing reports and analyses, evaluating foreign qualifications, and providing information to students. Higher education institutions are responsible for the quality development of their programmes and for quality assurance.

A national quality assurance system was developed in 2001, when the National Agency was commissioned by the Swedish Government to evaluate all academic subjects and vocational programmes at all higher education institutions over a six-year period.

A new quality assurance system was launched in 2007. The new system is made up of five different components. These are:

- audits of the quality assurance mechanisms of the higher education institutions
- evaluations of subjects and programmes
- appraisals of the entitlement to award degrees
- thematic evaluations and thematic studies
- identification of centres of educational excellence

Distance education/e-learning in Sweden

In Sweden the same universities and university colleges that organise campus-based education also offer e-learning courses and programmes. This system is commonly called dual mode.

The policy in Sweden is that the same fundamental quality requirements should apply to e-learning as to campus-based higher education. How-

ever, there is also consensus that there are significant differences between e-learning and campus-based education. To address these differences, adjustments in the methods of evaluating higher education are required. Traditional quality criteria and evaluation methods do not identify and assess new aspects of higher education that are introduced by e-learning.

Swedish National Agency for Higher Education – Evaluation of distance-based teacher training programmes

In order to develop quality aspects and criteria that are adapted to distance education and e-learning, the Swedish National Agency for Higher Education initiated an evaluation of distance-based teacher training programmes in 2006 (National Agency 2007).

Five quality aspects of particular interest in distance/flexible/e-learning were identified:

- Information and communication technology[4]
- Planning and structure[5]
- Teacher skills[6]
- Adjustment to student needs[7]
- Infrastructure and organisation[8]

4. Criteria: **carefully planned ICT profile; the aims, content and method for education** should govern the choice of ICT tools; well-functioning ICT hardware and software; well-functioning technical support, offered both to students and to teachers/tutors; carefully planned introduction to the ICT tools, offered both to students and to teachers/tutors.
5. Criteria: **distinctive programme/course structure, including specified study** paths; carefully planned tutoring system; syllabi including both traditional literature and new digital learning resources.
6. Criteria: **access to in-service training; technical-pedagogical and distance teaching**; adjustment of teachers' working conditions.
7. **Criteria: aims of education that correspond to the needs of (distance) students;** planning and implementation of education that is consistent with students' needs, for instance regarding choice of hardware and software, and the amount of physical/digital meetings.
8. Criteria: **student access to technical support, library and study guidance; internal** and external professional cooperation and exchange in the planning and implementation of the programme/course; quality-assurance system which also covers teaching at external sites such as local study centres.

Swedish Net University Agency/NSHU – Quality criteria for IT-supported distance education

The Swedish Net University Agency was formed in 2002 with the aim of increasing access to and widening participation in higher education. In this context one of its tasks was to enhance distance education.[9]

A report on the quality of IT-supported distance education (Nätuniversitet, 2003) was compiled under the auspices of the agency in 2002–2003. The report focused on quality audits and defined four main quality processes:

1) Accessibility
2) Widening participation
3) Transfer of credits
4) Educational development

The quality processes were further divided into:

a) Prerequisites[10]
- Accessibility
- Widening participation
- Range of courses and transfer of credits
- Competence for IT-supported learning
- Student representation
- Technical support
- Library functions
- Study guidance

b) Implementation[11]
- Educational/didactic model
- Forms of assessment

c) Results and evaluation

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9. The Agency was closed down in 2006 and its tasks were taken over by the Swedish Agency for Networks and Cooperation in Higher Education (NSHU).
10. *Prerequisite*: The report points out that both staff and students need technical advice and support during the entire process, but that this is especially important before the programme starts. Flexibility and accessibility were primary points of focus. The needs of students with disabilities should be met. Continuous in-service training of all staff categories and cooperative teamwork in planning and constructing courses are other major changes compared to traditional on-campus education.
11. *Implementation*: The criteria for implementation bear a striking similarity to on-campus criteria. It is worth noting that greater emphasis is placed on the importance of the organisation of instruction and the learning environment. Another major issue is the planning of activities for the periods when students and teachers do not meet e.g. asynchronous communication interactivity with digital material etc.

Aims, framework and methods

Questions to be answered

The main aim of this review is to provide a synthesis based on Swedish and international research and practice in quality and quality assessment of e-learning. It is meant to be used as a basis for strategic development of the Swedish National Agency for Higher Education's quality-assurance system. In the report we identify problematic areas and give some recommendations for quality aspects and criteria to complement the Agency's existing criteria.

To this end, the following questions are put forward:

- What constitutes quality in e-learning in higher education according to:
  - Swedish policy?
  - EU policies, EU development projects and European networks and organisations?
  - National agencies and organisations in Sweden, Norway, Finland, Denmark, the UK, the Netherlands, Australia, Canada and the U.S.?
  - Recent research in the field of e-learning?

Methods and sources of information

The report is based on the following material and procedures related to the four questions above:

1. The Swedish context and current situation

- Summary and analysis of policy documents from the Swedish National Agency for Higher Education and the Swedish Net University Agency/NSHU concerning e-learning in higher education (in the introductory chapter).

2. The European Union context and current situation

- Summary and analysis of relevant policy documents concerning e-learning in higher education within the European Union.
- Analysis of selected e-learning projects and organisations at the EU level.

3. Approaches adopted by national agencies in other countries

- An e-mail questionnaire to national agencies and organisations for higher education/e-learning in higher education in Australia, Canada,

Denmark, Finland, the Netherlands, Norway and the United Kingdom requesting relevant reports, books, documents, URLs, and contact persons for further interviews.[12]
- Summary and analysis of relevant information and documents obtained from the national agencies and organisations above, and from the Council for Higher Education Accreditation (CHEA) and the Distance Education and Training Council (DECT) in the United States.

4. Issues and quality aspects of e-learning in higher education discussed in current research
- Analysis of e-learning articles published between 2002 and 2007 in online databases for e-journals available at the Mid Sweden University, using the following descriptors: "Quality assessment higher education", "Quality evaluation higher education" and "Quality audit higher education" combined with one or several of the following keywords: "e-learning", "online" and "distance".
- Analysis of selected literature cited in the articles accumulated in the original searches above.
- Inductive study of the most recently published articles in two e-learning journals: the European Journal of Open and Distance Learning (EURODL) and the International Review of Research in Open and Distance Learning (IRRODL).

Definitions and scope

In this report we have chosen the term *e-learning* (120 million hits[13]) to signify all forms of technology-supported learning, such as distance learn-

12. The organisations and agencies are: The Swedish Agency for Flexible Learning; The Swedish Agency for Networks and Cooperation in Higher Education; The Norwegian Agency for Quality Assurance in Education; Norway Opening Universities; The Norwegian Networked University; The Finnish Higher Education Evaluation Council; The Finnish Virtual University; The Danish Evaluation Institute; The Danish Association of Flexible Learning; Centre for Higher Education Research and Information (UK); The Quality Assurance Agency for Higher Education (UK); The Open University (UK); The Centre for Research and Evaluation (UK); Quality Assurance Netherlands Universities; Nederlands-Vlaamse Accreditatieorganisatie; The European Association for Distance Learning; The Australian Universities Quality Agency; The Open and Distance Learning and Association of Australia; The Higher Education Quality Council of Ontario; The Commission d'évaluation de l'enseignement collégial du Québec; The Canadian Network for Innovation in Education.
13. Number of hits on Google, 21 December 2007.

ing, online learning, online education, distance education, technology-enhanced education, flexible learning, flexible education and IT-supported education. The concept of e-learning is relevant both in distance education and campus-based learning: "E-learning is naturally suited to distance learning and flexible learning, but can also be used in conjunction with face-to-face teaching, in which case the term *blended learning* is commonly used."[14]

A recurrent theme in the discussion about e-learning is whether it offers higher or lower quality than other higher education. The quality of e-learning has often been viewed with scepticism and been the target of criticism (e.g. Zhao, 2003; Yeung, 2002; Rovai, 2003). This criticism has focused on the lack of (physical) interaction (Yeung 2002 and ref. therein), technical problems (Zhao 2003), or a technological and aesthetic focus instead of an educational one (Barbera 2004).[15] Other research reports show that the course delivery medium is rarely the determining factor for quality (Rovai 2003), or that online education in itself can be a quality enhancement factor in terms of accessibility, collaboration or community-building, for either teachers or learners (e.g. Connolly et al. 2005, Jara 2006).

The issue of whether e-learning offers higher, equal or lower quality in comparison to other types of education has not been dealt with in this report. Instead, the report focuses on the more open question of what quality in e-learning actually comprises. How can quality be defined in this context in order to be assessed?

14. Wikipedia, 22 February 2008.

15. In "Teaching courses online: a review of the research" (Tallent-Runnels et al. 2006), the authors show that the learning outcomes appear to be the same as in traditional courses. David Noble (1998), on the other hand, argues that higher education institutions are going too far in the hunt for cost reductions, leading to the automation of higher education and its transformation into diploma mills with a global reach. Nicholas Burbules (2000) discusses old and new problems in education which have been reinforced by ICT. He brings up issues such as the quality of information, credibility and misleading information.

The European view on e-learning and the assessment of quality

Decisions made within the framework of European cooperation on e-learning, implemented policies and national development projects all affect the conditions for the work undertaken in individual Member States.

This chapter describes a number of policies, projects, organisations and networks which we perceive as being in some way key to, or representative of, the views on quality and quality assurance in e-learning that feature in European cooperation.

The European Commission's eLearning Action Plan

In May 2000, the *eLearning: designing tomorrow's education initiative* was adopted by the European Commission. This initiative was part of the comprehensive *eEurope Action Plan*[16] that aimed to overcome the barriers holding back the utilisation of digital resources in Europe.

In 2001, the *eLearning Action Plan* was formulated to present ways of implementing the eLearning initiative. The action plan covers the period 2001-2004. It explains how e-learning fits into the context of eEurope, i.e. how the use of new multimedia technologies and the Internet can improve the quality of learning by facilitating access to resources and services as well as exchanges and collaboration. E-learning is defined as an essential precondition for lifelong learning and therefore also as a driving force underlying cohesive and inclusive societies and competitive economies.

The initiative places emphasis on creating appropriate conditions for the development of content, services and learning environments which are sufficiently advanced and relevant to education. The availability of standards is described as particularly important. The importance of established conditions conducive to change and to adaptation of the ways in which education and training systems are organised is also emphasised.

Four lines of action have been identified, i.e. areas of particular importance for the successful implementation of e-learning in Europe:

16. http://ec.europa.eu/information_society/eeurope/2002/action_plan/pdf/action-plan_en.pdf.

- Infrastructure and equipment
- training
- services and content
- cooperation and dialogue

The European Union's eLearning programme

About the programme

Through the eLearning Initiative and Action Plan, the European Commission has gained experience in encouraging cooperation, networking and the exchange of good practice on a European level. *The eLearning programme*[17] is described as a further step towards realising the vision of enabling technology to serve lifelong learning. The aim of the eLearning programme is the effective integration of information and communication technologies (ICT) in education and training systems in Europe (2004 – 2006).

The programme focuses on a set of actions in high priority areas, which were chosen for their strategic relevance to the modernisation of Europe's education and training systems. These four lines of action are:

- Promoting digital literacy
- European virtual campuses
- e-Twinning of schools in Europe and the promotion of teacher training
- Transversal actions for the promotion of e-learning in Europe

Horizontal E-learning Integrated Observation System (HELIOS)

The Horizontal E-learning Integrated Observation System (HELIOS)[18] project is supported by the European Commission within the framework of the eLearning Programme. It is a research project intended to establish a sustainable observation platform for monitoring the progress of e-learning in Europe vis-à-vis policy objectives, and to forecast future scenarios of e-learning evolution.

HELIOS aims to show not only the state of development of e-learning, but also the impact of e-learning on the following policy priorities:

17. http://europa.eu/scadplus/leg/en/cha/c11073.htm.
18. http://ec.europa.eu/education/archive/elearning/projects/.

- Access to learning
- Employability
- Personal development/citizenship
- Internationalisation of education and training
- Organisational change
- Innovation of education and training

Six thematic reports have been produced for each of the policy areas above.[19]

E-xcellence

E-xcellence[20] is a two-year project, which was undertaken under the auspices of EADTU[21] and co-funded by the European Commission eLearning programme. E-xcellence aims to supplement existing systems of quality assurance on e-learning specific issues, by focusing on parameters of quality assurance that govern e-learning. A quick scan tool for self-assessment has been developed that contains thirty-three benchmarks. The benchmarks are divided into six areas: strategic management; curriculum design; course design; course delivery; staff support; student support (Appendix 1). The project involves a pool of experts from twelve European institutions.

There will be an extension of the E-xcellence project aimed at implementing the quick scan tool in thirteen countries between 2008 and 2010. It will also involve making three complete evaluations of higher education programmes and extending the network of experts for assessment of e-learning courses and programmes.

Sustainable environment for the evaluation of quality in e-learning (SEEQUEL)

The Sustainable Environment for the Evaluation of Quality in E-Learning (SEEQUEL) project[22] originates from the joint initiative of the e-Learning Industry Group (eLIG) and of a number of European expert organizations and associations at all levels of education and training.[23]

19. www.education-observatories.net/helios.
20. www.eadtu.nl/e-xcellenceqs/.
21. European Association of Distance Teaching Universities, www.eadtu.nl.
22. www.education-observatories.net/seequel/index.
23. The SEEQUEL project is co-funded by the European Commission, DG education and Culture under the eLearning initiative.

The project objectives are to address the need for a common strategy to define and implement international quality standards. A core quality framework for e-learning in all educational contexts has been developed. SEEQUEL does not aim for a normative definition of quality. The criteria can be weighted depending on the user profile. The framework comprises three areas (see also Appendix 1):

- Learning sources
- Core learning processes
- Learning context

The Triangle Project

The Triangle project[24] is funded by the European Commission. Its main objectives are:

- to promote European diversity in quality approaches and services in the field of learning, education and training
- to connect results and concepts for European e-learning quality as developed in three e-learning quality projects: SEEL,[25] EQO[26] and SEEQUEL
- to broaden the discussion and discourse on e-learning quality
- to provide a sustainable infrastructure as a single entry point for e-learning quality.

European University Quality in eLearning (UNIQUe)

The UNIQUe project[27] aims to enhance the reform process of European higher education institutions by creating an eLearning quality label for ICT-use in higher education. The report *eLearning quality in European Universities* was produced in 2007. It concluded that "within Europe a broadly acceptable Quality Accreditation system in e-learning within HE

24 www.qualityfoundation.org/ww/en/pub/efquel/about/what_is_efquel_/what_is_triangle_.htm.

25. The SEEL project focuses on the impact of e-learning quality policies on local and regional development. Among the activities included are identification of cultural issues and comparisons of regional implementation of benchmarking schemes.

26. The European Quality Observatory (EQO) is an Internet-based repository for documented work on quality assessment, quality assurance and quality management for schools, vocational training and Universities. The repository is now integrated in the EFQUEL website.

27. http://unique.europace.org/. The project is co-financed under the Socrates programme.

is absent despite the need to support HE in order to face the challenges presented by the emerging needs associated with the introduction of new technologies."

An e-learning quality label for university accreditation has been launched, including quality areas and criteria (Appendix 1), and a network of peer reviewers is being established.

Lifelong learning programme 2007–2013

The European Commission's *Lifelong learning programme 2007–2013*[28] is described as the new EU umbrella for education and training programmes. The Lifelong Learning Programme comprises four sectoral programmes on

- school education (*Comenius*)
- higher education (*Erasmus*)
- vocational training *(Leonardo da Vinci*)
- adult education (*Grundtvig*)

It is supplemented by a transversal programme that focuses on policy cooperation, languages, information and communication technology and dissemination and exploitation of results.

The aim of the new programme is to use lifelong learning to contribute to the development of the community into an advanced knowledge society. Promotion of ICT in learning is one objective of the programme as a whole. The ICT component focuses on how learning can be enhanced: bridging the "digital gap" between groups and countries, attracting drop-outs back to learning, and enabling learning outside formal learning environments.

Selected European organisations and networks

European Distance and E-learning Network (EDEN)

The aim of the European Distance and E-Learning Network (EDEN)[29] is to share knowledge and improve understanding of distance education and e-learning across Europe and beyond, and to promote policy and practice

28. http://ec.europa.eu/education/programmes/newprog/index.

29. www.eden-online.org/eden.

in this field of endeavour. The association embraces all levels of formal and non-formal education and training.

EDEN was established in 1991, and today it has over 1,000 individual members and 197 institutional members. It supports its own open source journal, EURODL[30], and provides support and advice to a range of projects in the European sphere.

European Foundation for Quality in eLearning (EFQUEL)

The European Foundation for Quality in eLearning (EFQUEL)[31] is a European membership organisation that was established in 2005. Its mission is to enhance the quality of e-learning in Europe by providing services and support for all stakeholders. It is an initiative of the *Triangle project* that is funded by the European Commission.

One of EFQUEL's objectives is to establish a European Quality Mark Initiative (EQM). The perceived lack of quality is recognised as an inhibiting factor for the expansion of e-learning. Approaches to the quality of e-learning are furthermore described as numerous and confusing. The existence of a European quality-assurance system might, according to EFQUEL, contribute to strengthening cross-country confidence in the quality of e-learning, and serve as a reference worldwide.

According to EFQUEL, the classic approaches to quality assessment, e.g. defining and documenting minimal requirements of infrastructure, staff competence, administrative compliance and technical standards, are inadequate if the aim of the quality assurance process is to encourage innovation in e-learning.

A list of elements to serve as the starting point for an alternative approach to quality assurance is provided:[32]

A) A set of design principles

- *Integration* of EQM in organisational and institutional procedures for quality development and quality assurance
- *Innovation* as embeddedness in transformation processes
- *Transparency* of the process and of the results of EQM
- *Modularity* of the EQM: not all elements may be selected as candidates for accreditation

30. www.eurodl.org.

31. www.qualityfoundation.org/ww/en/pub/efquel/.

32. *Quality Assurance and Accreditation for European eLearning: the case for a European Quality Mark Initiative* (No. 4, 2007).

- *Efficiency*: avoidance of unnecessary formalisms and overload of documents
- *Relevance* to the quality of the learning experience, avoiding focusing on peripheral elements of good practice typical of any organisation, but not decisive for the quality of e-learning
- *Context sensitivity*, building on what is accepted in the local/sector context as good practice while proposing new elements
- *Scalability* of the model from pilot phase to full deployment
- *Adaptability* to future needs and changing conditions (technological, but also institutional, organisational, economic, cultural and pedagogical) for the use of ICT in learning systems.

B) An agreement to regard the quality of the learning experience as a whole

C) A common focus on innovation and organisational transformation, and a commitment to a "competent customer"

D) A principle of negotiation and, wherever possible, full inter-cultural consensus building among partners.

E) An agreement on the five steps necessary to achieve accreditation:

- definition of criteria and indicators
- positioning, self diagnosis and internal preparation
- peer review
- improvement plan implemented and documented
- accreditation (for a limited time) (Methodology)

This approach is envisaged in the many projects with which EFQUEL is involved (e.g. UNIQUe, SEQUEL, EQO).

European Association for Quality Assurance in Higher Education (ENQA)

The European Association for Quality Assurance in Higher Education (ENQA)[33] disseminates information, experiences and good practice in the field of quality assurance of higher education. ENQA has 36 full member agencies.

In March 2005, ENQA published *Standards and Guidelines for Quality Assurance in the Higher Education Area*. The document contains standards and guidelines for internal quality assurance within higher education institutions, European standards for the external quality assurance of higher

33. www.enqa.eu/.

education and European standards for external quality assurance agencies. Quality assurance of e-learning was not mentioned.

However, the ENQA work plan for 2008 states that "ENQA has conducted initial discussions with EADTU (European Association of Distance Teaching Universities) on a possible joint project dealing with the quality assurance of e-learning, which might figure as one of the future areas of emphasis for the Association."

European Centre for the Development of Vocational training (CEDEFOP)

The European Centre for the Development of Vocational training (CEDEFOP)[34] is the European Agency that promotes development of vocational education and training in the European Union.

The CEDEFOP study, *Quality in e-learning. Use and dissemination of quality approaches in European e-learning*[35] was carried out in 2004 as part of the EU-supported research project European Quality Observatory.

One major finding was that quality in e-learning improves when fixed concepts that are applied universally are avoided. Flexibility and negotiation are the paths recommended for achieving high quality in this field. Another conclusion is that quality is regarded as being very important, but quality strategies are seldom implemented in practice, due to a lack of knowledge in this field – "We need more quality competence for e-learning in Europe" (p 7).

On the basis of the results, ten guidelines for shaping the quality of e-learning were formulated (Appendix 1).

The authors outline a set of key words – requirements – for formulating a general standard for certifying e-learning provisions: participation; transparency; degree of familiarity and acceptance; openness; adaptability and scalability; harmonisation and integration; integrated methodology; quality awareness; measurability.

The content of the standard – the actual meaning of quality in e-learning – is not discussed in the report.

34. www.cedefop.europa.eu/.

35. www.trainingvillage.gr/etv/Upload/Information_resources/Bookshop/411/5162_en.pdf.

Conclusions – The European view on e-learning and the assessment of quality

In this survey we have studied three general EU policy documents with a bearing on e-learning: The European Commission's eLearning Action Plan, the European Union's eLearning Programme and the European Commission's Lifelong Learning programme. All of these argue for an increased use of new multimedia technologies and the Internet in the context of lifelong learning. By promoting learning initiatives that are enhanced by information and communication technology, the reasoning goes, the conditions will be created for cohesive, inclusive knowledge societies and competitive economies.

Quality in e-learning is not the focus of these policy documents. Instead they are primarily concerned with arguments and initiatives promoting e-learning *per se*. This appears to be the common pattern in EU initiatives related to e-learning.

However, within the framework of – or at the initiative of – the eLearning Programme, several projects concerned with the issue of quality have been launched. In this study we have looked at some of these, including E-xcellence and UNIQUe. They both offer a quality framework for e-learning and focus on the quality of the learning/teaching processes. Additionally, they both indicate certain institutional prerequisites for educational quality. The E-xcellence project, for example, highlights the importance of strategic management, administrative support, strategies for handling intellectual property rights and student access to the library, helpdesk and counselling. Both E-xcellence and UNIQUe are also involved in setting up networks of experts who can assess quality in e-learning.

The aim of the UNIQUe project is to develop an e-learning quality label for university accreditation with full focus on institutional factors as a means of improving quality in higher education.

We have also referred to two organisations linked to the EU, both of which are actively involved in pursuing the issue of quality in e-learning in theory and practice: CEDEFOP and EFQUEL.

Quality assessment of e-learning in selected countries

Many countries today have both Government agencies and organisations devoted to quality assurance of higher education, as well as other bodies with the specific task of promoting distance learning/e-learning.

In this chapter we present examples from eight countries of how the issues of quality assurance of higher education in general, and e-learning in particular, are dealt with by the institutions concerned.

Norway

Norwegian Agency for Quality Assurance in Education (NOKUT)

The Norwegian Agency for Quality Assurance in Education (NOKUT)[36] was established in 2002. The agency performs external quality assurance of higher education and tertiary vocational education in Norway.

NOKUT foresees a convergence between different forms of learning (i.e. distance, net-based, net supported and campus-based education). A project to develop joint criteria for campus-based higher education and distance education has been initiated.

Norway Opening Universities (NOU)

Norway Opening Universities (NOU)[37] is a national agency for the promotion of flexible and lifelong learning in higher education. NOU's mission is to be achieved through four different functions: information, funding projects, the development and enhancement of the national knowledge base and by offering an arena for networks and meetings.

The agency has not formulated quality criteria for e-learning, but has studied issues ranging from technical infrastructure to widening participation in several reports.

36. www.nokut.no/.

37. www.norgesuniversitetet.no/.

Norwegian Association for Distance Education (NADE)

The Norwegian Association for Distance Education (NADE)[38] is an organisation for institutions involved in e-learning and distance education. It was established in 1968, and has since played an active role in the development of distance education in Norway. NADE published quality standards for distance education in 1993, with revisions in 1996 and 2001 (NADE 2002, Appendix 2).

NADE's criteria are divided into prerequisites, implementation, results and follow-up. These phases are further divided into:

- Information and counselling
- Course development
- Education
- Organisation

The criteria include the impact of information and study guidance on non-recruited students and on Norwegian society as a whole. Widening participation is also regarded as a core issue. Higher education is to provide adults with the means of achieving personal, social and cultural development.

Norwegian Networked University (NVU)

The Norwegian Networked University (NVU)[39] is a cooperation project that includes six universities and colleges that focus on flexible learning.

NVU has formulated internal quality criteria for e-learning. Like the NADE criteria, they are divided into prerequisites, implementation and evaluation. Target groups are administrators, course managers and course participants. The project comprises a checklist, advice and benchmarks for all three categories.

Finland

Finnish Higher Education Evaluation Council (FINHEEC)

The Finnish Higher Education Evaluation Council (FINHEEC)[40] is a national evaluation agency for higher education institutions whose tasks are defined by governmental decrees. The Universities Act and the Polytechnics Act stipulate the obligation of the higher education institutions

38. www.nade-nff.no/.
39. www.nvu.no/.
40 www.finheec.fi/.

to participate in evaluations carried out by FINHEEC. The results of such evaluations, and the reports, are public.

There are no references to specific e-learning indicators/benchmarks on the website.

Finnish Virtual University (FVU)

The Finnish Virtual University (FVU)[41] is a network consortium of Finland's 21 universities. It supports and develops collaboration among universities relating to the use of information and communication technologies for teaching and studying. As a consortium it develops information, network-based training and educational services for the shared use of its member universities.

FVU does not carry out any national evaluations of the quality of e-learning.

Denmark

Danish Evaluation Institute (EVA)

The primary task of the Danish Evaluation Institute (EVA)[42] is to initiate and conduct evaluations of education at all levels – from child care, primary and secondary education to tertiary vocational education (e.g. nurse and teacher training programmes) and higher education under the Ministry of Culture (e.g. theatre/drama school).

The Institute is also the national centre of knowledge for educational evaluation, and part of its mission is to compile, produce and disseminate national as well as international experiences in the field of evaluation and quality assurance of child care, teaching and education.

No specific criteria for the quality of e-learning are included in the national evaluations carried out by EVA.

Danish Council for Accreditation (ACE Denmark)

In 2007 the Danish Ministry of Education established a new council and a new institution for accreditation (ACE Denmark)[43]. ACE Denmark will include a secretariat specialised in accreditation. According to the new Danish accreditation law (1 April 2007), the council will decide if and

41. www.virtuaaliyliopisto.fi/.

42. www.eva.dk/.

43. www.acedenmark.dk/.

how an education programme is to be accredited. Accreditation can be carried out either by the specialised secretariat or by another institution appointed by the council. Each accreditation is to be planned and carried out individually. The criteria used in accreditations are aligned with the criteria defined by ENQA.

ACE Denmark's mission is to carry out evaluations and accreditations of both new and existing education programmes at Danish universities.

At the time this is being written, no policy on how to evaluate or accredit e-learning had been developed.

The Netherlands

Accreditation Organisation of the Netherlands and Flanders (NVAO)

The Accreditation Organisation of the Netherlands and Flanders (NVAO)[44] ensures the quality of higher education in the Netherlands and Flanders by assessing and accrediting programmes, and it contributes to enhancing their quality. NVAO has been involved in the EADTU project E-xcellence, but is in general not concerned with quality in e-learning. The organisation states that its accreditation framework is capable of accommodating e-learning.

NVAO has been given the legal task of annually drawing up a list of quality assessment agencies which are considered capable of producing assessment reports that meet NVAO requirements.

SURF

SURF[45] is a Dutch collaborative organisation for higher education institutions and research institutes that concentrate on pioneering innovations in information and communication technology (ICT). Its mission is to provide the foundation for excellence in higher education and research in the Netherlands. SURF consists of three organisations, each of which has its own field of activity: SURFfoundation, SURFnet and SURFdiensten.

SURFfoundation initiates, guides and stimulates ICT innovation in the Netherlands by sharing knowledge and partnership.

There are no references to specific e-learning indicators/benchmarks on the website.

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44. www.nvao.net/.

45. www.surf.nl/.

United Kingdom

Quality Assurance Agency for Higher Education (QAA)

In 1997, the Quality Assurance Agency for Higher Education (QAA)[46] was established to provide an integrated quality assurance service for higher education in the UK. Although the QAA is an all-UK body, approaches in England, Scotland, Wales and Northern Ireland vary somewhat. The QAA is not a governmental organisation, although it is partly funded by the Government through contracts with departments. The QAA is also funded by subscriptions from the higher education institutions and through contracts with higher education funding bodies like HEFCE.

As part of its development of a comprehensive quality assurance process for higher education, the QAA has produced a Code of Practice for Quality Assurance in Higher Education in the form of a series of self-contained sections covering the management of quality and standards in all teaching and learning activities. In one of these the agency has developed guidelines on the quality assurance of distance learning (Appendix 2). The guidelines, which do not in their current form have the status of a section of the Code of Practice, will in due course be reviewed and become the basis for a code of practice for distance learning which will be incorporated into the wider QAA Code.

Joint Information Systems Committee (JISC)

The Joint Information Systems Committee (JISC)[47] is an advisory committee to the higher education funding councils of England, Scotland, Wales and Northern Ireland. The mission of JISC is to provide leadership in the innovative use of ICT to support education and research. JISC funds a range of programmes, services and activities that promote and support the use of e-learning. The majority of JISC's endeavours aim to identify how e-learning can benefit learners, practitioners and educational institutions, and to offer advice on its implementation.

46. www.qaa.ac.uk/.

47. www.jisc.ac.uk/.

The Higher Education Academy (HEA)

The Higher Education Academy (HEA)[48] is a membership organisation owned by Universities UK[49] and GuildHE.[50] Its mission is to help institutions, groups of disciplines and all staff to provide the best possible learning experience for their students. Together with JISC, HEA is currently benchmarking e-learning exercises with 27 universities within the UK. Three different benchmarking models are being tested.[51]

The Open University (OU)

The Open University (OU)[52] is the UK's only university dedicated to distance learning. It was founded in 1969, and the first courses began in 1971. Today the OU has around 150,000 undergraduate students and over 30,000 postgraduate students.

The OU has 13 regional centres across the UK, but over 25,000 of its students pursue their studies outside the UK. Most students study part-time. One third of the undergraduate students are sponsored by their employers. In general, undergraduate courses have no entry prerequisites. About 10,000 of the students have disabilities.

Qualifications awarded by the OU are recognised by academic institutions throughout the UK, the European Union and the rest of the world.

In the UK, there are about 60 Centres of Excellence in Teaching and Learning, CETL. Four of these are part of the Open University.

The Open University's internal quality processes

The OU defines quality in education as: *fitness of learning materials or services to enable students to achieve desired standard of performance*, in short "fitness for purpose". Standard is defined as a description of the level of achievement expected of successful students.

In its internal quality evaluation processes, the OU focuses on three types of products or services:

48. www.universitiesuk.ac.uk/.
49. Currently, Universities UK has 132 members, comprising the executive heads of all UK university institutions and some colleges of higher education.
50. GuildHE is a representative organisation within the higher education sector. Its members comprise higher education colleges, specialist institutions and some universities.
51. www.heacademy.ac.uk/ourwork/learning/elearning/benchmarking.
52. www.open.ac.uk/.

- *Learning materials*, i.e. printed text, eBooks, audio and/or visual materials, CD-ROMs (text/simulations), DVDs (multi-media learning materials)
- *Learning services*, i.e. digital resources in the virtual library, laboratory experience, career guidance, helpdesk (for online operation), call centre for general advice
- *Student support*, i.e. face-to-face tutoring for course material, online tutoring, feedback on assignments, one-to-one support by telephone or e-mail

The OU also specifies four aspects that are important for quality in open and distance learning:
- *Academic content* (correct argument and correct description)
- *Pedagogical method* (effective learning material)
- *Media product* (compared to commercial products)
- *Quality of service* (delivery on time and software that works)

The OU uses three types of quality processes:
- *Quality control*, a process that operates post production or delivery to determine that everything works
- *Quality assurance*, a process applied during production to assure fitness
- *Quality enhancement*, a process that assures improvement

Australia

Australian Universities Quality Agency (AUQA)

The Australian Universities Quality Agency (AUQA)[53] is an independent, non-profit national agency that promotes, audits, and reports on quality assurance in Australian higher education. It provides a database of good examples, which is accessible from its website. There is no specific entry for e-learning but the entry for IT and library includes good examples of learning management systems and e-library.[54] The website also has links to different quality related resources, including ACODE, for e-learning (see below). There are no references to specific e-learning indicators/benchmarks on the website.

53. www.auqa.edu.au/.
54. www.auqa.edu.au/gp/.

Australasian Council on Open, Distance and E-learning (ACODE)

The Australasian Council on Open, Distance and E-learning (ACODE)[55] is an Australasian organisation for universities that are engaged or interested in open, distance, flexible and e-learning. Its mission is to enhance policy and practice in these areas.

ACODE seeks to influence policy and practice at institutional, national and international levels through:

- disseminating and sharing knowledge and expertise
- supporting professional development and providing networking opportunities
- investigating, developing and evaluating new approaches
- advising and influencing key bodies in higher education
- promoting best practice.

The document *Benchmarks for the use of technology in learning and teaching in universities* that was developed by ACODE (Appendix 2) provides eight perspectives (benchmarks) for assessment. Each benchmark includes several performance indicators, measured using five different grade scales. The method was developed as a self-assessment guideline or as a collaborative benchmarking exercise in order to support the continuous quality improvement process.

The ACODE approach focuses on the following benchmarks :

- Institution policy and governance for technology supported learning and teaching.
- Planning for, and quality improvement of, the integration of technologies for learning and teaching.
- Information technology infrastructure to support learning and teaching.
- Pedagogical application of information and communication technology.
- Professional/staff development for the effective use of technologies for learning and teaching
- Staff support for the use of technologies for learning and teaching.
- Student training for the effective use of technologies for learning.
- Student support for the use of technologies for learning.

55. www.acode.edu.au/.

Canada

There is no national system of educational quality assurance in Canada. Post-secondary education is the responsibility of the provincial and territorial governments, and each jurisdiction has its own quality assurance mechanisms. Neither is there any national accrediting body to evaluate the quality of degree programmes, although a number of agencies and professional bodies perform this function for professional programmes at both undergraduate and graduate levels at some institutions.

In the absence of a national accrediting body, university membership in the Association of Universities and Colleges of Canada[56] (AUCC) is generally taken as evidence that an institution is providing university-level programmes of acceptable standards. Degree programmes at university colleges, colleges, and institutes are subject to internal quality assurance processes similar to processes used for university programmes.

USA

Council for Higher Education Accreditation (CHEA)

The Council for Higher Education Accreditation (CHEA)[57] is a private non-profit national organisation that coordinates accreditation activities in the U.S. CHEA is the only non-governmental higher education organisation that conducts certification of the quality of regional, faith-based, private career and programmatic accrediting organisations. (The Federal Government, through the Department of Education, conducts governmental recognition reviews.)

In 2002 CHEA published the paper *Accreditation and assuring quality in distance learning* (CHEA 2002, Appendix 2). The paper identifies seven key areas which are routinely reviewed in distance education:

- Institutional mission
- Institutional organisation structure
- Institutional resources
- Curriculum and instruction
- Faculty support
- Student support
- Student learning outcomes

56. www.aucc.ca/.

57. www.chea.org/.

The paper also discusses the key areas in the context of three major challenges for quality assurance of distance education:

- *Alternative design of instruction*. Particular weight is given to this challenge in the following areas: curriculum and instruction, faculty support, student support and student learning outcomes. The accreditation relies on a cadre of academics specialising in alternative design both for site visits and the development of standards.
- *Alternative providers of higher education*. The focus here is on all seven key areas. Single mode providers with no physical facilities are scrutinised for instance for virtual equivalents to different student services.
- *Expanded focus on training*. Should the scope of accreditation be further expanded to include assuring the quality of independent and discrete learning activities?

Distance Education and Training Council (DETC)

The Distance Education and Training Council (DETC)[58] was founded in 1926 to promote sound educational standards and ethical business practices within correspondence education. It is a nationally recognised accrediting agency in the US.

The council has produced a handbook for accreditation of distance education institutions including secondary, post-secondary and degree-granting education.[59] In 2007, 53 degree-granting institutions were accredited according to DETC standards. The standards are divided into 12 topical areas (Appendix 2). The standards have a clear focus on widening participation, and emphasise the need to meet the individual differences of students with different backgrounds.

58. www.detc.org/.

59. www.detc.org/acredditHandbk.html.

Conclusions - Quality assessment of e-learning in selected countries

In this knowledge survey, we have looked at how eight countries (nine including Sweden) deal with e-learning and the related issues of quality at the national level.

Our conclusion is that quality assessment of e-learning generally seems to be more or less a non-issue for the national agencies and organisations responsible for quality assurance of higher education. In Norway (NOKUT) and Sweden (National Agency), small-scale projects are under way in 2007 to develop special e-learning quality criteria, and the UK's QAA has drawn up guidelines on the quality assessment of distance learning. None of these, however, nor any of the other countries, include e-learning quality as a regular or integral part of national quality reviews. No emphasis is placed either in the standards and guidelines established by ENQA, the European body for cooperation among the national quality assurance organisations, on quality in e-learning. In the U.S, CHEA has drawn up guidelines for accreditation and assurance of quality in distance learning.

All of the countries included in the survey also have national bodies with specific responsibility for promoting distance learning or e-learning in higher education. Some of these have established general quality criteria for e-learning. In Norway, NADE published quality criteria for distance learning as early as 1993. In the UK, JISC and HEA collaborate on methodological development for and assessment of e-learning. The Australasian organisation ACODE has published extensive benchmarks with the aim of influencing policy and practice at institutional, national and international levels, and in the U.S., the DETC has published a handbook for accreditation of distance education institutions.

The survey only includes one distance learning university, the Open University in the UK. The OU has developed an extensive system for quality assurance of its own activities. However, in the external quality reviews carried out by the QAA, the OU is assessed using the same national quality criteria as other British institutions of higher education.

E-learning quality – ELQ

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 aspects above are not numbered in order of importance, but there is a rough sequence from the smallest elements of teaching/learning processes to an organisational, 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 organisational 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 (Connolly et al. 2005 & Horizon report 2007). In e-learning, course content is moving far beyond the printed book to an interactive multimedia environment, which blurs the

60. A reference list can be found in Appendix 3.

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 (Pavlik 2004). 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. Due to the enrichment of material, there is a need for new standardisation methods (Prpitsch & Veith 2006), to enable use and reuse of digital material in different virtual environments.

Freely available course content is produced by organisations and institutions[61] such as UNESCO[62], the Open University UK[63] and 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 (Moore and Kearsley 2005).

Online course content increasingly includes web/video lectures. Lectures are produced and broadcast by universities, individual teachers and students using open and easy-to-use Internet programs such as YouTube[65] and video blog programs.

It is no longer a given that course material is compiled by the teacher. In many cases, especially when dealing with complex media, a team of production experts is involved (E-xcellence 2007, Nätuniversitetet 2003). In some cases, learners have become the producers of their own learning material (Horizon report 2008). This raises question not only about the quality of the product but also about the production process.

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61. These are often called open educational resources and they stem from the open access tradition dealing with free access to scientific publications. Today there are over 3,000 journals providing free, full-text, quality-controlled scientific and scholarly material. www.doaj.org/ retrieved 2008-02-27.
62. http://opentraining.unesco-ci.org/cgi-bin/page.cgi?&p=about&d=1 retrieved 2007-11-17.
63. www.open.ac.uk/openlearn/home.php retrieved 2007-11-17.
64. http://ocw.mit.edu/OcwWeb/web/home/home/index.htm retrieved 2007-11-17.
65. www.youtube.com/.

Intellectual property rights (IPR) are another major concern when production is spread out and sometimes collaborative (Magjuka et al. 2005, Kidney et al. 2007). The main challenge of IPR is not in the complexity of the media; it is in the complexity of the production process. (Horizon report 2007).

Summary – Material/content

In e-earning, the course material/content can consist of both printed and digital material. Thus the selection, production and adaptation of course content are of major importance to the quality of e-learning. Course content can be produced by publishers, individual teachers or by a group of course developers. When dealing with complex digital media, a team of production experts is often needed. In some cases, learners have become the producers of their own learning material. The recycling of existing material available online and the fact that digital "originals" cannot easily be authenticated or distinguished from copies adds to the complexity of identifying an "author". The different production processes raise questions not only about the quality of the course material, but also about copyright.

Quality criteria:

a) Policy and guidelines for selection and production of digital material, including explicit pedagogical and technical criteria
b) Policy and guidelines for copyright issues
c) Known and implemented a) and b)
d) Internal evaluation and subsequent improvement of a), b) and c)

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 (E-xcellence 2007, ACODE 2006, Swedish National Agency 2007).

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] (Horizon report 2007 & 2008) In short, skilled users apply a mixture of programs in the virtual world to solve tasks and problems, and the use of these tools[68] involves informal as well as formal learning. Social technology is widely used, enabling collaboration and enhancement of social presence (Horizon report 2008).

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. There are many different terms for these computer programs, e.g. Learning Management Systems (LMS), virtual learning environments, course management systems and learning platforms. Learning platforms are currently developing towards more multimodal communication and integration of PDAs[69] and mobile phones (Horizon report 2008).

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 emphasise social presence and synchronous communication. Second Life[70], for example, is used for teaching mathematics (Caprotti & Seppälä, 2007) 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 avail-

66. RSS (Really Simple Syndication) is a method for publishing frequently updated content on the web.

67. A new generation of social networking systems that places people at the centre of the network (see further the 2008 Horizon report).

68. An example of how to combine different tools is given by David Delgado, a developer of learning systems and online communities at the CICEI (Innovation Center for the Information Society), University of Las Palmas de Gran Canaria, Spain. See David Delgado's blog http://eduspaces.net/davidds/weblog retrieved 2007-11-17.

69. Personal digital assistance: A hand-held electronic organizer or computer.

70. A three-dimensional online world http://secondlife.com/ 2008-01-20.

able virtual worlds, it is not easy for institutions to maintain control over quality.

The selection of tools and LMS influence the interaction between the learner and teacher on a course. The choice of LMS and additional software depends to no small extent on the teacher's level of proficiency in using the software effectively, more so than on the skills of young student generations. Lifelong learners from older generations generally need more preparatory training than younger students in how to use computers, the Internet and the specific software selected for a course. This issue of quality is discussed further under the "support" aspect below.

When using software without a contract and when the environment is provided by vendors, communities or private individuals, institutions have almost no control over quality, accessibility or usability. This issue is further dealt with under the "policy and institutional leadership" aspect below.

Summary – Structure/virtual environment

The virtual environment is one of the most dynamic and rapidly changing features of e-learning, so systematic improvement and updating are needed on a continuous basis.

The choice of virtual environment should be based on pedagogical considerations and the institution's technical environment.

Quality criteria

a) A virtual environment that is:
- selected on pedagogical needs
- reliable and robust
- aligned with the institution's technical infrastructure

b) Internal evaluation, updating and improvement of a)

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 & 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	**1. Technology–supported teaching** – Demonstration programs – Visual presentation programs	**3. Synchronous communication** – Video conference – Chat/Instant messaging – IP telephone – Whiteboard – Audio chat
Different time	**2. Technology–supported learning** – Self-studies (simulations, animations etc…)	**4. 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.

Summary – Communication, cooperation and interactivity

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.

Quality criteria

a) Explicit strategy for communication, cooperation and interactivity according to pedagogical needs, available technology and human resources
b) Implementation of a)
c) Evaluation and improvement of a) and b)

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 (Laurillard 2006).

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.

Other concerns include identification of students and plagiarism. The problem with identification is not new; within higher education, there is a long tradition of home assignments and issues of identification. The use of invigilation at learning centres and at other universities is commonly used to overcome the problem of secure remote assessment (Clarke et al. 2004 & Mills 2006). The use of web cameras, computer ID and finger scans are some examples of ways to overcome the identification problem in synchronous settings (Moore & Kearsley 2005). Identification is improved, as

is validating acquired knowledge, when live dialogues can be arranged. A multimodal approach to assessment provides many ways for students to communicate their knowledge - by using texts, digital productions, oral presentations and discussions individually or in groups. Such an approach also provides the teacher with the rich variety of information needed to assess the students' level of knowledge and skills. However, ambitious assessment procedures require more teacher time as well.

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 identification	Easy identification, moderate flexibility of location	Easy identification, moderate flexibility of time and location	High flexibility of location. Low costs for students, no travel, accommodation, etc. needed	High flexibility of time and location. Low costs for students, no travel, accommodation 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 identification concerns. But e.g. Internet banking services have well- developed systems for securing 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.

Summary – Student assessment

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.

Quality criteria

a) Strategy for fair, flexible and pedagogically justified assessment
b) Implemented policy for dealing with plagiarism, legal security and identification of students
c) Implementation of a) and b)
d) Evaluation and improvement of a) and b)

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 1 and 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 (Hansson & Holmberg, 2006). Increased flexibility requires the availability of content and communication tools across different wireless systems and independent of hardware (Ally, 2007).

Usability tests are conventionally limited to assessing the time it takes to complete a task, along with effort, throughput, flexibility, and the user's attitude. Kukulska-Hulme (2007) argue that we should move beyond technical usability criteria such as accessibility, consistency and reliability, and add "pedagogical usability", which includes factors such as learner control, learner activity, motivation and feedback. Pedagogical usability is partly discipline-specific – the functions required by language learners will differ from those required by students of physics, for example.

Mobile and platform-independent learning is closely related to the concept of ubiquitous computing: "As opposed to the desktop paradigm, in which a single user consciously engages a single device for a specialized purpose, someone 'using' ubiquitous computing engages many computational devices and systems simultaneously, in the course of ordinary activities, and may not necessarily even be aware that they are doing so."[71]

Summary – Flexibility and adaptability

Flexible features of course design include: where to study (location), when to study (time), study period (duration), study pace (full time/part time), language(s) of instruction and content, adaptation of methods to disabled people, number of people admitted (scope), individual studies and/or group-based studies. Increasing the flexibility of one feature may decrease that of another. Adaptation to target groups is necessary.

Quality criteria

a) Strategy for increasing the flexible features of education based on pedagogical considerations and students' needs and demands
b) Implementation of a)
c) Evaluation and improvement of a) and b)

6. Support (student and staff)

A large number of studies have shown that support is crucial for successful e-learning implementation. Andersson (2007) 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

71. Wikipedia: 2007-11-18; http://en.wikipedia.org/wiki/Ubiquitous_computing.

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 assignments, 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.

Summary – Support (students and staff)

Support to students and staff must encompass more than technical issues. In e-learning, social support is often regarded as equally, if not more, important. Teachers need support from librarians and guidance counsellors as well as from ICT consultants and administrators.

Quality criteria

a) Strategy for student support including technical, administrative and social support on demand
b) Strategy for faculty support including technical, ICT and information competence support on demand
c) Implementation of a) and b)
d) Evaluation and improvement of a), b) and c)

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 (modified from Laurillard, 2006):

- 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 on 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.

Summary – Staff qualifications and experience

Staff qualifications in, and experience of, e-learning are key factors for success. Not just teachers but all staff involved in e-learning need to acquire the necessary skills, and systematically update their knowledge and strategies.

Quality criteria

a) Strategy for staff competence development
b) Implementation of a)
c) Evaluation and improvement of a) and b)

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 ongoing, 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.

Summary – Vision and institutional leadership

A long-term vision for e-learning must guide current practice and establish a common goal for the institution. This vision needs to be regularly updated and revised. Promoting research, quality assurance and development at the institutional level generates knowledge and experience crucial for improved e-learning activities. National and international cooperation and strategic alliances are increasingly important.

Feedback, follow-up and strategic management from institutional administration encourage and support staff and students involved in e-learning initiatives.

Quality criteria

a) A strategy plan for e-learning with a visionary perspective, including research, quality assurance and development activities, and strategic local, national and international alliances related to short, medium and long term objectives
b) Implementation and evaluation of a) and b)
c) Feedback, follow-up and monitoring of national as well as international trends, and strategic management from the institutional administration

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 infrastructureStaff training in ICT Student and staff support (ICT and technical)Recruitmentsincreased planning, designingReorganisation of administration
Benefits	Low investment costs	New marketsWidening participationIncreased competitivenessLong-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).

Summary – **Resource allocation**

In e-learning, resources have to be reallocated from physical locations (lecture halls, libraries, administration offices) to technical infrastructures, support organisations and staff development. In blended education, both the technical infrastructure and physical localities need to be financed. Workloads and a shift in working hours for staff also have to be taken into account. The development of interactive content and online lectures require special financial resources as well as copyright regulations.

A new financial strategy will be needed for marketing e-learning in order to reach new target groups.

Quality criteria

a) A strategy for the reallocation of existing resources and the generation of new resources based on the specific needs of e-learning
b) A strategy and plan for dealing with changes in workload and working hours as well as with ownership of and financial rights to virtual lectures and other digital material
c) Implementation of a) and b)

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.

Summary – The holistic and process aspect

When implementing e-learning, it is important to adopt a holistic approach. The ten aspects of ELQ are part of a puzzle in which all the pieces have to fit together. When one part of the puzzle changes, e.g. technology, student behaviour, knowledge needs, society, finances or staff requirements, all other parts needs to be re-aligned accordingly.

Quality criteria

a) A functional and systematic approach for e-learning implementation encompassing all previously mentioned quality aspects:

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.

b) Internal evaluation, updating and improvement of a) using a holistic approach

Policy issues for quality assurance agencies

We have identified four major policy challenges for the National Agency and other quality assurance agencies to address when dealing with the assessment of quality in e-learning:

- Integration of e-learning criteria in the national quality assurance system
- Intelligence and competence within the organisation
- Cross-boundary education changes the conditions for quality assurance
- Methodological development

Integration of e-learning criteria in the national quality assurance system

The Swedish national quality assurance system includes five types of assessment components. Two of these deal exclusively with the quality of education: *evaluations of degree courses and programmes* and *appraisals of the entitlement to award degrees*. The quality aspects and quality criteria which form the basis of assessment in these two components have been synchronised. In principle, the National Agency applies the same aspects and criteria – the same basis of assessment – in both cases. Another assessment component can be found in the *audits of the quality assurance systems at higher education institutions*. A number of aspects and level-specific criteria have been established within the framework of this component which relate particularly to institutional conditions for educational quality.

The suggestions presented in this report about aspects and criteria to indicate the quality of e-learning are intended to serve as complements to the National Agency's general assessment basis. As our suggestions cover both the quality of the e-learning itself as well as the institutional conditions for such quality, they are relevant to all three assessment components above. Some of the aspects and criteria we propose should be added to existing aspects, while others are reinterpretations or adjustments of existing aspects and criteria.

Conclusion

In order for quality assessment of e-learning to become an integral part of national quality reviews, aspects and criteria need to be incorporated into the general basis for assessment. This requires intelligence and competence within the organisation.

Intelligence and competence within the organisation

The second challenge that we have identified relates to intelligence and competence within the organisation.

As this report has shown, the question of what constitutes e-learning is a complex one, and the answers are constantly changing. Technology evolves at breakneck speed, and new digital applications for educational purposes are constantly being introduced. Even as this report is being written, some of its contents are becoming outdated. At the same time, efforts are under way in various parts of the world to try to pin down and guarantee quality in e-learning. Some of that work has been described and analysed earlier in this report. The development of definitions and indicators of quality is taking place at government agencies and organisations, as well as within the framework of various networks and projects.

It is a challenge for any institution involved with quality in e-learning to stay abreast of both technological and pedagogical developments internationally and also ongoing quality assurance endeavours in the area. It is also important to keep track of national development work. But monitoring developments is not enough. Each agency's own quality assessments also need to be flexible and continuously updated to match these developments. Narrow quality aspects and criteria established one year run the risk of becoming irrelevant in the following year.

Conclusion

A special function for e-learning needs to be set up within the quality assurance agency, i.e. a function with the task of monitoring, on a continuous basis and under special regulations, national and international developments within e-learning.

To keep pace with international developments, we recommend the adoption of a strategy for extended representation in international organisations, projects and networks.

The establishment of an e-learning advisory board is also recommended.

Cross-boundary education changes the conditions for quality assurance

Another challenge faced by national assessment agencies is that higher education, when provided as online e-learning, is no longer necessarily national. The Internet and modern technologies allow universities to provide education globally regardless of physical location. Geographical borders do not limit ideas, and educational exchange between learners and universities takes place internationally. Joint education programmes between universities in different countries are increasingly common. The virtual mobility of teachers and students can rapidly change the educational landscape. The situation is further complicated by the fact that the rules and regulations of higher education in one country may not be applicable in another.

Conclusion

Knowledge exchange and cooperation between quality assessment agencies and organisations across national borders are necessary in order to harmonise and safeguard quality assurance strategies and policies.

Methodological development

Another strategic challenge, possibly the greatest one of all, is the methodological development that quality assessment of e-learning will require.

The Swedish National Agency's evaluations of degree courses and programmes are designed methodologically in accordance with international

practice: HEI departments produce self-evaluations to provide the basis for external reviews. The external reviews are performed by expert panels. Site visits are also conducted, during which the expert panels interview management, teachers and students. The assessments are summarised in a public report.

Adaptation and development work are required if this assessment model is to apply to e-learning.

In e-learning, for example, the learning processes take place in different physical and digital settings, and therefore it is not always easy to identify a suitable physical campus for site visits.

Assessment of the digital learning resources and digital environments is another challenge: a few years ago, e-learning was distributed by e-mail and learning management systems. Today the diversity of the virtual learning environment is far greater. Programmes may be distributed in virtual worlds, and by web/video conferences. The benchmarks/criteria used for assessing one form of distribution sometimes have no relevance to other forms. While the assessment of digital applications implies difficulties for the assessors, they also offer novel opportunities for them to reach the heart of teaching and learning, as many of the educational environments are more easily accessible.

In the external evaluation of degree courses and programmes, external expertise is needed not only in the subject area, but also in teaching and learning. In e-learning in particular, the experts also need to master new digital media and new virtual forms of delivering education. The training of experts in the QA system used in general, and e-learning criteria in particular, is essential.

Conclusion

Extensive methodological development will be necessary to adapt the general methods for assessment of quality in higher education to the assessment of quality in e-learning.

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Appendix 1

Summary of E-xcellence (EADTU) Benchmarks

Strategic management includes policy and plans for infrastructure, virtual mobility, collaboration and research and innovation in e-learning

Curriculum design. The design benchmarks focus on maximum flexibility for the learner and clarification of the objectives for using e-learning components in blended learning. It is also stated that curriculum design requires broad participation in online communities both for students and teachers. "The challenge that an institution faces is that of designing curricula that combine the flexibility in time and place of study without compromising standards of knowledge and skills"

Course design should foster interaction between student-material, student-student and student-teacher. The design should also recognise the diversity of learners and make appropriate provision for disabled persons. It is further stated that courses should have clear statements of learning outcomes and include both formative and summative assessments. Course material should be up-to-date and guidelines concerning layout and presentation should be consistent. The need for diverse competencies in the design, development and evaluation process is emphasised.

Course delivery covers the technical aspect of the course. The IT infrastructure should be suited to purpose, and reliability and security should be rigorously tested. The VLE should be as integrated as possible with the institution's management information system and appropriate for the pedagogical model used.

Staff support; "The objective of all support services is to enable all members of academic and administrative staff to contribute fully to e-learning development without demanding that they become ICT or media specialists in their own right." This area also includes benchmarks concerning staff workload, adequate administrative support and handling of intellectual property **rights**

Student support; It is, in a broad sense, divided into two areas: access to resources and information. Access to resources is further divided into learning resources, library, help desk, student handbook, advice and counselling. Information to prospective and in-house students should give a

clear picture of the expectations that will be placed on them, especially in terms of their participation in online learning communities.

The Quality framework of SEEQUEL

1. Learning sources
- Supporting staff
- Teaching staff
- Learning materials
- Learning infrastructure

2. Core learning processes
- Guidance/training needs analysis
- Recruitment
- Learning design
- Learning delivery
- Evaluation of the course
- Assessment of the learners

3. Learning context
- Institutional setting
- Cultural setting (national, organisational, professional, general)
- Learning environment
- Legislation
- Financial setting
- Value systems

Summary of UNIQUe Guidelines

Learning resources
- Resources for learning
- Students
- Faculty (teachers)
- Technological equipment

Learning processes
- Quality of the offering (e.g. catalogues and services, learning organisation)
- Intellectual property rights (IPR) management

- Personal development/HR development + services

Learning context/institution
- Commitment to innovation, (culture, R&D)
- Institutional standing, (e.g. context and mission, background and experience, reputation in the e-learning community)
- Openness (e.g. access, connections with the corporate world, contribution to the community, international issues)

Cedefop guidelines

- Learners must play a key role in determining the quality of e-learning services
- Europe must develop a culture of quality in education and training
- Quality must play a central role in education and training policy
- Quality must not be the preserve of large organisations
- Support structures must be established to provide competent, service-oriented assistance for organisations' quality development
- Open quality standards must be further developed and widely implemented
- Interdisciplinary quality research must become established in the future as an independent academic discipline
- Research and practice must develop new methods for interchange
- Quality development must be designed jointly by all those involved
- Appropriate business models must be developed for the services in the field of quality.

Appendix 2

Quality matrix developed by NADE (author's translation from Norwegian)

Table: Quality matrix

	Prerequisite	Implementation	Results	Follow-up
Information and guidance counselling	External prerequisites Organisation partners	Content Channels	Recruitment Non recruited Society	Evaluation Customer reaction
Course development	External prerequisites Organisation Target group Staff Partners	Control Cooperation Evaluation, Guidance of authors Choice of media Evaluation of product	Curriculum Demand for material (educational, language and professional) Support material	Evaluation Customer reaction Revision and updates
Teaching and learning	External prerequisites Organisation Participants Material Teachers Partners	Communication Teaching and learning Study counselling Assessment documentation	Learning outcomes Retention Target Achievement	Evaluation Customer reaction
Organisation	External prerequisites Organisation Quality system Partners	Management Communication Future orientation	Target achievement Economy Reputation	Evaluation report

QAA guidelines

Guidelines for quality assurance of distance learning

The QAA guidelines refer to certain distinguishable aspects that are commonly found under varying labels as components within systems of distance learning:

- *Materials-based learning*. This dimension of a distance-learning system refers to all the learning resource materials made available by the programme provider to students studying at a distance.
- *Programme components delivered by travelling teachers*. This dimension refers to the staff of the providing institution who travel on a periodic basis to the student's location to deliver components of the programme.
- *Learning supported locally.*

- *Learning supported from the providing institution that is remotely located from the student.*

The terms set out above refer to dimensions that are common components within systems of distance learning, but for which there are no uniform labels.

The guidelines comprise four areas.

1) System design - the development of an integrated approach
2) The establishment of academic standards and quality in programme design, approval and review procedures
3) The assurance of quality and standards in the management of programme delivery
4) Student development and support

Guideline 1: System design - the development of an integrated approach

Precepts

- Higher education by distance learning should be underpinned by principles that are generally relevant to higher education. An institution that aims to offer distance learning programmes of study should design and manage its operations in a manner that applies those principles and, at the same time, takes full account of considerations that are specific to teaching its students at a distance.
- The provision of programmes of study by distance learning should form part of an explicit strategy for achieving an institution's stated aims, and the distance learning system or systems should be designed and developed in ways that reinforce the strategy.
- Prior to offering programmes of study by distance learning, an institution should explicitly design and test its system for administering and teaching students at a distance and plan for contingencies in order to meet its stated aims in terms of academic quality and standards.
- An institution should safeguard its position in respect of the legislation in any country in which its programmes of study are proposed to be made available by distance learning.
- A providing institution's plans for offering programmes of study by distance learning should be financially underwritten for the full period during which students will be studying the programmes, and at a level that safeguards the quality and standards to which the institution is committed.

Guideline 2: The establishment of academic standards and quality in programme design, approval and review procedures

Precepts

- The providing institution is responsible for ensuring that programmes to be offered at a distance are designed so that the academic standards of the awards will be demonstrably comparable with those of awards delivered by the institution in other ways and consistent with any relevant benchmark information recognised within the UK. In designing distance learning programmes of study, and any component modules, a providing institution should ensure explicit and reasoned coherence between the aims and intended learning outcomes on the one hand, and the strategies for teaching at a distance, the scope of the learning materials and the modes and criteria of assessment on the other.
- A providing institution is responsible for ensuring that the design of distance learning programmes of study provides learning opportunities which offer students a fair and reasonable chance of achieving the academic standards required for successful completion.
- A providing institution should have processes for approving distance learning programmes of study which, while underpinned by principles relevant to all educational programmes, take specific account of the requirements of the system of distance learning that have been adopted as well as of the opportunities provided for scrutiny.
- A providing institution's processes for approving programmes of study, and any component modules, should include an element of scrutiny external to the institution.
- Once designed and in use, an institution should ensure that programmes of study and component modules are monitored, reviewed and subject to re-approval regularly. Institutions should particularly ensure that the content of all learning materials remains current and relevant and that learning materials, teaching strategies and forms of assessment are improved in the light of feedback results.

Guideline 3: The assurance of quality and standards in the management of programme delivery

Precepts

- The providing institution is responsible for managing the delivery of each distance learning programme of study in a manner that safeguards the academic standards of the award.

- The providing institution is responsible for ensuring that each distance learning programme of study is delivered in a manner that provides, in practice, a learning opportunity which gives students a fair and reasonable chance of achieving the academic standards required for successful completion.
- Learning, although at a distance, should be treated as an activity that involves all participants in the system, and as an activity in which monitoring, review and feedback are regularly used to enhance all components of teaching, learning and the system of delivery.

Guideline 4: Student development and support

- In respect of students taught at a distance, a providing institution should give explicit attention to its responsibility for supporting and promoting autonomous learning and enabling learners to take personal control over their own development. An institution should set realistic aims, devise practical methods for achieving them, and monitor its practice.
- A providing institution should meet the needs of its students who are studying at a distance by providing information that is particularly thorough and clear as regards the nature and expectations of their programme of study including the relationship between achievement and assessment, academic progress and accumulation of credit as well as the characteristics of the distance learning system and how students interact with it. The provided information should be conveyed in a manner that enables students to make informed decisions about their own education, and to monitor their progress against clear expectations of achievement.
- A providing institution should monitor the effectiveness of information provided to students and, in light of its findings, take steps to improve its provision.
- An institution should determine what means of student representation are appropriate and realistic for students on distance learning programmes of study as well as provide these students with accurate information about representation.

Summary of ACODE Benchmarks

1) *Institution policy and governance for technology-supported learning and teaching.* This topic area deals with planning, policy and implementa-

tion at institutional level in relation to the application of technologies for learning and teaching.

2) *Planning for and quality improvement of the integration of technologies for learning and teaching*. This includes quality assurance, implementation, evaluation and allocation of resources.

3) *Information technology infrastructure to support learning and teaching.* The third benchmark pertains to the software and hardware used on and off campus. "…learning management systems; library systems; the World Wide Web; mobile technologies. It also includes hardware (computers, telecommunications and ancillary equipment) and networks…which are used for the purposes of learning and teaching" (p. 10). The chosen technology should be robust and managed efficiently and effectively with clearly defined responsibilities and processes.

4) *Pedagogical application of information and communication technology.* Pedagogical application should be: a) **Aligned** to institutional learning and teaching strategy; b) **Informed** by good practice and educational research; guidelines available to all staff c) **Supported** adequately; opportunities for professional development, for example by communities of practice, d) **Deployed** and promoted effectively; assurance that resources are allocated to developing e-learning projects and that the pedagogical application of ICT is sustainable, and e) Evaluated from a number of perspectives.

5) *Professional/staff development for the effective use of technologies for learning and teaching.* Quote, page 18: "Quality learning and teaching are engendered where people are expert, enthusiastic, skilled and well supported and learning experiences are designed to engage the learner, employing multi-modal approaches…"
"..Engagement in project development should not be limited by factors of physical location, equity or technological skills. This means that professional staff development is offered flexibly, accommodates a range of entry points"
"A good practice approach to learning and teaching technologies reflects an understanding of learners' characteristics and needs as required by different discipline contexts"

6) *Staff support for using technologies for learning and teaching.* Support needs to be identified and organised for individuals as well as work groups and disciplines.

7) *Student training for effective use of technologies for learning.* This is closely related to benchmark 6 and 8. It is important to educate staff in order to provide this support.

8) *Student support for the use of technologies for learning.* Support for students in using technologies for learning is defined as primarily technical, but the learning context should be considered

Summary of CHEA Benchmarks

1. *Institutional mission*; This includes alignment between mission and distance learning programmes and that there is a documented need for the programmes.
2. *Institutional organization structure*; This area deals with issues such as whether the institution has a suitable organization for distance education. How well organization for distance programmes is integrated with the overall organization is also of interest.
3. *Institutional resources*; raises the questions of whether the institution allocates enough funding to sustain good quality distance education.
4. *Curriculum and instruction*: Several QA organisations have emphasised that content must be consistent with the content used in on-campus programmes. Utilised technology must also be appropriate for the course.
5. *Faculty support*; this area focuses on recruitment of qualified instructors/teachers as well as the importance of ongoing programmes for staff technology training.
6. *Student support*; this support mainly concerns technical support, but it also concerns ICT issues such as community building. Validation of prior skills and competencies as well as assessment of self-motivation and commitment are also referred to.
7. *Student learning outcomes*; There was a major increase in the attention given to learning outcomes in the 1990s in the U.S. outcomes must equal the outcomes of on-campus programmes.

Topical areas of DECT

1. Institution mission, goals and objectives
2. Educational programme objectives, curricula and materials
3. Educational services
4. Student services
5. Student achievement and satisfaction
6. Qualification of institution, owners, governing board members, administrators, instructors/faculty and staff
7. Admission practices and enrolment agreements
8. Advertising, promotional literature and recruitment
9. Financial responsibility
10. Tuition policies, collection procedures and refunds
11. Plant equipment and record protection
12. Research and self-improvement

Appendix 3

Quality criteria discussed in the twenty most recent articles (2007) from The International Review of Research in Open and Distance Learning (IRRODL) and the 13 most recent articles (2006–2007) from The European Journal of Open and Distance Learning (EURODL). Each article often discusses more than one criterion.

Material/Content (12 articles)

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Structure/virtual environment (25 articles)

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Appendix 4

List of abbreviations

- ACE – Danish Council for Accreditation
- ACODE – Australasian Council on Open, Distance and E-learning
- AUCC – Association of Universities and Colleges of Canada
- AUQA – Australian Universities Quality Agency
- CEDEFOP – European Centre for the Development of Vocational Training
- CHEA –Council for Higher Education Accreditation (USA)
- DECT – Distance Education and Training Council (USA)
- EADTU – European Association of Distance Teaching Universities
- EDEN – European Distance and E-learning Network
- EFQUEL – European Foundation for Quality in eLearning
- ENQUA – European Association for Quality Assurance in Higher Education
- EURODL – European Journal of Open and Distance Learning
- EVA – Danish Evaluation Institute
- EQM – European Quality Mark
- EQO – European Quality Observatory
- FINHEEC – Finnish Higher Education Evaluation Council
- FVU – Finnish Virtual University
- ICDE – International Council for Open and Distance Learning
- IRRODL – International Review of Research in Open and Distance Learning
- HEA – Higher Education Academy (United Kingdom)
- HELIOS – Horizontal E-learning Integrated Observation System
- HSV – the Swedish National Agency for Higher Education
- JISC – Joint Information Systems Committee (United Kingdom)
- NADE – Norwegian Association for Distance Education
- NOKUT – Norwegian Agency for Quality Assurance in Education
- NOU – Norway Opening Universities
- NQA – the Netherlands Quality Agency
- NSHU – the Swedish Agency for Network and Cooperation in Higher Education

- NVAO – The Accreditation Organisation of the Netherlands and Flanders
- NVU – Norwegian Networked University
- OU – Open University (United Kingdom)
- QAA – Quality Assurance Agency for Higher Education (United Kingdom)
- QANU – Quality Assurance Netherland Universities
- SEEL – Supporting Excellence in E-learning
- SEEQUEL – Sustainable environment for the evaluation of quality in e-learning
- UNIQUe – European University Quality in eLearning