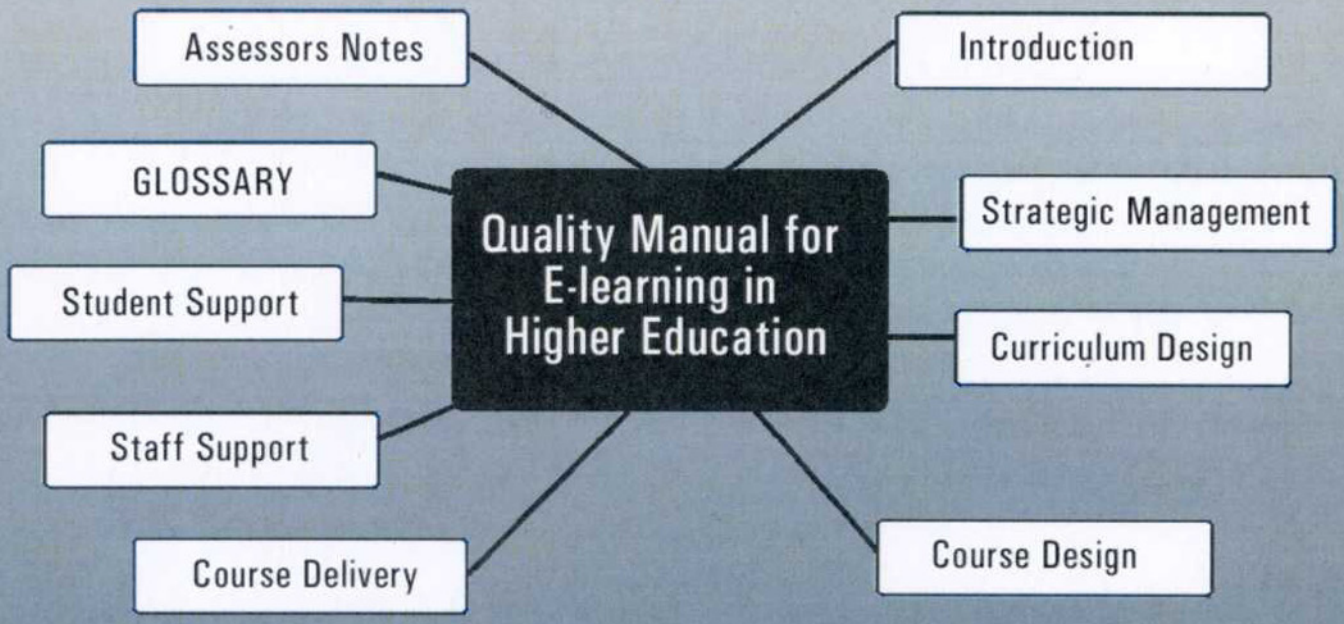
E-xcellence

BENCHMARKING TOOL FOR QUALITY ASSESSMENT IN E-LEARNING

Quality Manual for E-learning in Higher Education



www.eadtu.nl/e-xcellenceqs

Quality Manual for E-learning in Higher Education

Introduction 4
1 Strategic Management 7
1.1 Policies and Plans 7
1.2 The role of e-learning in academic strategy 8
1.3 Policy on infrastructure 8
1.4 Policy on virtual mobility 9
1.5 Collaborative ventures 10
1.6 Research and innovation in e-learning 10
2 Curriculum Design 17
2.1 Flexibility 18
2.1.1 Time and Pace 18
2.1.2 Place 19
2.1.3 Blended Learning 19
2.2 Modularity 20
2.2.1 Navigation 20
2,2,2 Credit Transfer 21
2.3 Academic Community Development 21
2.3.1 Student-student, student-teacher 22
2.3.2 Connectivity with non-campus professionals and professions 23
2.3.3 Research Involvement 23
2.4 Knowledge and Skills 24
2.4.1 Transferable skills 25
2.4.2 Professional and vocational 26
2.5 Assessment procedures 26
2.5.1 Formative assessment 26
2.5.2 Summative assessment 27
3 Course Design 31
3.1Pedagogic Design 32
3.1.1 Pedagogic Strategy 32
3.1.2 Pedagogical blended model 33
3.1.3 Mentored e-learning model 33
3.1.4 Self-Study Materials 34
3.2 Course design 35
3.2.1 Relationship with Curriculum 35
3.2.3 Analysis 36
3.2.4 Content Criteria 37
3.3 Materials and production design 38
3.3.1 Technical design 38
3.3.2 Interface 39
3.3.3 Content Criteria 40
3.3.4 Process management 41
3.4 Assessment and Evaluation 42
Indicators 44
4 Course Delivery 63
4.1 Technical Infrastructure 64
4.1.1 System Design and architecture 64
4.1.2 Technical Infrastructure 65

4.2 Virtual learning environment 65
4.2.1 Learning Platforms and Management Systems 66
4.2.2 e-Learning Materials 67
4.2.3 Information Requirements 67
4.2.4 Updating and revising the e-learning system 68
4.2.5 On-line assessment 69
4.2.6 Physical distribution 70
5 Staff Support 77
5.1 Technical 77
5.1.1 Technical support (ICT) 78
5.1.2 Training support 78
5.2 Pedagogic 79
5.2.1 Pedagogic support 79
5.2.2 Pedagogic development 80
5.3 Resources 80
5.3.1 Information and Media support 81
5.3.2 Administrative Support 81
5.3.3 Career development 82
6 Student support 88
6.1 Technical 89
6.1.1 Online availability 89
6.1.2 Technical Support and Helpdesk 89
6.2 Pedagogic 90
6.2.1 Analysis of support needs for different user groups 90
6.2.2 Pedagogic guidance 90
6.3 Resources 91
6.3.1 Library and information sources 91
6.3.2 Learner communities 92
6.3.3 Developing e-Learning skills 92
6.3.4 Role of study centres 93
6.4 Staff Resources 93
6.4.1 Resource planning. 94
6.4.2 Role Definitions 94
6.4.3 Administrative support 94

Introduction

The European Association of Distance Teaching Universities - EADTU - is Europe's leading association for *Lifelong Open and Flexible (LOF) learning in distance Higher Education (HE).* (www.eadtu.nl). As well as e-learning, the model of LOF learning embraces the characteristics of open learning, distance learning, online learning, open accessibility, multimedia support, virtual mobility, learning communities, dual mode (earn & learn) approaches, and the like.

The focus of this manual is Quality Assurance for e-learning in Higher Education. It is the main product of a two-year project entitled E-xcellence, undertaken under the auspices of EADTU and involving a pool of experts from 12 European institutions with a stake in e-learning developments (see below).

Quality Assurance in HE has received much attention at the institutional, national and European level through validation centres, universities (and their umbrella organisations), quality agencies, national ministries of education and the like. These have established systems to cover the full organisational and content-related quality assurance of HE institutions and their programmes. However, few of these systems have so far developed a focus on the parameters of quality assurance governing e-learning. This has therefore been the objective of the E-xcellence project.

It has not been the intention of the project to interfere in any way with existing systems of quality assurance, and this manual is not a comprehensive guide to QA procedures even in the context of "pure" e-learning provision. It is assumed that institutions and regulatory bodies will have a defined set of processes which provide for the development, monitoring, evaluation and enhancement of HE provision. This manual offers a supplementary tool which may be used with these QA processes to allow the consideration of e-learning developments as a specific feature. An important aspect of the E-xcellence project is that it offers a European-wide standard, independent of particular institutional or national systems, and with guidance to educational improvement.

Partners

European Association of Distance Teaching Universities (EADTU)

The Open University (OUUK)

Open Universiteit Nederland (OUNL)

University of Oulu (OULU)

Centre National d'Enseignement à Distance (CNED)

Universitat Oberta de Catalunya (UOC)

Universidad Nacional de Educación a Distancia (UNED)

Estonian Information Technology Foundation (EITSA)

National Council for Distance Education (APERTUS)

Network per l'Universita Ovunque (NETTUNO)

European University Association (EUA)

The eLearning Industry Group (eLIG)

Nederlands-Vlaamse Accreditatie Organisatie (NVAO)

Purpose of the manual

The primary purpose of the manual is to provide a set of benchmarks, quality criteria and notes for guidance against which e-learning programmes and their support systems may be judged. The manual should therefore be seen primarily as a reference tool for the audit, assessment or review of e-learning programmes and the systems which support them.

However, the manual should also prove to be useful to staff in institutions concerned with the design, development, teaching, assessment and support of e-learning programmes. In providing a set of benchmarks, quality criteria and notes of guidance it is hoped that course developers, teachers and other stakeholders will see the manual as a useful development and/or improvement tool for incorporation in their own institutional systems of monitoring, evaluation and enhancement.

Context

It is intended that the manual will be relevant to a wide range of e-learning contexts, including blended as well as pure provision. Where e-learning is offered alongside other forms of learning as part of an integrated or blended learning programme it is important that the evaluation of these components takes place alongside those delivered by other means so that the relative merits of different teaching/learning approaches and the role of e-learning in overall provision can be determined. A set of performance indicators, both qualitative and quantitative, chosen to reflect the effectiveness of the programme as a whole, need to be employed.

One of the characteristics of an e-learning environment is the sheer amount of monitoring information which may be made available relative to more traditional methods of learning. Most e-learning platforms provide for an extensive level of monitoring and feedback, and student learning behaviour is usually more easily tracked and recorded in an e-learning context than in a traditional classroom. Also, external reviewers are able to gain access to the full range of course materials and to sample the delivery of the programme directly. This has obvious advantages for evaluation but also certain potential disadvantages associated with the sheer volume of data and opinion available. It is hoped that by focussing on specific benchmarks and criteria, institutions will be able to develop performance indicators which are fit for purpose in their own context.

Feedback

Integral to the E-xcellence project is the piloting and testing of the manual against three e-learning programmes across the contributing organisations between July and October 2006. The final version of the manual will be published following the outcomes of these pilots.

EADTU is also committed to supporting the continuous improvement of e-learning programmes and intends to produce a web-based supplement to the quality manual giving examples of good practice identified by contributing organisations. EADTU therefore welcomes feedback from any organisation which may be able to contribute to the good practice guide.

Organisation

The manual is organised into six sections covering Strategic management, Curriculum design, Course design, Course delivery, Staff support and Student support. Each section follows a similar format setting out benchmarks, critical factors, performance indicators, and assessors notes. It is intended that the benchmarks provide a set of general quality statements covering a wide range of contexts in which programme designers and others work. The critical factors and performance indicators develop from these benchmarks and cover particular aspects of the topic in question. Not all the critical factors will be relevant in all situations. The assessors notes provide a more detailed account of the issues and the approaches which might be taken to meet requirements in each situation.

1 Strategic Management

Benchmarks

1 The institution should have e-learning policies and a strategy for development of e-learning that are widely understood and are integrated into the overall strategies for institutional development and quality improvement. Policies should include both infrastructural and staff development

2 The resourcing of developments in e-learning curricula should take into account any special requirements for (*inter alia*) equipment purchase, software implementation, training of staff and technology developments, over and above the normal requirements for (non-e) curricula.

3 The institution should have a management information system which is reliable , secure and effective for the operation of the e-learning systems adopted.

4 When e-learning involves collaborative provision the roles and responsibilities of each partner should be clearly defined through operational agreements and these responsibilities communicated to all participants.

1.1 Policies and Plans

The institution should have defined policies and management processes that are used to establish strategic institutional objectives, including those for the development of e-learning. An institutional strategic plan will be the uppermost tier in a planning hierarchy and will shape the plans of academic, administrative and operational units of the institution. The strategic plan will be regularly monitored, evaluated and revised in line with experience and developing requirements.

The strategic plan should encompass a vision for the use and development of e-learning within the institution and provide a timescale for the achievement of strategic goals.

The strategic plan should address the provision of the human, technical and financial resources necessary for implementation.

Due account should be taken of key strategic issues such as relationships with other institutions, funding and regulatory bodies.

Indicators

At threshold level:

The institution will have an identified group of key staff responsible for formulating, evaluating and developing institutional policies and plans relating to e-learning. These policies and plans are set out clearly for the benefit of all participants.

At excellence level:

There is a widespread understanding of the role of e-learning within the institution and an institution-wide engagement with the development of policies and plans for its achievement and enhancement.

1.2 The role of e-learning in academic strategy

The Institutional strategic plan should identify the roles that e- learning will play in the overall development of the institution and set the context for production of the plans of academic departments, administrative and operational divisions.

The institutional plan will outline options for the use of e- learning in teaching that may define a spectrum of "blends" of e-learning and more established pedagogic mechanisms.

The institutional strategic plan should ensure that plans of academic departments are consistent with each other. Student mobility between departments should not be restricted by major differences in policy or implementation with respect to e-learning.

Faculty and departmental plans should aim to best match the student requirements of their particular market sector in presenting e-learning/blended learning options.

Indicators

At threshold level:

The e-learning strategy is part of the general educational strategy of the institution and there is consistency between the approaches to e-learning taken by individual departments and faculties in line with institutional plans.

At excellence level:

There is a widespread understanding of and engagement with the implementation of e-learning policies across the institution.

1.3 Policy on infrastructure

Institutions developing and delivering e-learning programmes will have a comprehensive set of policies that relate to the provision of an effective infrastructure for delivery of teaching materials and student support services.

The policies will address issues of :

- Financial, physical and technical resources
- Staffing and staff development
- Management, responsibility and accountability.

Implementation of e-learning may require an institution to review and revise its policies on the deployment of resources to ensure that it has in place an adequate technical and physical infrastructure.

The administrative aspects of e-learning programmes may require significant changes in administrative systems to enable students to access information

regarding their status, progress, *etc* on- line. Equally the "system" must have the capability to distribute appropriate materials to students. To meet these needs the institution must ensure that its management information system is capable of operation to appropriate standards of reliability, security and effectiveness.

Indicators

At threshold level:

Departmental and faculty plans address issues of resourcing, staffing and staff development for those involved in delivery and support functions.

Appropriate operating and security standards for all aspects of the provision of on-line services are defined.

At excellence level:

Institutional plans make provision for the resources necessary to install and maintain the physical and technical infrastructure needed and allocate responsibility for the delivery of services to specific departments.

Resourcing plans embrace both initial investment in equipment, software, *etc* and also set appropriate targets for cycles of updating, renewal and replacement.

1.4 Policy on virtual mobility

E-learning provides opportunities for presenting programmes that offer considerable flexibility in terms of place and time of study and equally provides opportunities for students and staff to participate in virtual communities.

Programmes encouraging the physical mobility of students are commonplace and receive considerable support from agencies such as the EU. The development of policies that facilitate virtual mobility is desirable for institutions operating e-learning programmes.

Policies for virtual mobility should be designed to provide students with opportunities to study programmes from institutions geographically remote from the student's home base and across national boundaries.

Institutions participating in virtual mobility programmes should develop policies that embrace academic, professional and social aspects of student mobility.

Institutions participating in virtual mobility programmes should ensure that assessment of student outcomes is consistent, well documented and interchangeable between institutions. Wherever possible student performance on a virtual mobility programme should be recognised for the purposes of an award of the home institution in the same way as for other programmes.

Indicators

At threshold level:

The institution has recognised the potential benefits as well as the problems of e-learning for virtual mobility and has a written policy on virtual mobility.

At excellence level:

There are exchange agreements with other educational institutions providing e-learning programmes and inter-operabilities have been agreed and set out with these providers.

The institution evaluates the virtual mobility policy and its results regularly

1.5 Collaborative ventures

The infrastructure and developmental costs of e-learning may create circumstances in which collaboration with other institutions provides an attractive route for the development and delivery of e- learning.

The development of collaborative ventures, whether initiated through top-down or bottom-up processes should be formally agreed and ratified prior to the course design stage.

Contractual arrangements between the collaborating partners should define the scope of the collaboration, the responsibilities of partners, financial arrangements and the relationships with third parties particularly students and teachers.

All collaborative ventures should be subject to stringent risk analysis and appropriate contingency planning should be in place in the event of the collaboration breaking down.

Indicators

At threshold level:

All collaborative ventures are formalised through contractual relationships.

Service level agreements are in place for all collaborative arrangements

Clear reporting lines exist for all those employed in collaborative ventures

Contigency plans to protect student and institutional interests are in place for each collaborative arrangement

At excellence level:

A risk analysis is conducted on each potential collaboration

1.6 Research and innovation in e-learning

Policies on research and innovation in e-learning need to cover both technical and pedagogical aspects.

While not all institutions with e-learning programmes will be in a position to conduct fundamental research into these areas, institutional management needs to ensure that there is a clear policy framework through which new developments and emerging techniques may be identified, evaluated and adopted.

Indicators

At threshold level:

There is a policy framework and an agreed set of planned activities directed towards the improvement of e-learning programmes through more effective use of technology, improved pedagogical approaches, *etc.* These activities will be linked in with the institution's processes for continuous improvement based on monitoring, feedback and self- evaluation but will also take account of developments elsewhere given the rapid pace of progress in e-learning and its applications.

At excellence level

The institution has a research and innovation policy which supports the development and/or evaluation of new technical/pedagogical approaches to e-learning, and a planned programme of activities in support of the policy. These activities may be decided by the needs of the institution's own e-learning programes but will usually be of relevance to e-learning programmes at other institutions and the results published accordingly.

Assessors notes for strategic management

Policies and plans

Delivery of e-learning is more dependent on collaborative working across departmental boundaries and on the provision of technical infrastructure than conventional face to face teaching. Though institutions may have embraced the use of information and communications technologies in the delivery of their conventional programmes provision of e-learning will require the formulation of a strategic framework at institutional level.

Several studies have revealed that in many institutions the development of e-learning has been driven by initiatives pursued at departmental or even individual level and not as a result of institutional policies. However for effective growth such initiatives must be sensitively integrated within an overall strategic framework.

Strategic Policies must indentify the role that e-learning will play in the institutional mission: for example, to address new student populations, to teach and develop skills appropriate to new developments in the world of work, to improve the effectiveness and efficiency of teaching programmes.

The flexibility in time and place of study offered by e-learning offers institutions the opportunity to address new student markets. For example e-learning may be identified as a contributor to growth of part time student numbers or ,as a mechanism to reach students beyond their current geographic reach, as a contributor to an institution's international policies.

The introduction of e-learning may be seen as a disruptive intervention to the status quo by some staff of the institution hence the processes of policy development should be inclusive.

A narrative description or organsational timeline of e-learning development may provide evidence of precursor activity prior to the formulation of institutional policy. Development of institutional policy should demonstrate that it incorporates the experience gained by internal pioneers within a broader analysis of sector-wide initiatives and models for e-learning delivery.

The strategic plan address academic, administrative and operational aspects of e-learning and should communicate the interdependence between the various aspects and present mechanisms by which the decisions will be taken and implemented on the allocation of resources to achieve changes in systems and procedures.

Institutional policy may introduce working with partner institution, a consortium of institutions or with commercial organisations as a component of its strategy. There should be clear evidence of a communication strategy that informs staff of the rationale for the partnership arrangements and the processes established to secure effective working relationships between the staff of the institution and their counterparts within the partner organisations.

Time is a key resource, realistic time scales for implementation of policies may be a key factor to successful acceptance of and compliance with an institutional plan.

Role of e-learning in academic strategy

The insitution's e-learning strategy provides the overall institutional rationale but academic departments will develop interpretation of the policy for implementation particular to their academic domain and student market sector. They must act as intermediaries between institutional objectives and the reality of student aspiration and requirements.

Academic decision makers will be presented with a range of pedagogic and technical options that variously emphasise the contribution of Information and communications technologies may make to the provision of teaching materials, academic resources and communication/collaboration between participants in a learning community.

The reality is that the majority of programmes will exploit several aspects of e-learning within some form of blended provision that may also encompass some face to face provision. Whatever the mix departments should be able to demonstrate how it provides the best fit with student requirements within the framework facilitated by institutional policy.

In development of their strategy it is to be expected that academic departments will be informed by feedback from experimental activity within the department, within other departments in the institution and other national and international developments. Departmental managers should use, with sensitivity, those involved in innovative projects to stimulate discussion and motivate their colleagues in the development of departmental strategy.

In those departments that provide programmes related to professional recognition there should be evidence of consultation over the use of ICT for professional purposes that must be catered for in programme design. Similarly resolution of issues related to the acceptability of ICT based teaching to professional bodies should be addressed up front to ensure that students may have confidence in the marketability of their qualifications.

Departments should address issues impacting on the relationship between their plans and those of other departments. Content and coverage of courses, introduction of e-based study skills are issues that might affect existing shared programmes or mutual recognition arrangements.

Institutional strategy may be for development of programmes in partnership with another institution or as part of a consortium. For a whole range of reasons faculty or departmental staff may not be as receptive to the requirement for collaborative working as those guiding institutional policy. Departmental managers may have difficulties in gaining full acceptance of the need for, and the benefits of, collaborative development.

E-learning may demand closer working relationships between academic units and the institution's administrative and operational divisions. Faculty and departmental plans should indicate the demands that they will place on services provided by other departments. Discussions on variations that may be needed to standard institutional services, should be identified in departmental planning and plans should allow appropriate time scales for the resolution of difficulties.

It is unlikely that any institutional strategy will cater for the circumstances of all departments without challenge at departmental level or pleas for exception or variation. Assessors might wish to explore how the institution manages the tensions

to ensure that institutional strategy secures efficiency without suppressing the inevitable pressure for innovation in a rapidly developing field of activity.

Policy on Infrastructure

The introduction of e-learning programme may impose new requirements for the institution to provide on-line administrative services and a technical infrastucture system designed to provide secure services accessed by users operating outside an institutional firewall.

The institution should undertake a full analysis of its requirement and of the options available to meet the requirements.

An extensive investment programme for the acquisition and implementation phase may be foreseen but the financial planning associated with e-learning should also cater for reinvestment to cover renewal and updating costs at realistic intervals.

A full appraisal of all options for infrastructure provision should be undertaken so that options such as outsourcing are fully considered.

Institutions may be able to secure support from national agencies in undertaking these tasks and thus be in a position to benefit from the experience of other institutions and the support of dedicated professional staff.

The provision of on-line services may require greater formalisation of procedures and interdepartmental relationships than required hitherto when communication between departments operated by traditional communication routes and informal networks.

It is envisaged that policies on infrastructure provision are more readily driven in a top down manner that other aspects of programme design. Hence assessors might expect to find that policy development and project management of infrastructure aspects will be managed according to processes encountered in the commercial world.

Policy on Virtual Mobility

Delivery of programmes via e-learning offer new opportunities for achieving the objective of student mobility programmes through virtual mechanisms.

Much of the professional and commercial world now exploit the opportunities offered by information and communications technologies to undertake their routine business. Project teams work effectively with members distributed around the globe and many business conduct their business on a 24 hour basis by rolling responsibility from office to office with the turn of the globe.

Virtual mobility will increasingly be regarded as a key component of higher education programmes providing students with the opportunity to experience international course offerings and become part of international student communities.

Key factors for consideration in the design of such programmes are more concerned with administrative and academic cultures rather than factors associated with technical feasibility.

Clear definition of course outcomes, credit transfer, (both import and export), and acceptability of courses as programme components will assist in establishing virtual mobility as an accepted component of e-learning programmes.

Conventional student mobility programmes offer cultural interchange as a key justifying factor, the cultural interchange of the web differs in nature but is indisputably an environmental for cultural interchange with a global dimension.

There is an element of novelty in virtual mobility which may challenge the norms and expectations of conservative professional bodies, nevertheless it is the responsibility of institutions engaged in e-learning to proselytise the benefits of virtual mobility

Collaborative Ventures

There are several strong reasons that motivate institutional involvement in collaborative ventures in the development and delivery of e-learning. Resource sharing, effective service provision, academic coverage are typical reasons.

For institutions that have traditionally taught through face to face teaching the development of e-learning programmes requiring up-front content planning and development is a significant barrier to entry. This may be reduced significantly through collaborative development with one or more other institutions.

The challenge faced by the senior management of institutions contemplating this style of collaborative venture is that of achieving productive working relationships between the institutions at departmental level. Partnerships between academic departments is traditionally driven by shared personal interests and ambitions and hence it may be difficult to implement a comprehensive shared development activity between two institutions.

The challenge may be eased somewhat in consortium arrangements where the scope for "departmental matchmaking" is greater.

However departments are brought together each element of the collaboration should be appropriately contracted, hence it should be anticipated that there will be an overarching contract providing the framework of agreement between institutions/consortium members, the anticipated standards that the partnership/consortium will endeavour to attain and the broad financial arrangements. Project specific contracts will provide the details of each development project, define deliverables, allocate responsibilities, define management processes and financial parameters. The attribution of the rights of the institution and individual contributors will be addressed in contractual arrangements.

The development of academic programmes is an extended process and in the majority of instances students are registered on programmes before development of all courses in the programme is completed. An institution offering a programme in which component courses are to be developed through collaborative ventures is exposed to significant risk. However secure contractual arrangements may be, resolution of any problems arising from projects under development at another institution will absorb management time and may lead to launch delay or non completion. Institutions should be able to demonstrate that they have contingency plans in place to cover for non compliance with contract expectations.

The management issues surrounding collaborative ventures for the provision of infrastructure and technical services may not present the same problems. There is often a clear interface within institutions between the academic and administrative divisions. Placing an additional interface may not significantly increase the complexity. It might be argued that the clear specification of service requirements in contractual relationships with a service provider could provide a clearer definition of responsibilities at the interface than might be the case in intra-institutional arrangements.

The institution's relationship with its students must be paramount in all collaborative provision of courses and services, and this should be reflected in all partnership contracts particularly those relating to collaborative ventures in the provision of services.

It should be anticipated that an institution playing a role in a consortium will take part in the management of that consortium and that terms of membership will have been discussed in appropriate management groups prior to formalising membership.

Membership of a consortium may impose standards and service protocols on the institution. The existence of these standards, their rationale and the impact on their use within the institution should be widely communicated within the institution to ensure that they are fully understood and are not in conflict with locally applied informal standards and codes of practice.

2 Curriculum Design

An important aspect of the quality of e-learning concerns the design of the curriculum. E-learning curricula offer considerable opportunities but are accompanied by risk. It is assumed that curriculum design is broadly constrained by european and national expectations on the knowledge, skills and professional outcomes -based curriculum elements.

This section addresses the particular challenges of curriculum design presented by by e-learning.

Key Factors concern: Flexibility in time and pace of study, programme modularity, building the academic community, and integration of knowledge and skills development.

The challenge that institutions face is that of designing curricula that combine the flexibility in time and place of study offered by e-learning without compromising standards of knowledge and skills development or the sense of academic community associated with campus based provision that will continue to be regarded as the benchmark against which other provision is measured.

Curriculum design should address the needs of the target audience for e-learning programmes that, in the context of growing emphasis on lifelong learning, may differ significantly in prior experience, interest and motivation from the traditional young adult entrant to conventional universities.

Benchmarks

1 Curricula should meet the specified expectations of the awarding institution with respect to the quality of the provision through e-learning

2 Curricula should be designed in such a way as to allow maximum flexibility for the learner with respect to time, place and pace of learning, consistent with the satisfactory achievement of learning outcomes and integration with other (non-e) learning activities

3 Curriculum design should ensure that appropriate provision is made for the acquisition of general educational objectives and the integration of knowledge and skills across the programme of study. When blended learning is used, the contribution of e-learning components to the development of education objectives needs to be made clear.

4 Curricula should be designed in such as way as to require broad participation in an on-line academic community. As well as student-student and student-tutor interactions this should include, where appropriate, interaction with external professionals and/or involvement in research and professional activities.

5 E-learning curricula should conform to qualification frameworks, codes of practice, subject benchmarks and other institutional, local or national infrastructural requirements in the same way as non-e curricula.

2.1 Flexibility

E-learning offers the opportunity to provide flexibility in the time, place and pace of learning. The presentation of content can be more flexible and the didactic approach can be more open. A key consideration is usually the integration of e-learning with other study modes and providers need to demonstrate that they allow students to extract the maximum benefit from the flexibility offered.

Institutions need to have clear policies and practices for scheduling and undertaking programmes and courses that take due account of student requirements for flexibility in time and place of study. The impact of these policies and procedures on course and programme completion, skills and the development of student communities should be assessed.

Institutions should identify and analyse patterns of usage and use these to inform policies on flexibility.

2.1.1 Time and Pace

24 x 7 access to computer network systems is one important aspect of flexibility which is considered in the student support section. Flexibility also needs to be considered at the macro and micro levels of programme design.

At the macro level students may have the flexibility to start and complete courses and programmes to schedules of their own choosing.

At the micro level e-learning offers the possibility for students to work to flexible timetables of their own choosing within a cohort of students progressing through the course or programme to overall schedules established by the institution.

At the level of curriculum design the focus is usually on the macro level with the presumption that the detail of course materials design and delivery system availability will be implemented to maximise micro level flexibility.

While conventional annual or semester-based cycles of course provision may not be appropriate for students on e-learning programmes, the scheduling of courses with no fixed start or finish times is not necessarily educationally desirable. Fixed start and finish dates for course modules constrain student flexibility but facilitate the management of student cohorts and allow for participation in group activity.

Fixed times for submission of assignments provide target dates for task completion and provide a structure analogous to the lecture or seminar schedule of a face-to-face programme but may place significant restrictions on the flexibility required by students facing pressures from family or employment obligations.

Indicators

At threshold level:

There is an institutional policy for course scheduling which curriculum designers adhere to.

At excellence level:

This policy provides curriculum designers with a range of options for the scheduling of course presentations.

The selection of particular options is influenced by market research amongst potential students.

There is consistency in the scheduling patterns adopted such that student movement across related courses or programmes is facilitated.

2.1.2 Place

E-learning programmes should offer learners considerable flexibility in the place of study with the optimum being the full provision of learning facilities via any internet access point.

If the institution operates a network of study centres that provide elements of e-learning on an intranet basis (*eg* for reasons of licensing or specialist video conference services) the requirement for attendance at such centres should be clearly recognised as placing a restriction on student flexibility.

Provision of aspects of the curriculum that require access to specialist facilities such as laboratories, and direct face to face human contact may detract from institutions offering programmes fully on line. In these circumstances blended provision is the only practicable mechanism.

A major issue for curriculum designers is the distribution of activities that are resticted in place. Designers may chose to aggregate face-to-face activities in a small number of modules within a programme with the result that these modules require similar levels of attendance to conventional provision. Alternatively curriculum designers may distribute the activities so that the majority of modules have a limited requirement for attendance.

It is envisaged that institutions will address issues of eligibility for study by virtue of place of residence at national, European Education Area and broader international presentation and will have policies relating to rights issues, examination arrangements *etc.*

Indicators

At threshold level:

Institutional policies provide a consistent approach to defining the circumstances under which students should be required to attend a particular location. These will be (i) for pedagogical reasons or (ii) for reasons associated with identity verification.

Programme information clearly indicates the pattern of any attendance requirements and the eligibility for study by place of residence.

2.1.3 Blended Learning

Most e-learning is likely to take place in conjunction with other forms of learning, either face-to-face or using more "traditional" distance methods. Curriculum designers need to consider what is the optimum mixture of online and traditional approaches in particular contexts.

The mixture should depend on several factors, such as actual distance (time and place) between student and teacher, the nature of the learning outcomes, skills acquisition, modes of assessment, *etc.*

The institution may offer students the opportunity to blend their learning by offering equivalent course modules through different modes of delivery. For example a student may choose to study the preliminary parts of a programme through e-learning but choose to attend campus based courses for the remainder.

Consistency in module size, clearly stated learning and skills development outcomes will assist students in the selection of programmes and study modes that best suit their requirements.

Indicators

At threshold level:

Where blended learning is employed, the curriculum provides a balanced mixture of online and traditional approaches to learning, including assessment

Curriculum designers have assigned clear pedagogic functions to the components of the programmes and the these match well with the delivery mode envisaged

At excellence level:

There are opportunities to complete programmes by integrating e-learning and face to face courses within a single programme

2.2 Modularity

Appropriately designed and implemented modular programmes enable institutions to offer their students a broad curriculum and optimise utilisation of resources.

The costs of e-learning development dictate that many institutions will seek to work in institutional consortia for curriculum development. Under these circumstances agreement over modular structures at programme and course levels is imperative.

The institution should adopt a structure for programme and course sizes that is consistent with national and european norms and aligns with systems for credit accumulation and transfer.. These should be based on student workloads (expressed in notional study time) and the conversion rate into credit points should be widely understood.

Students should be presented wherever possible with short and flexible elements or courses from which to build a programme which meets their needs.

2.2.1 Navigation

Modular programmes may be difficult for students to understand at the outset of their programme, hence the institution should make every effort to ensure that students are in a position to construct a programme that addresses their needs.

Curriculum designers should provide guides to their programmes that indicate routes appropriate to students with commonly encountered profiles of prior education and experience.

E-learning students are likely to use on-line access to investigate programme availability, a curriculum map and advisory notes should be prepared by the curriculum design team and available to potential students from programme launch

Indicators

At threshold level:

Navigation through possible course combinations is facilitated by on- line curriculum maps and advisory notes are available informing students of the consequences of particular choices.

2,2,2 Credit Transfer

Credit transfer between programmes within an insitution and more broadly between institutions and across national boundaries contributes to the flexibility offered to e-learning students.

Policies on credit transfer and the technical features of credit systems should be applied to e-learning programmes in the same way as for other modes of provision. These need to be aligned to national and european systems for credit recognition and transfer. Curriculum designers need to be clear about definitions of credit and credit value, workload measures, credit levels, qualification requirements, learning outcomes, assessment criteria, *etc.* Each of these factors will impact the policy for credit transfer into and out of the programme.

Credit transfer is a two way process, policies should address both import and export of credit.

Curriculum designers should address both skills and knowledge domains in their assessments of the credit they may chose to award to imported and exported credit

Indicators

At threshold level:

The insitution has a credit transfer policy that is widely applied.

The credit transfer system is aligned with national and european systems of credit transfer and operates bi-directionally.

2.3 Academic Community Development

Participation in a scholarly community that values the exchange of knowledge and ideas is an essential component of higher education. Institutions presenting e-learning programmes should design their curricula to foster broad participation in an on-line academic community.

In some instances participation is explicit through student (and staff) contributions to group activities designed as components of the curriculum, in other instances it is implicit through scholarly social interaction in a campus based environment.

To provide parity of experience between traditional forms of higher education and provision primarily delivered through e-learning, institutions should specifically address the issue of formal and informal community building across its academic community.

Policies for curriculum design should specifically address the knowledge and skills acquisition required by national and european award structures, identify those elements in which collaborative activity is required and provide broad direction as to how students following e-learning programmes should participate in the broader academic community

Three aspects of community development may be identified to which curriculum design needs to be sensitive.

Firstly, a general academic community is required by all departments and divisions of the insitution to provide a framework for student-teacher and student-student interaction.

Secondly, communities may need to be established to fulfil a specific academic objective, such as participation in research activity.

Thirdly, communities may need to be established to link students in with broader professional communities.

2.3.1 Student-student, student-teacher

E-learning offers modern ways of building communities between teachers and students, and between students and their peers. Time, place and pace are flexible, content can be presented remotely, however personal interaction between student and teacher (tutor) is a key component of e-learning in a higher education context. As there is no direct contact in the delivery of taught content, it should be a principle of curriculum design that alternative embedded prompts are used to initiate contact.

Structuring remote student-student contact for academic related discussion presents greater challenges but the institution should be supportive of the formation of on-line discussion groups.

If student-student interaction is required for a specific pedagogic function (*eg* to provide for the development of effective team working skills) curriculum designers should establish the requirement in programme specifications and ensure that the responsibility for teaching and assessing these skills are allocated between courses in the programme.

Students should be informed of those peer-peer interactions that are essential to successful completion of a programme and measures should be in place to ensure that such interactions are appropriately monitored and assessed.

The institution may work with student groups and associations in fostering on-line student groups that operate independently of programme structures. These groups may have a subject, professional or predominantly social focus.

Indicators

At threshold level:

There are institutional policies relating to the development of on- line communities allowing student-student and student-teacher interactions.

Criteria for the assessment of student-student interaction exist and are applied consistently across programmes and courses.

At excellence level:

Curriculum designers specify clearly the pedagogic role that student-student interaction plays in their programmes.

2.3.2 Connectivity with non-campus professionals and professions

Programmes that are professional or vocational in nature may traditionally require students to spend some part of their study on placement activities in a professional organisation of some sort. Designers of e-learning programmes should explore how they might manage these situations particularly taking account of the fact that e-learning courses may have greatest appeal to students who are already in employment.

Institutions may adhere to conventional policies that require students to be embedded in an organisation selected by the institution or alternatively develop modes of work-based assessment that relate to their students' current employment and allow for negotiation with their employers.

There are significant potential difficulties for workplace-based professional practice for institutions intending to operate across national boundaries or a broad geographic territory in the negotiation of placement arrangements.

Less formal community building with the professional sector may be achieved through strucured links to professional body websites, jointly developed on-line events, *etc*

Indicators

At threshold level:

The institution offers mechanisms for students to participate in active communities of research and professional practice where this is an integral part of the programme.

At excellence level:

The curriculum offers opportunities for (distance) contacts between fellow students and with teachers, researchers, professionals *etc* to stimulate and develop a critical attitude.

2.3.3 Research Involvement

Development of research skills and participation in individual or group research activity is a requirement of national and european qualification structures at degree level. Institutions offering programmes delivered through e-learning must be able to demonstrate that these skills can be delivered and assessed using on-line technologies.

Access to library facilities now seldom presents problems for students studying remotely and web-based research forms the backbone of many conventional research projects.

On-line students may contribute to the work of campus-based research groups possibly participating in meetings using desktop video and audio conferencing methods.

Access to laboratory facilities poses greater problems but it should be recognised that many students choosing to study remotely by e-learning may be studying for professional reasons and be in a position to undertake research activity related to their full-time employment.

Curriculum frameworks should facilitate a broad interpretation of how research skills may be developed and not restrict the definition to focus solely on "traditional" campus-based research activity.

Curriculum design should address the placement of research modules in programmes taking due account of the skills and independence that will be demanded of students in conducting research remote from day to day contact with supervisors.

Research supervisors may require new skills to transfer their supervisory experience to an on-line context, programmes should be available to support this transition.

Institutional policies regarding the publication and attribution of the outcomes of research should be reviewed to ensure that they adequately address issues associated with the contribution of e- learning students.

On-line publication is an obvious publication route for students undertaking e-learning. Publication within a closed on-line community associated with a programme or subject area will facilitate the development of a community of researchers and encourage a culture of supportive critique and review.

Indicators

At threshold level:

The curriculum offers students the opportunity to undertake or be involved in research in order for them to develop appropriate research skills and skills of critical evaluation and communication.

A progressive development of research skills is an integral component of programme design.

At excellence level:

The institution has policies regarding the involvement of e- learning students in the activities of campus-based research groups.

Opportunities are provided for on- line publication and peer review in a supportive environment

2.4 Knowledge and Skills

Curriculum design should ensure that the curriculum covers those aspects of knowledge and skills required of graduates in the domain under consideration.

The issues specific to e-learning are those of whether skills can be developed uniformly across all courses in a programme or whether there is a need to adjust programme structure in order that the mode of delivery demands some partitioning of skills and knowledge acquisition.

There remain issues of whether delivery of some aspects of skills acquisition can be achieved using e-learning technologies. In this domain institutions have a responsibility to demonstrate to their students and to regulatory bodies and employers that the delivery of skills and their assessment are valid and effective.

2.4.1 Transferable skills

The development of a suite of core transferable skills that relate to literacy, numeracy, critical analysis, presentation and communication and which when combined provide a measure of "graduateness" is an essential aspect of higher education programmes. These are skills highly valued by employers who may regard them as of equal if not greater importance than the subject knowledge that graduates take with them to the world of employment.

Institutions offering e-learning programmes have a responsibility to provide these skills for their students and to demonstrate their provision and effective assessment to potential employers.

A key element in curriculum and programme design is the clear definition of learning outcomes and skills to be acquired at various stages. Curriculum designers should identify a logical progression of skills development and allocate responsibility for delivery and assessment of skills to courses in a programme.

Skills prerequisites may be as important as knowledge prerequisites in determining progression between courses in a programme

The institution may need to develop specific assessment methods to verify skills acquisition.

The institution may support students in recording evidence of skills acquisition via an e-portfolio system.

Indicators

At threshold level:

The institution has a clear policy regarding the acquisition and assessment of core transferable skills which apply to all programmes including those delivered by e-learning.

The institution has a common framework for the assessment of skills acquisition.

At excellence level:

The institution actively researches the development of generic skills and findings are widely disseminated to those involved in curriculum design via publications, workshops *etc.*

The institution offers an e-porfolio service to assist students in recording their generic and transferable skills.

2.4.2 Professional and vocational

The curriculum should offer students the opportunity to build relationships between different areas of content and between contents and skills used by professionals (including researchers) in their occupation. The development of professional and vocational skills should align with the expectations of professional bodies and employers.

Many students pursuing e-learning programmes may already be in employment, and institutions should make positive efforts to provide recognition for the professional skills and knowledge already held by their students.

Professional bodies may adopt a conservative approach to the potential of e-learning for provision of professional skills, and institutions may need to pay particular attention to ensure that their curricula develop and assess these skills, and that this is apparent to all.

Curriculum design may allocate responsibility for development of professional skills to specific modules that address their development in a blended learning format or even require attendance for the full duration of the module.

Indicators

At threshold level:

Curriculum design ensures that students are able to build relationships between areas of content and with professional skills.

The responsibility for delivery and assessment of outcomes related to professional knowledge and skills is clearly assigned to particular components of the programme.

At excellence level:

Communications with professional and employer associations regarding their needs and the effectiveness of e-learning in developing and assessing professional skills have been undertaken at the curriculum design stage.

2.5 Assessment procedures

It should be the goal of all institutions engaged in e-learning to develop and implement assessment systems that are recognised as at least being equivalent to those used in conventional systems regarding their effectiveness and integrity.

Assessment needs to involve both formative and summative elements. Individual items of assessment may have either or both.

Curriculum designers should address the intended learning outcomes for a programme and ensure that there is an overall strategy for the assessment of learning outcomes that reflects the diversity of the modes of knowledge and skills acquisition.

2.5.1 Formative assessment

Formative assessment can take a variety of forms ranging from voluntary self-assessment tests with built-in feedback to more formal items of assessment, which may well have a summative assessment role, but which also demand individualised feedback from a tutor or examiner and through which a student can judge their progress and reflect on their further learning.

The role of formative assessment in e-learning curricula is a crucial one in overcoming the limitations imposed by self-study, and curriculum designers need to exploit the opportunities offered by e- learning platforms to provide feedback to students and to allow assessment of progress at regular intervals.

2.5.2 Summative assessment

Procedures for summative assessment need to be:

- explicit (*ie* the requirements for successful completion of the assessment item and the criteria by which marks are allocated should be clear to students and examiners alike)
- fair (*ie* the nature of the assessment should not favour or disfavour any particular student or group of students)
- valid (ie the assessment should be an effective test of the achievement of the particular learning or skills outcome(s) under consideration)
- reliable (*ie* the procedures for assessing performance and allocating marks are consistent with respect to time, place, and the participants involved)
- plural (*ie* not over-reliant on one particular form of assessment)

Assessment judgements need to be exercised collectively, as far as possible. Where e-learning programmes involve the participation of examiners at widely dispersed geographical locations, measures need to be put in place to ensure that agreed marking criteria are being adopted consistently. This may involve workshops (physical or virtual) for training and dissemination of good practice, and will involve some form of second-marking between examiners. External moderation of summative assessments and their outcomes is regarded as good practice, and e-learning curricula generally lend themselves well to external moderation.

Particular care needs to be exercised in on-line summative assessments to ensure that the work submitted for assessment is that of the registered candidate for the award. Cheating can take the form of impersonation for a written examination or plagiarism of another's work in essays or assignments. Computer software is now routinely used to check for possible plagiarism. Preventing impersonation on-line is more difficult, and for this reason many e- learning programmes require candidates to attend a registered examination centre to undertake written examinations.

It is good practice to identify and analyse cases of significant discrepancy between individual students performance on different forms of assessment.

Indicators

At threshold level:

The institution's processes for curriculum design take proper account of the particular requirements for effective formative and summative assessment on-line.

Assessors notes for curriculum design

Institutions designing programmes to be delivered using e-learning face the challenge of ensuring that their programmes address the established national or international standards and norms appropriate to subject and level and, at the same time, exploit the unique features of delivery by e-learning.

Those designing curricula to be delivered by conventional face to face presentation are able to exploit the flexibility inherent in face to face interaction between teacher and student whereas e-learning, in many instances, demands a tight specification of learning outcomes and the design teaching interactions through which they are delivered. The challenges of curriculum design for e-learning are reduced if national curriculum standards are based on learning outcome frameworks that clearly define requirements for knowledge acquisition and skills development. Working within such a framework curriculum designers can allocate specific learning outcomes to programme sectors and deploy appropriate support mechanisms and technologies.

Institutions developing e-learning programmes may use knowledge management processes to elicit and share experience between departments in learning outcomes delivery directed at developing an institution wide appreciation of the techniques available, their pedagogic effectiveness and student response to them. An institutional perspective on what is achievable through any particular mode of delivery should inform and help shape curriculum design.

The major challenges lie in the delivery of learning outcomes the require direct interaction between individuals or the acquisition of practical skills. Institutions may implement policies that require some professional and communications skills to be delivered by modes other than e-learning. Curriculum designers should ensure that the impact on students electing to use e-learning as their primary mode of study.

Assessors should endeavour to determine that curriculum designers adopt a realistic stance to the integration of courses or modules requiring physical attendance within programmes delivered primarily through e-learning

Flexibility

E-learning offers considerable flexibility in the time, place and, possibly, pace of study, however in most instances it is unrealistic to offer students programmes that offer both 24x7 availability and full student choice of start and finish dates. Programmes delivered by face to face mechanisms are essentially paced by the schedule of lecturers or other face to face teaching activities (laboratory sessions, workshops etc) and these in turn determine the schedules for assessment and examination. In the absence of face to face events many students will use the assessment and examination schedules to determine their pattern of study.
It is anticipated that the majority of curriculum designers will opt for provision that sets schedules for course completion at a macro level, (fixed schedules for assessment and examination etc) but allows significant flexibility for students to adjust their study pattern at a micro level to suit their particular personal circumstances.
The frequency of fixed assessment points may impact on the real flexibility available to students at the micro level. There are inevitably significant interactions between size of module and the flexibility offered to students: a small module offered over a

comparatively short study period may provide student's less opportunity to exercise flexibility in management of their study pattern than a larger volume of study offered over a longer period. In the latter case students may be able to compensate for periods of work or familly pressure by committing more time to their study during other periods whereas in the former allows fewer options for workload management.

Students electing to study modules in parallel may encounter particular difficulties in workload management if modules have similar assessment patterns and schedules, hence curriculum and programme designers might wherever possible seek to decouple the assessment schedules on those modules most likely to be studied in parallel.
Institutions may use both student survey and analysis of patterns of on-line system usage to determine the use made by students of the flexibility offered to them and to relate student study patterns to assessment and other course landmarks. The outcomes of survey activity should be widely disseminated to share best practice across departmental boundaries.

Limitations on place of study are increasingly difficult to justify as it is envisaged that the majority of e-learning is delivered via the web and thus available at any web access point. The need for identity checks for key assessment items and examinations may dictate that students attend a particular supervised location but curriculum designers should exert pressure to ensure that such assessments can be taken in as wide a range of locations as possible rather than simply centres managed by the institution itself.

Assessors should determine the steps taken to ensure that the institution and curriculum designers endeavour to explore all opportunities to reduce any limitations on location of study.

Academic community development

Curriculum designers should adopt a realistic approach to the level of student involvment that can be anticipated in informal on-line communities. On-line communities may be represented as an alternative to the face to face interactions enjoyed by campus based students but in reality on-line communities are frequently dependent on the inputs of a few proactive enthusiastic contributors to provide impetus to discussion. However, in contrast the informal interactions of a campus base institution, the contributions of the enthusiasts are available to all within the community rather than simply their close associates. Assessors may be provided with access to typical discussion threads from informal discussions (subject to confidentiality terms established for student discussion boards). Statistics on readership of messages as well as records of postings etc will provide a more complete picture of the dynamics of on-line community activity.

The role of academic staff in on-line activity is clearly separated into direct interactions with individual students and the role as a motivator of on-line discussion in tutor mediated conferences. It is important that curriculum designers define the role that they expect their tutors to fulfil and that there is evidence that they are supported in acquiring the skills necessary to execute that role.

Curriculum designers may opt to exploit on-line conferencing and group working tools to deliver learning outcomes related to group working. Those doing so should demonstrate that they have addressed both the pedagogic and technical issues associated with this mode of student collaboration.

Management of group work presents challenges in a campus setting but the complexities are significantly greater in an on-line setting. On-line project teams are widely encountered within large organisations but participants operate in an environment constrained by organisational culture, performance management systems and the financial incentives of their employmentp; identities, authorities and roles are interpreted and understood by participants against a corporate culture. Curriculum designers planning to use online collaborative projects should demonstrate

3 Course Design

Benchmarks

1 Each course should include a clear statement of learning outcomes and (in a blended-learning context) the rationale for using e-learning as the pedagogical approach.

2 Outcomes should be of such a nature as to be attainable through e- learning, augmented as and when necessary by face-to- face provision. Learning outcomes, not the availability of technology, should determine the means used to deliver course content and there needs to be reasoned coherence between learning outcomes, the strategy for use of e-learning, the scope of the learning materials and the modes and criteria of assessment.

3 Course outcomes and objectives should be compatible with those of courses delivered by other means.

4 Courses should be designed in such a way as to :

- foster active learning
- facilitate individual study and the development of study skills
- support the development and interaction of learning communities
- place the learner in control of time, place and pace of learning wherever possible
- recognise the diversity of learners and build on their strengths and backgrounds
- make appropriate allowances for persons with disabilities
- be sensitive in their use of materials to the cultural diversity present amongst learners
- require learners to reflect on, evaluate and provide feedback on course contents and requirements

5 Interactions between students and with tutors (both synchronous and asynchronous) should be facilitated by a variety of means including e- mail, telephone, group forums etc to allow both individual and group interactions. Access to tutors should be designed to be on a regular and sufficient basis known to both tutors and learners.

At the minimum level of engagement tutors should provide learners with timely expert advice on course issues or materials and individual feedback on assignments.

Where self-study materials are meant to be free-standing, they should be designed in such a way as to allow learners on- going feedback on their progress through self-assessment tests.

6 Course design, development and evaluation should be managed by teams comprised of subject faculty, content experts, instructional designers, technical experts, and evaluation personnel. Integral to the course design process should be mechanisms for trial materials and incorporating feedback into the final product. Ideally, techno-pedagogic decisions should be made naturally within a supportive culture and a strategic policy framework at

	institutional level.
7	A sufficient level of interactivity should exist in each course to require learners to engage actively with the learning materials and to enable them to test their knowledge, understanding and skills at regular intervals.
8	Course materials should conform to specific guidelines concerning layout and presentation and be as consistent as possible across a programme.
9	Course materials, including the intended learning outcomes should be regularly reviewed, up-dated and improved using feedback from stakeholders as appropriate.
10	Courses should provide both formative and summative assessment components. Summative assessment needs to be explicit, fair, valid and reliable (see section 2.5.2). Appropriate measures need to be in place to prevent impersonation and/or plagiarism, especially where assessments are conducted on-line.

3.1Pedagogic Design

Decisions about the use of e-learning in particular contexts should be made on the basis of the most effective means of achieving the learning outcomes set, not on the basis of availability of the technology.

E-learning provides tools to support a range of pedagogic modes: highly efficient text and interactive media distribution to serve didactic approaches, resource rich environments for problem based learning and collaborative working environments for dialogue centred learning processes.

It is expected that Pedagogic Design choices will vary with the subject and level of courses, an e-learning institution should provide for diversity of pedagogic approaches in its offering.

There should be a clear rationale for the use of e-learning and the level of support provided.

Pedagogic designers must resolve the tension between the ease of access offered by the anywhere, anytime availability of on-line e-learning delivery and the flexibility of pedagogic interaction offered by direct face-to-face contact with teachers inherent in the best of classroom based teaching.

3.1.1 Pedagogic Strategy

Establishing a pedagogic strategy is a key stage in course design. Those undertaking this task should address how the e- learning methodologies available to them can best be used to assemble a pedagogic model appropriate to the level and subject domain of the course.

Three broad pedagogic approaches make differing demands on the capabilities of e-learning systems:

Didactic learning: Efficient delivery of structured teaching materials, embedded testing and remediation can be achieved on-line allowing for flexible pace of study by independent learners working to self determined schedules

Problem based learning: On-line learning can provide access to information resources that are on a par with campus based access but learner support and assessment require human intervention

Collaborative Learning: Tools for on-line collaborative working are widely available. Their use however places constraints on flexibility in place and time of study and appropriate academic oversight.

The majority of courses will utilise several pedagogic approaches to secure their learning outcomes. The use of different types of e- learning and levels of support needs to be fit for purpose.

Indicators

At threshhold level:

Staff understand the advantages and disadvantages of using e- learning for knowledge and skills acquisition in particular course contexts.

At excellence level:

Understanding of the relationship between pedagogical design and e- learning component methodologies is widespread and evidence- based.

3.1.2 Pedagogical blended model

The pedagogic approach currently referred to as blended learning advocates the use of a number of media for curriculum delivery and student support. For example, students may study e-learning materials but attend occasional face to face seminars to facilitate academic community building and practice of interpersonal skills.

Rationale for the blend should be clearly communicated to students in course documentation.

Indicators

At threshold level:

Fitness for purpose should drive decisions on the selection of pedagogic components. The blending should be such that different methods and media are well chosen within and between courses, both in distribution over time and extent of use.

At excellence level:

There is extensive institutional experience of delivery using blended learning and this experience is widely shared through the organisation.

Well informed decisions on the use of pedagogic components are made routinely and reflect institutional policies regarding the development of learner knowledge and skills.

3.1.3 Mentored e-learning model

In online delivery instructors/tutors/mentors undertake a vital teaching role that differs from that of a conventional traditional classroom teacher. It is frequently asserted that the use of tutors is key to achieving high student satisfaction rates and low dropout rates. At pedagogic design phase course designers must define the roles that will be undertaken by those responsible for provision of on-line support.

In a mature e-learning institution these roles will be well defined and course designers will have a number of options, suited to differing levels and subject domains, available to them.

Indicators

At threshold level:

Access to tutors is designed to be on a regular and sufficient basis known to both tutors and learners.

At the minimum level of engagement tutors provide learners with timely expert advice on course issues or materials and individual feedback on assignments

Tutors are able to use a variety of means (e-mail, telephone, forums etc.) to interact with learners both individually and in groups.

The course design requires tutors to monitor learners' progress on a regular and on-going basis and to contact learners whenever required to discuss progress.

At excellence level:

Tutor-learner and learner- learner interaction is integral to the pedagogic design

Where a VLE is deployed this fully supports the range of interactions needed, including individual and group interactions, disclosed and undisclosed.

3.1.4 Self-Study Materials

The use of learning materials designed for independent student study offers learners significant flexibility in time and place of study.

Self study materials may provide part of the main course material but more usually offer a valuable mechanism to provide additional support in topics that may be desirable, rather than essential prerequisite knowledge for a course.

When delivered by e-learning the materials should be designed to maximise the use of interactive techniques to provide opportunity for student assessment of progress towards learning outcomes.

The course design team must be confident that use of self study materials will command the respect of their academic and professional peers in order that students will gain due recognition of their acheivements

Indicators

At threshold level:

The function and purpose of self study materials is clearly defined and communicated to students

Self paced materials incorporate extensive embedded testing of learning objectives

Materials have specified embedded learner support and self assessment elements.

At excellence level:

Materials demonstrate high levels of student activity providing a rich learning experience.

Self assessment elements provide remedial teaching in response to student performance.

3.2 Course design

The course design process should demonstrate a rational progression from establishing the need for the course within the overall curriculum, through the design of a conceptual framework to the detailed development and production of course materials.

Each course should include a clear statement of the learning outcomes to be achieved on successful completion. These outcomes will be specified in terms of knowledge, skills, vocational/professional competencies, personal development, *etc.* and will usually be a combination of these.

The development of each course should provide a clear documented course specification which sets out the relationship between learning outcomes and their assessment.

Though aspects of detailed development and implementation of the e- learning course might be subcontracted to an outside agency the delegation of such tasks should be conducted under full oversight of the parent institution.

Where the design of the e-learning course has been contracted out to the responsibility for its performance remains with the awarding institution. Under these circumstances, arrangements for its evaluation, modification and enhancement are important aspects of the programme plan.

3.2.1 Relationship with Curriculum

The course should be designed to fulfil a clear role in the institution's curriculum and the learner's overall programme with clear statements of its objectives in terms of knowledge acquisition and skills development.

Indicators

At threshold level:

Course planning and approval takes place within a structured curriculum framework.

The objectives and learning outcomes for the course and its methods of assessment should be comparable with those of courses delivered by other means.

Rationale for use of e- learning and the level of support provided should be clear to staff and learners alike.

At excellence level:

Course Learning outcomes and skills acquisition are mapped to an institutional framework.

The role of the e-learning course in the programme as a whole is set out clearly and comprehensively in student handbooks/guides

3.2.2 Conceptual phase

During this phase, course designers will define:

- the coverage of the course
- the key pedagogic techniques that will be used
- the likely methods required for assessment

and, regarding the human and other resources needed:

- the subject expertise required
- the professional skills required

The output from this phase of activity is an outline specification of the course and it may represent a critical step in an institution's course approval and resource allocation process

Mechanisms for acquiring feedback from learners and other stakeholders also need to be planned at this stage

Indicators

At threshold level:

Students' expected prior knowledge and competencies have been considered and requirements made explicit.

Sources of expertise have been identified

At excellence level:

Course design, development and evaluation is managed by teams bringing expertise in subject domain, media use, instructional design, technical expertise, and evaluation.

Integral to the course design process are mechanisms for trialling materials and incorporating feedback into the final product.

The importance of appropriate interaction (synchronous or asynchronous) between learners and with tutors is reflected in the design of the course.

3.2.3 Analysis

This phase of course design further develops the course specification, typically through undertaking a detailed contextual analysis of learner and institutional contexts addressing key issues of e-learning such as access to ICT and networks.

The outcome of this phase is a detailed specification of the course, its learning outcomes, skills development, detailed content, modes of delivery, assessment rationale, and the support that forms the framework for the remainder of the development process.

Statements of knowledge and skills prerequisites are an important component of the specification particularly in institutions and consortia constructing modular programmes.

Dependent on the scope and size of the course, authoring roles will be allocated to specific authors. The authoring specification will indicate the outcomes expected.

Academic authors and media professionals are commissioned to develop course materials within the course specification framework

Assessment instruments may be used to ascertain the specific learning styles of students, which then determine the type of course delivery

Indicators

At threshold level:

Key aspects of the course and learner context are researched and specified.

Detailed prerequisites and student learning outcomes, both knowledge and skills-based are specified.

There are clear statements regarding the use of ICT within the course

At excellence level:

Analysis of course and learner context is conducted within an institution-wide framework.

Pre-requisites and student learning outcomes are developed within an institutional, or national framework, facilitating student mobility between courses, departments and institutions.

Each course defines its use of ICT within an institutional framework.

3.2.4 Content Criteria

Student interaction with course material is a key factor in e- learning. Design of course content should aim to deliver outcomes via a balanced use of e- learning media, on-line support facilities and (in the case of courses employing a blended learning approach) other teaching media.

In particular, content should:

- be interactive
- be relevant, appropriate and clearly presented
- build on and reinforce prerequisite concepts and skills
- introduce, assess and reinforce new concepts and skills
- be logically structured and sequenced

Course designers will match their use of the media and delivery modes available to them to the course outcomes identified in the analytical phase.

Course designers will develop content that allows for pedagogic and subject updating.

Indicators

At threshold level:

The specification of course content demonstrates appropriate matching of e- learning media with pedagogic objectives.

The e-learning content is well structured with clear relationships between components and signposting of study routes through the course materials

At excellence level:

The institution has effective mechanisms to share knowledge and experience in the design of course content and the consequent impact on student learning.

E-learning content is designed to allow for updating and adaptation to new contexts.

3.3 Materials and production design

The processes employed in the design and production of course materials may have a major impact on their teaching effectiveness.

Development of a course can be a significant media and software development project and demands the application of project management techniques that may be applied either from initial course design or, if there is a formal separation between the two, through the materials production phase.

It is presupposed that inputs from several professions are desirable for the development of high quality e-learning materials.

Effective interaction between key professionals is an important performance indicator.

3.3.1 Technical design

The Institution should provide a framework of technical, accessibility and presentational standards that apply to e-learning materials and systems embracing the following factors:

- Ergonomics: Interfaces used in the technical design of courses should conform with up to date standards of ergonomic design and navigation through e-material
- Attractiveness: Interfaces and design of material, including e-material, should conform to broadly acceptable standards and be neutral as to sex, ethnicity, age and related issues.
- Modernity: Software used in the courses should conform to recent standards of version and use, and be platform neutral or offer a choice in use
- Downloads: Material to be downloaded should take into account reasonable standards of time to download, pace of download, and platforms of compression (if used).
- Updating: Software used should be such that updates are easily accessible
- Consistency: Consistent style sheets and schemas should provide consistency of use for learners. Authors should be provided with consistent authoring tools and a supportive environment to enable them to make effective use of tools.

Indicators

At threshold level:

The course materials and other on-line services are designed to operate effectively on a clearly specified equipment and connectivity platform.

The technical aspects take appropriate account of the locations and circumstances in which students may access the learning materials

At excellence level:

The institution provides course authors and course teams with extensive support on the technical aspects of course design.

The institution has one or more groups of staff committed to the ongoing development and implementation of policies relating to use software and other tools for course design

The institution has implemented a clear strategy for the technical requirements for student access to e- learning

3.3.2 Interface

As the route to accessing course content, poorly designed features of the student user interface may create irritating barriers to learning achievement.

The interface through which students interact with e- learning programmes may be contentious for a number of reasons. For example, students may be accustomed to particular interface tools through previous courses or their professional experience; academic staff may hold differing views from those responsible for the management of institutional systems; and departments may have historically operated differing systems.

From a student perspective the interface should be fully supported by all involved in course design and delivery, and incorporate common features across all the institution's programmes.

Important features are:

- That the interface is consistent. Elements such as font, text, placement and presentation should be consistent
- Feedback cues should be available, *eg.* the link changes colour when clicked *etc*
- Movement between levels and between services and functions should be intuitive and consistent
- The interface should comply with usability requirements
- It should allow outputs in different formats

Indicators

At threshold level:

Students' engagement with the course materials is assisted by use of a consistent interface providing access to course components

The function of course components is identified by consistent use of styles, formats, buttons etc.

All interfaces comply with applicable useability standards

At excellence level:

The institution provides course authors and course teams with a range of standard interface tools that can be customised to course-specific needs.

The institution offers course teams a choice of styles, formats *etc* that allow selection appropriate to course needs whilst providing operational efficiency and institutional identity

3.3.3 Content Criteria

The development of high quality e-learning content is dependent on close collaboration and good communication between academic course designers and those responsible for its realisation as teaching media.

Engagement between academics and media professionals in the technical design contributes significantly to the effectiveness of course materials. One key issue that impinges on working relationships is whether technical design inputs should be integrated with the academic and pedagogic design process or whether they should be applied to the outputs from this process.

Management of the interface between academic and media/technical experts is a key issue in circumstances where technical realisation of the teaching materials is subcontracted to a separate organisation.

At all times it remains the responsibility of academic leaders to rule on matters of pedagogy and content. Academics should be literate in the use of e-media and fully aware of technical opportunities and constraints.

The materials content should:

- conform to usability standards and guidelines
- conform to metadata standards
- be relevant, accurate, appropriate and clear
- be designed for regular updating
- be reviewed periodically to ensure it continues to meet program standards
- be appropriately interactive
- accord to legal requirements *eg* copyright issues be identified and documented

Indicators

At threshold level:

The course materials are judged to be fit for purpose by students and external assessors

The course content provides a range of learning experiences for students and is adequately interactive.

At excellence level:

The course materials are acknowledged to be of high standard by students, academic peers and media professionals

The course content offers diversity in the learning experiences provided and enables students to fulfil learning outcomes in a stimulating environment

The course content can be used flexibly in contexts other than its initial application.

3.3.4 Process management

The processes for producing course material should be well managed and allow for effective collaboration between the professional groups involved. It is anticipated that institutions will adopt and implement project management processes appropriate to their circumstances and that materials development projects will be progressed within agreed budgetary frameworks.

In circumstances where a significant proportion of materials production activity is undertaken by external organisations or consortium partners, external partners should be appropriately integrated into the project management process.

Particulars of the project management framework might include:

- Documentation of production processes and roles of the actors in them
- Clear protocols for the transfer and handover of course materials between professional groups
- Involvement of and support for all categories of professional staff engaged in materials development and production.
- Clearly established pathways for materials development allowing for parallel and serial contributions by professional groups and other participants as necessary
- Clear mapping of dependencies in the production pathways
- Establishment and use of protocols for version control
- Contractual templates for development activities sub-contracted to external agencies in compliance with industry best practice.
- Clearly defined relationships between contributors to consortium arrangements.
- Costing methodologies reflectingt the direct and indirect costs of media selection on the lifetime costs of the course.

Indicators

At threshold level:

The production of the course is progressed using an identifiable project management methodology

The roles of individuals within the project team is well defined and all recognise their professional interdependence

Those responsible for project management make timely and appropriate decisions.

At excellence level:

The institution operates a production management system that provides all involved with course production access to tools and information essential to monitoring course materials production

Well established protocols and contracts facilitate project management of course components commissioned from third party individuals or organisations.

The institution has extensive information on the costs of course materials production.

3.4 Assessment and Evaluation

Design of the student assessment and evaluation components of an e-learning course is an integral part of the design process and needs to be considered in both the curriculum design and course design phases (see also section 2.5).

3.4.1 Student assessment

Course designers should plan the process of student assessment as an integral component of a course addressing issues relating to scope and method of delivery. They should ensure that the assessment fits the method of delivery and that the total assessment burden is proportionate to the size of the course and its credit rating.

E-learning offers many opportunities for multiple embedded formative assessment and learning reinforcement loops. Course designers should exploit the interactivity of e-learning delivery to embed opportunities for self assessment.

Students should be fully informed on the nature and function of assessments, their contribution to summative assessment and their relationship to intended learning outcomes.

In circumstances where marking responsibilities are devolved to tutors, or in consortium arrangements appropriate measures need to be in place to ensure that the criteria for allocation of marks for each individual piece of assessment are uniformally understood and consistently applied.

Feedback on assessments, whether provided electronically or through human intervention is an essential teaching tool. Tutors should be required to grade and return all assignments within a certain time period and provide qualitative feedback to enable improvement.

Indicators

At threshold level:

Student assessment is an integral component of course design providing both formative and summative elements.

The course provides timely opportunities for students to verify their progress towards achieving learning objectives through both informal and formal means.

Appropriate measures are in place to ensure fairness and consistency in marking, and timely feedback to students. This is monitored on a regular basis.

At excellence level:

Staff development programmes in student on-line assessment are provided.

There is a demonstrable institutional commitment to improving assessment of courses delivered by e-learning through monitoring against appropriate performance measures and utilising feedback from students and tutors.

3.4.2 The examination process

Most e-learning courses will require one or more written examinations as a component of the summative assessment. Student performance standards on e-learning courses must be demonstrably equivalent to those on similar non-e courses. In designing written examinations, however, staff should take into account the students' primary mode of learning. Examination processes should be part of the learning design process, optimised for the particular course concerned, and there should be briefing to introduce examiners (including external examiners) to the e-learning methods deployed in the course. E-learning programmes pose particular challenges for institutions whose examination processes are based on traditional written examinations.

The use of e-learning raises issues on verification of identity, and appropriate measures need to be in place to ensure an absence of impersonation or plagiarism. Cross-referencing and correlation analysis between performance on written examinations and continuous assessment may be undertaken. Examination processes should verify attainment of learning objectives by a person who is identifiable as the person registered for the course. Examinations may need to be held at approved centres where identities can be checked.

Indicators

At threshold level:

Examination procedures for e- learning courses comply with institutional examination procedures and do not disadvantage e- learning students

Adequate identity checks guarantee the integrity of the examination process

At excellence level:

The institution operates examination policies that have been specifically designed/adapted to cater for the needs of e-learning courses and their teaching methodologies

Development of fully on-line examination processes is a key objective for the institution.

3.4.3 Course evaluation and approval

Institutions developing e-learning programmes make significant investment in the research, development and production of courses hence it is essential that at this stage in the development of e-learning that they have in place appropriate structures for the approval and longterm evaluation of courses. The development of learning materials and their subsequent improvement demands a greater formal commitment to external review, course testing and evaluation than would be the case in face to face presentation.

Independent evaluation of course design and course materials may be carried out to ensure comparability with national or professional standards. In the case of e-learning courses the evaluation process should address subject content, modes of delivery and levels of interactivity. For example:

- External assessors should be engaged to review course design and provide developmental feedback
- The monitoring and evaluation process should provide documented feedback for improvement and redevelopment;

- Whilst in presentation data on patterns of student use may be gathered and analysed in addition to evaluation information from formal survey activity.

In an e-learning situation there is the potential for generation of very extensive data on student performance, *etc* for quality improvement and the course design team should devise a strategy for exploiting this.

Irrespective of source of feedback course development and presentation schedules should provide appropriate allowance in time and resources for implementation of identified improvements.

Course materials and delivery technologies should be evaluated under realistic conditions of anticipated use that replicate both the equipment and connectivity used by students and the traffic volumes anticipated at central portals and course servers.

Indicators

At threshold level:

Course design and materials are subject to independent review and there is evidence that the course designers respond appropriately to reviewer comments

Course materials and delivery systems are technically tested under realistic conditions

There are appropriate feedback mechanisms in place for informing the improvement and development of the course

At excellence level:

The institution operates an independent review system whose results are used widely alongside its own feedback systems to inform and improve design of subsequent course projects

Professional management of all courses ensures that all materials are developed and tested using industry standard procedures for quality management.

Assessors notes for course design

Pedagogic Design

Information and Communications Technologies have opened up a range of pedagogic possibilities that present challenges for teachers engaged in both campus based and distance learning sectors. The pedagogic uses of ICT can be grouped into three broad categories.

Delivery of interactive teaching materials supporting a didactic approach

Access to information sources supporting resource-based learning approaches

Collaborative learning activity in which electronic communication tools support group centred learning

An institution's ability to exploit these will be strongly dependent on its existing systems and approaches. Incremental introduction of e- learning techniques may have developed by offering ICT based pedagogic tools alongside their traditional counterparts. For example a distance learning presentation of a course may have its initial origins in experimentation with the distribution of lecture notes via a website, with later developments enabling on-line access to tutorial support to the distance learning students *etc.*

New e-learning programmes should regard e-learning methodologies as their prime pedagogic tools rather than parallel additions to other pedagogic components and institutions should display confidence in their utilisation.

Whilst highly structured e-learning software may be effective as a mechanism for procedural training in the commercial sector; at Higher Education level few programmes will achieve their goals through use of a single technique. The majority of programmes will deploy a number of e-learning applications with communications tools facilitating contact between learners and some human source of learner support.

Delivery of teaching materials

The use of electronic means to deliver teaching materials has reduced the logistics barriers to entry into distance learning activity, however it is important to distinguish between issues of convenience and effectiveness.

Electronic delivery may offer 24x7 access to teaching materials but the same can be said for paper based systems, so pedagogic justification for the use of e-learning should rest on the unique advantages of e- systems *viz*: interactivity, adaptive study routes, animation, embedded assessment *etc.* These are features that justify e-delivery rather than the convenience of delivering text material to be, in all probability, printed locally by students.

Course designers should be able to demonstrate that they have maximised the potential for interactivity in their materials, are aware of what is technically possible, the likely costs, financial and academic, of its development, and are aware of the availability of external sources of on-line materials.

Access to information resources

The development of the internet as a readily available information source and the extensive use of on-line resources by university library services has opened up the

possibility of students pursuing on-line or distance learning studies enjoying services virtually identical to those available to on campus students. Hence the pedagogic rationale for use of on-line information may, in most circumstances demand little justification. However there are issues associated with journal subscriptions and licences with regard to off campus and international students. Connectivity costs may be an issue for students.

Collaborative working and communication tools

The use of communications and collaborative working tools have enormous impact in providing support and academic community building for distributed student populations. Their effective use can be a make or break factor in the success of individual students hence course designers should devote considerable attention to their design and use.

Student support

Provision of human on-line student support from a tutor/mentor/advisor is identified as a key factor in improving student completion rates in electronically delivered programmes and is offered by the majority of institutions offering e-learning programmes. Course designers should have a clear view of the role of the support mechanisms they adopt, for example balancing the advantages of continuity of support from a named individual with the implicit limitations of availability at particular times.

Provision of learner support via written and occasional telephone contact from a named individual found in "traditional" distance teaching universities does not sit comfortably with the 24x7 help-desk support prevalent in the online commercial world.

Designers must establish:

- those elements of support requiring personal continuity and those for which speed of response is paramount.
- which support functions are fulfilled through synchronous and which through asynchronous routes as a distinction that is technologically based (eg telephone support = synchronous, on-line = asynchronous) may be challenged by changing technologies

Collaborative activity:

Electronic communications tools have created new opportunities for collaborative activity and community building in distance learning programmes and done much to reduce the distinction between distance and on-campus programmes. The course design team should review course specific learning objectives and their role in achieving wider programme objectives that relate to collaborative working, project based activity and interpersonal skills in order to establish their use of collaborative tools.

Collaborative tools that allow document sharing, and provide synchronous and asynchronous communications may be essential for project based courses.

Synchronous and asynchronous conferencing tools may provide the structure for enabling the development of an informal on-line student community (with intersecting and parallel staff communities).

Course design teams should be well-informed on what is available to them and technically feasible and make reasoned decisions on activities that are essential, desirable and those of marginal importance to successful achievement of their learning outcomes. Provision of tools for student community building may be an example of the latter category where the benefits may be evident at institutional rather than course level.

Balancing the blend

If it is not possible to deliver learning outcomes solely through e-learning then use of face to face techniques are widely adopted, for example for development of practical skills, interpersonal group skills, group identity in collaborative projects, to introduce students to their on-line tutor and fellow group members, *etc.*

In general staff will have greater experience of face to face techniques but there should be no assumption that familiarity drives decision making. Justification of face to face activity should have the same level of rigour as that of the e-learning components.

Assessment

Design of assessment policy is an integral component of the pedagogic design hence the design team should ensure that wherever possible the assessment strategy is a direct extension of its teaching strategy. The interactivity inherent in electronic materials and delivery methods provides scope for embedding formative assessment components within course materials.

If conservative institutional policies require assessment solely through traditional modes then course designers should ensure that their students are not disadvantaged by lack of experience or practice in the skills and techniques demanded by their examination and that the examination process fully addresses the learning outcomes deliverable by e-learning.

Staff skills and training

Those involved in the course design process require experience of e- learning and its capabilities. In a rapidly evolving field much of this experience is gained through project participation rather than formal qualification. Academic teams may seek injections of experience from media professionals particularly to inform them of the current capabilities of delivery systems. Well managed institutions will implement formal staff development activity focused on the use of e- learning systems. There are well developed programmes introducing the techniques applicable to on-line student support and group management but much less coverage of topics in course and programme design.

Course Design

The course design process should demonstrate a rational progression from establishing the role of the course within the overall curriculum and its outline pedagogic strategy through the design of a conceptual framework to the detailed development and production of course materials.

It is to be expected that the process will take place within an institutional framework for course approval. Institutional processes designed for face to face provision may

not necessarily fit well with decision points appropriate to e-learning course development.

Conception

The design process requires input from academic and media specialists to ensure that the full capabilities of e-learning are harnessed to support student learning. The task of the conceptual design team is to produce a specification that may serve a number of functions. It may:

- Mark a significant decision point in institutional course approval and resourcing processes
- Provide an outline specification for commissioning the development of the course by a team within the institution or under the auspices of a consortium agreement
- Provide an outline specification for the development of a course, or components of it, by an external agency.

The conceptual specification should provide information on:

- The role filled by the course within the curriculum
- The level and size of the course (expressed as credit points and student workload to assist interchange between credit systems)
- The knowledge and skills profile of intended students
- The knowledge and skills to be taught within the course expressed in terms of learning outcomes
- The pedagogic techniques to be used in the course
- The planned use of media in the course, an allocation of student workload and development resources, human, technical and financial.
- An assessment strategy defining the role of formative and summative components
- Identification of the contributions expected from individual academic contributors.

If approved the conceptual plan will form the basis for further expansion and detailing by an expanded team during the analysis phase

Analysis

This stage of development requires a detailed analysis and elaboration of the specification developed and approved at the conclusion of the conception phase.

It is envisaged that this task will be undertaken by the team constituted for the development and production of the course.

The output should:

- Detail the academic content
- Provide detailed learning outcomes
- Provide a specification of student activities throughout the course
- Allocate content components and media use on a section by section basis

- Breakdown anticipated student workload between components
- Allocate course development budgets on a section by section basis
- Assign responsibility for the design of course content to academic authors and media designers

This specification should be sufficiently detailed for a project manager, whether acting for the institution or a consortium, to put in place detailed project management and resource allocation plans.

The boundaries between conceptual and analytical phases will vary with institutional context but the following sections discuss some of the factors that will influence decision making on e-learning.

Role of the course:

It is assumed that an overall programme design will allocate subject topics and skills development to courses within the programme that will influence and constrain course design. A strategy of progression towards independent learning through the programme may require courses designed for study early in the programme sequence to adopt a predominantly didactic approach with a transition to project centred learning in courses occurring later in the programme.

Level and size of the course:

Course designers must assess whether they can realistically deliver their learning objectives within the constraints of level, size of course and methods available to them. Estimation of student workloads is a complex task when the curriculum is delivered using innovative methods. Course teams should demonstrate that this factor is adequately researched and that they exploit information available within the institution and elsewhere.

Student prior knowledge and skills:

E-learning courses may be targeted at student audiences new to an institution. Decisions should be informed by research of the audience to establish prior subject knowledge and study skills. Course designers may have to address the development of new learning skills in the early phases of a course. Learners may need to adapt to modes of independent study or resource based learning, and design teams should consider allocation of learning resources and study time to this.

Learning Outcomes:

Learning outcomes must be achievable using the teaching methodologies envisaged and should not be simply those outcomes inherited from a predecessor conventional face-to-face course. Teams must be clear as to whether demonstration of achievement of outcomes is dependent on ICT, this is particularly relevant to assessment and examination processes but is also relevant to students' future careers. Separation of subject knowledge related outcomes and professional skills outcomes may be valuable in analysis of whether the use of ICT is a core component of the course or a delivery medium.

Pedagogic Techniques:

The conceptual design should define the broad use of the pedagogic opportunities which e-learning provides such as didactic, resource-based learning, collaborative learning, *etc.*

The majority of courses should be expected to use a number of techniques.

Media Selection:

The design team should implement a clear policy for use of the media available to them. Inputs from media and pedagogic specialists should support academic subject specialists in this process and there should be evidence of the dialogue between groups. At the conceptual design stage an indicative allocation of media resource to teaching functions should be made and this should relate to estimates of student workload.

Designers should be explicit at this stage as to whether their use of ICT is for distributive purposes, *ie* an activity can be conducted from text print out of the materials delivered electronically (an indicator would be extensive use of PDF files), or whether the material will provide high levels of interactivity, (an indicator would be materials designed in a web page format with many active links embedded in the teaching materials).

Adopting a highly interactive computer based teaching approach requires a high investment in software design in order to provide extremely effective didactic teaching with extensive opportunities for students to explore and test their understanding. Well designed software should provide remedial loops to address well known conceptual difficulties.

Use of audio and video resources presents the need to distinguish between pedagogic and logistic functions.

Are the resources intended to extend and enrich teaching primarily presented through text or lecture styles of delivery, or are they intended to provide an alternative to experiental learning activities such as laboratory classes or field trips?

Course designers should appreciate the logistic options for distribution of audio-visual resources. For example streaming techniques may limit student choice of place and time of study, distribution on disk places increased logistics demands on the course provider, *etc.*

Contributors:

It is presumed that the majority of courses are produced through team processes rather than individual authorship. The conceptual plan should indicate the contributions expected of individuals to aspects of course development and, in circumstances where team members are drawn from more than one department or institution, should form the basis of subsequent agreements regarding staff contributions.

If the course is to be developed in a consortium arrangement the conceptual specification should be approved at consortium level; either the responsibility allocated to a single institution for ongoing management of development or alternatively, commitment of institutional contributions to a development project progressed by a team working under consortium management.

The involvement of consultant subject experts demands careful role definition. Is the consultant to provide solely subject knowledge to be converted by pedagogic and media specialists or will the consultant work alongside the media professionals?

Effective briefing of consultants on their role, the tools and support available and a clear understanding of what will happen to their work on completion of their contracted task is important.

If course contributors are newcomers to the development of e-learning or to team development processes the provision of training and team development activity may be a feature of the course development project plan.

Assessment and Examination.

The course design team must specify an assessment and examination plan that fulfils the requirements of the benchmark statements. The major issues to be addressed are:

- Exploitation of the interactive capabilities of ICT systems
- Separation of knowledge and skills components
- Clarity on the formative and summative functions of continuous assessment
- Clarity on the summative and security functions of any end of course examination

The development team should endeavour to exploit the interactivity inherent in ICT systems, particularly through formative assessment activity, to confirm and reinforce student learning. We are all accustomed to the use of applications software offering context specific help, spell and grammar checking in word processing packages *etc* yet much e-learning relies on simple multiple choice question routines with extremely limited feedback as it's core assessment methodology. In institutions aspiring to excellence academic and systems staff should demonstrate a commitment to the development of high quality interactive assessment tools

Formative assessment may be built into the design of structured teaching materials. It is possible to allow students to progress only when they have achieved acceptable levels of mastery of a topic. Such an approach might be regarded as inappropriate in the HE environment, - nevertheless teams should determine how they make use of the interactive mechanisms available to provide students with feedback or remedial teaching in response to their answers.

VLE systems through which e-learning programmes are delivered have the ability to track those resources accessed by individual students hence it is possible for course designers to build detailed models of the patterns of use adopted by students and to tailor assessment to be adaptive to student study path. For example if there are optional sections within a course, an adaptive system could ensure that tests covered the options actively studied by a particular student.

Balance between continuous assessment and examination should be given careful consideration. Continuous assessment provides structure and pacing targets for students but may not provide the discrimination between students' performance which fixed time examinations achieve.

As verification of student identity is an ongoing concern for e-learning administrators, there should be evidence that design teams have addressed the issue thoroughly identifying the opportunities and methods to establish and cross check identity. Course tutors and mentors may have a role in this.

Attendance at examination has been used by distance teaching organisations as a secure means of checking identity and institutions may view significant disparities in performance between continuous assessment and examination with concern.

It has to be recognised that e-learning students are likely to have greater facility with the keyboard than with the pen, hence examination processes that adopt a traditional three hour written format may not fully test the skills used and acquired during study. For example, writing at a keyboard allows outlining or mindmapping tools to be used to structure an essay, an accomplished user of these tools may find the preparation of an essay in traditional exam conditions to be a more time consuming process.

The use of ICT tools has shifted the emphasis from the importance of acquiring and holding knowledge to the skills of accessing and manipulating information hence assessment and examination processes should recognise this. There is thus an inherent tension for institutions operating remote e-learning programmes between the importance of examination as an identity-checking process and the construction of examinations that address appropriately the knowledge and skills developed in the course.

Content Criteria

The design and presentation of course content is a major component of students' learning experience. The course development team must evolve a style of presentation that fulfils academic requirements whilst displaying standards expected by a student audience that has extensive experience of electronic media in other aspects of their lives.

It is assumed that the content of courses is developed by academic staff appropriately qualified for their academic role who are supported by media professionals who have the expertise to translate academic requirements into the teaching media with which students will interact. Successful management of the interface between the two groups is dependent on mutual understanding of what, how and why information flows between them.

The academics' outputs may be:

- Text for transformation into web formats
- Story boards and teaching schemes for transformation into computer based learning
- Web references and links for transformation into resource based learning schemes.
- Tasks and assessment parameters for collaborative learning activities.

The precision required for these documents is dependent on the nature of the working relationship between academic and media professionals in the subsequent phases of development. Greatest precision is to be expected for work contracted to external design organisations.

The content of the course should meet the academic standards required for its level, volume of study *etc.* Given the sequence and timescale of the development and production process, inputs may be required from external assessors even though materials are in an unfinished state. The assessor's response should address the appropriateness of academic content and comment on the overall teaching scheme.

It is reasonable for media professionals to expect the materials provided to them to be accurate in their academic content and not to be subject to change for academic reasons, although iterations to refine the presentational aspects are to be expected.

Collaboration between academic and media professionals should be evident through clear specification of the pedagogic uses of ICT and a set of tools and protocols for their implementation.

If the development of teaching media is to be contracted out to external agencies the relationships between institution and media developer should be clearly defined through contract. Codes of practice, such at that implemented by British Learning Association http://www.british- learning.com/qualitymark/index.htm provide a quality framework that addresses the processes of contracted e-learning materials development.

There are criteria that relate to the structure and design of the course and others that relate to the individual components or student tasks.

The broad pedagogic approach and the tools used should be presented to students at the start of the course so that they can prepare and plan their study programme appropriately. For example it should be clear which components of the course require on-line interaction, which require synchronous on-line communication, which can be studied in either on-line or off-line modes *etc.* This information may be presented to students in an introductory Study Guide.

Design of the Study Guide might be applied consistently across a programme or more widely across the institution providing students with a common introduction to each course.

Use of icons will assist in usability.

At detailed level:

- Interactivity is a key distinction between paper-based and screen-based activity hence teaching materials should exploit this for teaching, self assessment and reinforcement wherever possible.
- Text components intended for onscreen reading should be appropriately structured and styled and designed around short concise sections.
- Text components intended for extended reading should be provided in pdf formats to facilitate printing for off screen study.
- Interactive exercises should provide facilities for students to enter and recover their responses on-line rather than assuming that students will maintain an independent paper based record of their responses.
- The function and use of AV media should be clearly defined for students indicating whether they are for contextual illustration, provision of evidence, *etc.*

Courses that are reliant on external sources accessed through web links are vulnerable to changes in the content and location of external sites. Course authors and their professional colleagues should ensure that external references are updated consistently, that potentially volatile sites are cached in the format that the author makes reference to and that all issues concerning Intellectual Property rights are professionally cleared.

If external assessment of the content is required prior to sign off for release it should be a requirement that the assessor conducts the review using an equipment set and connectivity of the minimum level that students are required to have access to in order that the review is a true reflection of the experience provided to students.

Materials and Production Design

Technical and Interface Design

These factors cover those aspects of course materials that relate to their appearance on the screen, the on-screen facilities for accessing course components, information resources and student support services.

Significant contribution from media professionals is to be expected in this sphere of activity to support the objective of developing materials that meet the standards and norms of other areas of on-line activity that learners will encounter in other aspects of their lives.

It is expected that policies will be established at institutional level and guided by professionals who monitor evolving technical developments and standards.

Compliance with National and European legislation and codes of practice relating to accessibility is essential and should be addressed at institutional level providing individual course development teams with clear direction and tools.

Standard formats provide consistency for students who will probably study a range of courses as they progress to qualification. Divergence from standard formats must be justified on functional requirements rather than as a matter of personal preference by course authors.

The use of an institutional Virtual Learning Environment, or equivalent systems, should provide course teams with a choice of standard screen layouts and interface tools around which to design their course screens.

Fonts, standard buttons, colours and colour changes should be consistent within a course and a consistent visual "grammar" should be indentifiable in all courses.

The systems, should wherever possible be platform independent, and allow for easy transfer of information between the e-learning systems and the general purpose software packages that students are likely to use for their social or work related activities. For example messaging systems should allow for forwarding to other e-mail systems, timetabling systems should link to organiser systems *etc.* Students may have invested considerable time and effort in mastery of their personal or working systems and use of an institution-specific tool that has similar functions may be an unnecessary irritation.

The technical design of the course materials should take due account of student circumstances and not make undue demands on student time or finances by requiring long download periods, printing of large documents or time restrictions on the availability of on-line resources.

Regular surveys of students on their ownership and access to equipment and software will inform institutional decision making on technical aspects.

Similar technical factors relate to the tools available to tutors and others involved in student support activity. Ideally a student assignment generated using desktop package A should be routinely transmittable through the institutional system for marking and annotation by a tutor using desktop package B and be returned fully readable via the same route.

Institutional managers should manage the creative tension between academic and technical contributors. From the academic side pedagogic challenge should be expected as a driver for system development and from the technical side a conservative concern for design and delivery of reliable systems. Evidence of this might be expected in policy making fora and updates of the system to provide additional facilities.

Content Criteria

In the design and production phase the academic content as designed by academic members of the team is transformed into the material that students engage with directly during their study.

The task of the media professionals is the enhancement of teaching through effective design without compromise to the academic integrity of the material presented to them by their academic colleagues.

Technical standards are addressed through several international projects and it is to be expected that the institution will have policies in place with regard to compliance with such standards. Adherence to standards should enable exchange of course materials between courses and, possibly, between institutions. The development of repositories of resuable teaching objects has long been postulated as the key success factor for the widespread adoption of e-learning. Currently their use is limited, possibly because standards have yet to consolidate. Institutions may specify that their content should wherever possible be designed with re use in mind.

Operating within the general style and functionality guidelines outlined in the technical design section designers will develop the teaching schemes prepared by academics into formats appropriate for final delivery.

The quality of the outcomes can be assessed by examination of the resulting materials against the criteria presented in performance indicators, but is important that reviewers test functionality in addition to appearance of the materials and check for student feedback on the ease of use and effectiveness of the teaching materials.

Assessment of the value-added at this stage in the development process requires examination of the input sources and discussion with academic and media professionals involved on their contributions.

Process Management

This phase of activity will involve significant input from media professionals. The nature of the collaboration between academic staff and media professionals will vary dependent on organisational resources and policy. The extremes of the modes of collaboration are:

1 A linear sequential development with the following stages:

Stage 1

Course designed and content drafted by academic staff

Stage 2

Further developed by Instructional Designers

who elaborate and refine the pedagogic structure and

implement design of learning and assessment

Stage 3

Web and media production specialists

produce final materials for on-screen presentation

2 A fully integrated development team in which academics and media professionals are fully involved at all stages from initial course design to delivery of course materials.

However the most commonly encountered model is a parallel development model, the balance of workload transferring from academic to media professionals as the course design evolves.

Management of the interface between the two groups is critical to effective management of the project:

- Documentation for the various stages of course approval may mark the stages in the linear development of the course.
- Interdepartmental service level agreements, internal institutional codes of practice should exist to define the transfer of responsibility for material development between professional groups.
- A disciplined approach to version control and clean handover between professional groups should be evident.
- Should development work be contracted out to agencies external to the institution, formal specification of requirements and clear contractual arrangements are essential.
- The use of media professionals in a commissioning role is one mechanism for management of the interface between the academic staff of the HE institution and external media professionals.
- External e-learning developers may be accustomed to working in an industrial training environment and may expect a tighter specification of design parameters and outcomes than may be forthcoming from academic teams.
- Academics may be provided with training in storyboarding and other media specification techniques.

The interactive nature of e-learning with the consequent multiple study routes that may be pursued by students makes review and acceptance of materials at each stage of development a more complex task than the review of text based materials and this should be factored into project responsibilities and schedules.

Formal project management techniques should be evident at all levels form course project upwards. Hence in an insitution engaged extensively in e-learning development a course project will be operating in a tiered management system. Tiered project management will provide improved management of contingency and risk at departmental, faculty and institutional levels.

If the development of teaching media is to be contracted out to external agencies the relationships between institution and media developer should be clearly defined through contract. Codes of practice, such at that implemented by British Learning Association http://www.british- learning.com/quailtymark/index.htm provide a quality framework that addresses the processes of contracted e-learning materials development.

Assessment and Evaluation

This section of the course development process intersects with the pedagogic design of the programme and the assessment of student performance, the review of the

course during development, its acceptance as fit for purpose and evaluation of the performance of the course.

Student Assessment

Assessment policies are a key component of e-learning programmes as it must be expected that many students will not be pursuing programmes which provide the direct face to face contact with academic staff that characterises traditional campus based education. The assessment structure must address pedagogic issues and concerns of security and identity.

External Examiners may be involved in the assessment process to comply with national requirements. Involvement of the External Examiners throughout the assessment design process is recommended. Decisions on how and when to assess particular aspects of knowledge and skills development may be taken early in the e-learning course design process and may require justification to the examiner. Briefing an External Examiner on institutional policies and the assessment and examination processes of other courses would be an indicator of good practice.

Pedagogy:

Course design should provide opportunities for formative and summative assessment. Institutions operating distance learning systems have well established processes for combining continuous assessment and end of course assessment to establish measures of overall student performance.

It is widely accepted that continuous assessment itself fulfils both formative and summative functions with feedback from tutors/mentors on assessment tasks providing the learner with reinforcement or direction for remedial learning. Within a continuous assessment suite the relative importance of formative and summative functions may be blended to achieve specific pedagogic results.

Though some may assert that entirely formative assessment is of great value to students others adopt a more pragmatic view of human motivation and deploy assessments that are primarily designed to fulfil a formative function but reward completion by awarding a low tariff mark. Provision of feedback from tutors carries a financial cost directly driven by the number of student assignments submitted so may restrict use of purely formative assessments.

In traditional distance learning systems the value of tutor feedback is inevitably reduced by the time delay inherent in the communication loop. Use of e-communication will reduce the delay in comparison with mail based communication but instant 24x7 response can only be provided by automated systems.

The interactive facilities offered by e-learning warrant review of institutional policies and practice in continuous assessment.

Didactic teaching delivered through e-learning can be designed to provide high levels of interactivity and immediate student response driven feedback. For example:

- Each option within a simple multiple choice quiz may be associated with a short feedback message and reference back to the appropriate point in the teaching sequence.
- More complex teaching structures may incorporate remedial teaching loops in response to incorrect answers to interactive questions.
- Where mastery of a topic is required progression to later topics can feasibly be restricted until an appropriate level of mastery is achieved.

Thus the functions expected of formative assessment can be strengthened without recourse to the inducements of the reward of a score contributing to a continuous assessment score.

The ability to test and regulate progression at a detailed level may allow the substantive continuous assessment to focus on issues of integration of learning and allow tutors to focus on assessment of higher level objectives.

Computer-based assessment carries the advantage that assessment criteria are applied uniformly across the whole course cohort reducing the need for standardisation between, possibly, a large group of markers.

Institutions may also use computer based on-line assessment for summative purposes, but their use may raise issues of identification and security, that are interelated with aspects of flexibility in time, place and pace of study for students.

To improve security on-line assessments may be :

- restricted in availability to certain time periods
- generated from a bank of questions for individual students
- generated from a bank of questions and available over a particular time interval.

Concerns over the security of assessment in an on-line evironment should be tempered by realistic appraisal of custom and practice amongst students working in a collaborative on-campus environment.

The continuous assessment of e-learning courses that are predominantly resource based offers fewer opportunities for integrated computer based assessment and it should be anticipated that assessments will be tutor marked and learning outcomes will focus on information management skills.

Assessment tasks may differ from conventional essay based structures for example requiring the presentation of work in a website format. Course designers should ensure that marking schemes address and reward skills development and that course markers are trained in techniques of evaluating materials that are themselves interactive.

The issue of plagiarism is common between institutions offering on-line and conventional provision. Arguably its detection and management is easier in institutions where on-line submission of assignments is the norm as reference to the work of current and previous generations of students may be possible in addition to checks against internet sources.

Courses structured around on-line collaborative student projects compound the inherent difficulty of assessment of an individual's contribution to collaborative projects with the complexity of the (self) management of on-line team work. Assessment design should address group outputs, invidual contributions to the group outputs, individual use of group working tools and individual group working skills. Group peer assessment may be an appropriate input to the assessment process. On-line communication should allow a fuller and more detailed archive of the transactions than would be available in a paper group environment but use of such an archive raises issues of group confidentiality and of communication via other channels that is not recorded in the common archive. Dependent on the input that the tutor/mentor may make to design of the project activity or to the group process, joint or double marking may be desirable.

Examination.

A final written course examination has, traditionally, been regarded as the definitive opportunity to test a student's understanding of a course. In the case of distance teaching universities it has had the added function of providing evidence that the work is produced by a person who's identity is confirmed as that of the person registered on the course. An examination taken under controlled conditions may also be used to provide confirmatory evidence that exam and assignments submitted as continuous assessment have been undertaken by the same person.

The inherent uncertainty over authenticity of identity in online environment raises the desirability of some form of invigilated examination process at which a rigorous identity check can be made.

The options available to institutions range from computer based assessment using "clean" equipment in a controlled environment (this approach is used extensively in the training arena for the commercial certification of software professionals with online examinations being conducted in registered test centres) to traditional format *viva voce* examinations that may be used to demonstrate that previously submitted works were truly those of the candidate.

The intermediate territory, which might involve student access to internet resources or use of their own equipment, is fraught with problems of invigilation.

In addition it can be argued that many of the higher level skills now formally expressed amongst the essential outcomes of HE programmes are not readily assessed under conventional examination conditions.

Institutions must assure themselves that they are confident of their graduates' identity and performance. Their policy frameworks must define the requirements for examination under controlled conditions to verify student identity.

Policies relating to verification of identity may be dependent on the extent of programme modularity. Policies may:

- determine the proportion of courses that must be subject to a controlled examination
- stipulate the number of occasions that an individual student must be subject of a controlled examination in progression to an award
- establish a level of sampling by which students may be called for a controlled examination

However the issue of what examination task should be undertaken under the controlled conditions is more complex in circumstances in which the student is accustomed to the use of online tools and resources. It is unrealistic to require students to generate traditional essays under examination conditions if they have not been required to do so in the body of their course.

Examination tasks may replicate the style of assignment previously undertaken by candidates during their course. The outcome of the examination process might then provide confirmation of continuous assessment performance.

Examination tasks may be designed to assess particular integrative skills that are additional to those assessed during the continuous assessment. : The outcome of the examination process would then provide additional information to that provided by continuous assessment.

Students should be informed of the detail of the structure of the examination and the learning outcomes it is designed to assess, and be broadly aware of the role of the examination as an identity control, particularly in those courses where a sampling procedure is implemented.

Course evaluation and approval

The processes of evaluation should be integrated with the course development process. Evaluation and acceptance processes should embrace both the initial development, to ensure that the course is appropriate for launch, and the use of student and other feedback in the ongoing development of the course, presentation by presentation, to ensure ongoing improvement of the course. *Viz*:

Development Phase:

- External assessment by academic peer reviewers
- External assessment to ensure compliance with professional body requirements
- Internal review by academic peers
- Internal assessment for compliance with institutional standards and norms
- Internal quality assurance review processes.

Ongoing presentation:

- Evaluation of formal feedback from students
- Evaluation of course performance via collection of on-line usage data
- Evaluation of formal feedback from tutors/mentors etc
- Evaluation of student performance
- Periodic Internal review processes

Development Phase

Peer assessment by external academic reviewers may be a requirement for all courses irrespective of mode of delivery. In the case of e-learning courses there are specific issues relating to the mode in which the materials are presented for review.

The review process may be multi stage reflecting the stages in the development process. The institution may provide its external reviewers with briefing notes on:

- the development process,
- the nature of documents and other materials that they will be required to work with
- the characteristics of the proposed methods of delivery.
- exemplars of previously developed course materials as benchmarks of institutional standards.

External review by professional bodies may relate predominantly to the subject content though in some instances an e-learning course may be set precedents in its mode of delivery. Provision of exemplar materials from related subject areas may be used as a mechanism to inform reviewers of the capabilities of e-learning delivery.

Internal review processes will vary with the academic and development cultures within the institution. Institutions with a longstanding culture of team development are in a position to modify these to the requirements of e-learning. Those institutions embarking on development of e-learning from a background of face to face delivery may introduce formal internal academic review processes amongst other measures to ensure sharing of experience and the implementation of common academic standards.

The institution may implement quality standards relating to course materials and delivery systems that may be derived from commercial practice for software development and testing. This process should be managed by media professionals who have the authority to approve the technical quality of the materials and systems.

Saturation testing of on-line delivery and support systems may be used to confirm that systems can cope with envisaged peak demand *eg* at assignment submission deadlines.

A "dual key" acceptance process may be implemented to ensure that courses are appropriate for delivery with formal sign off by academic and media professional divisions of the organisation.

Ongoing Presentation

Presentation of e-learning courses should be monitored to ensure maintenance of quality and provide information for improvement and future development.

There should be no shortage of information on course performance but the challenge for course teams is the use they make of it for quality improvement during presentation, for subsequent presentations and the development of future courses.

Student response to materials can be measured subjectively through the use of feedback surveys. Design and frequency of survey may allow for sampling of immediate response on a section by section and a more reflective response via end of course survey.

A fully objective view of student use patterns may be obtained by monitoring records of student access to the Virtual Learning Environment.

Though it might be techically feasible to monitor every student keystroke, more appropriate parameters for measurement include:

- the number of occasions an item is accessed,
- the time spent on each item,
- the number of attempts at test items,
- the frequency of response to each item in multiple choice tests.
- The frequency of use of links

Similar monitoring of student use of on-line tools for on-line resources (library use *etc*) and collaborative working is possible.

There are ethical issues surrounding the use of information gathered in this way or via the monitoring of student opinion as it might be expressed in discussion strands in on-line discussion space. Institutional policy should be clear on how this information might be used to reassure students that monitoring may contribute to overall statistics but not impact on their individual assessment.

Additional information on course performance is available from those working with students as tutors/mentors. Their feedback will relate to their own workloads as well as providing additional contextualisation for student feedback and performance statistics.

System derived information allows for performance monitoring of tutors/mentors and correlation with the performance of their students. Again, policies on how analysis of this information might be used in individual performance review and management should be clearly stated. For example:

In the short term (*ie* within a presentation) on-line monitoring may identify "rogue" items such as incorrect quiz or assessment items that can be rectified immediately.

In the medium term (*ie* next and subsequent presentations) a presentation review and report may focus on questions such as:

- did the course perform to its planned specification in terms of student learning outcome and workload?
- did students respond to the course in the way expected?
- did they respond uniformly to all aspects of the course?
- is there a need to change the balance of course components?
- how are these issues addressed for the next presentation of the course? *Eg* through modified materials, changed assessment pattern, or modified provision of tutorial support.
- What is the mid term development policy for the course?

In the long term quality improvement may be addressed via a periodic review that reflects on the experience of several years of presentation feeding into a comparative review of courses at a departmental/faculty or institutional level. External participation in these reviews will facilitate exchange of best practice between institutions and the development of a strong community of practice amongst HE teachers engaged in e- learning.

4 Course Delivery

This section covers the technical aspects of course delivery, the interface through which students receive their course materials and communicate with fellow learners and staff.

The systems represent a very significant investment of financial and human resource for acquisition and implementation and the selection of a particular system may influence teaching developments for many years.

Effective course delivery requires collaboration between academic and operational divisions of the institution. Technical infrastructure should serve the requirements of the academic community, both students and staff.

Policies on the implementation of a virtual learning environment to manage delivery processes should be driven by educational requirements and performance monitoring should embrace the impact on learning as well as the operational statistics.

Benchmarks

1 The technical infrastructure maintaining the e-learning system should be fit for purpose and support both academic and administrative functions. Technical specification should be based on a survey of stakeholder requirements and involve realistic estimates of system usage and development.

2 The reliability and security of the delivery system should have been rigorously tested beforehand and appropriate measures should be in place for system recovery in the event of failure or breakdown.

3 Appropriate provision needs to be made for system maintenance, monitoring and review of performance against the standards set and against improvements as these become available.

4 The Virtual Learning Environment should be appropriate for the pedagogical model adopted and for the requirements of all users. It should be integrated with the institution's management information system as far as possible.

5 The VLE should provide information and services to all users in a logical, consistent and reliable way. All users should be confident that the VLE's systems for communication and provision of information are secure, reliable and, where appropriate, private.

6 Materials and information accessible through the VLE should be regularly monitored, reviewed and updated. The responsibility for this should be clearly defined and those responsible provided with appropriate and secure access to the system to enable revision and updating to occur.

4.1 Technical Infrastructure

Effective delivery of e-learning requires the institution to acquire, operate and maintain a computer network capable of distributing of e-learning materials to students, maintaining and updating records of student performance, conducting aspects of e-business with respect to student fees etc, facilitating communication between the institution, its students, central staff and affiliate staff.

The system must be capable of operation to standards commonly encountered in the commercial world in terms of availability and capacity to cope with anticipated business flows.

This section does not pupport to offer detailed definitions of the services offered or the technical specifications.

4.1.1 System Design and architecture

The design and architecture of the institution's technical infrastructure may be a key factor in successful delivery of e-learning programmes demanding significantly greater capacity and capability than the technical infrastructure required to support campus based students or research programmes. The institution should have a strategic plan for technical infrastructure for e- learning, its management and development.

Intitutional systems are one aspect of the delivery system, the other major factor being the facilities owned or accessed by its target student audience, hence institutional decisions may be influenced by projections on the nature and use of on-line services offered by other organisations with whom their students interface.

Hence socio technical foresight activities should play a major role in informing institutional decision making.

The institution may choose to work in consortial arrangements with other institutions or to outsource provision of its technical infrastructure. In either circumstance it should satisfy itself that the arrangements will provide effective service for students and staff.

The institutution should endeavour to adopt a stategy that provides flexibility to allow for increases in demand and the emergence of new technologies and patterns of use.

Indicators

At threshold level:

There are clear operating standards and management processes

Operating standards are implemented effectively

Contractual relationships with partners/outsourcers are in place and well defined

At excellence level:

The strategic plan defines current and future needs of the institution

The institution will undertake regular technical foresight activity to inform decision making

4.1.2 Technical Infrastructure

The technical infrastructure should be designed,managed and maintained to ensure that it meets capacity and availability targets.

These are predominantly issues of professional management of infrastructure services and standards of performance should relate to those encountered in other customer service organisations such as banks, insurance companies that offer their customers on-line services.

Staff responsible for these functions may have performance targets and reward systems that may relate to those encountered in the service sector.

There may be a clear separation of responsibilities for management of the e-learning infrastructure from other aspects of the institutions infrastructure relating to research or administration

Indicators

At threshold level:

There is sufficient server capacity to handle the planned usage.

Connectivity issues do not restrict or disrupt learning.

The technical requirements of the system are monitored on a regular basis.

E-learning requirements are integrated with the longer term IT infrastructure plans of the organisation.

At excellence level:

The institution sets standards for the operation of its technical infrastructure that are benchmarked against other major on-line customer service providers

The future planning of technical infrastructure for e-learning is the major determinant of organisational ICT planning

4.2 Virtual learning environment

The term Virtual Learning Environment is used to describe the collection of systems required to manage the on-line learning process.

The systems allow for management of all processes from course authoring to delivery of the course materials to students and recording their performance.

The system requires integration of many pre existing systems within an institution. Some institutions may chose to implement a VLE by an internal systems integration project.

Increasingly institutions are purchasing commercial systems that may be modified to suite institutional requirements.

This section describes aspects of the functions carried out by the VLE, it is not checklist for VLE functionality.

4.2.1 Learning Platforms and Management Systems

The core of the virtual learning environment is the system that undertakes the delivery of e-learning materials to students. Its facilities influence the nature of teaching and student interactions that can be offered and impact on the work of course designers and students.

There are international bodies determining standards for these systems and it is inappropriate for this document to attempt to duplicate their work. However compliance with emerging systems of standards will be a key factor influencing the choice of system adopted by an institution.

Hitherto many institutions operated "home grown" learning platforms, often with their origins in a single department. For most institutions the operation of such systems is no longer a feasible option. The choice that they face is that of :

- buying a system from a commercial provider that is managed in-house
- buying a managed system from a commercial provider
- operating, managing an open source system (and contributing to the development community)
- joining a consortium that has itself opted for one of the above options

The linkage between the Learning Management system and the institution's administrative systems must operate effectively

Indicators

At threshold level

The systems providing access to e- learning are appropriate for the type of learning and the requirements of learners.

The technical facilities of the e- learning system are compatible with the learning management processes.

The system provides robust privacy, and this applies to the personal domain, support, advice or guidance *etc* in addition to security of academic and financial transactions.

The e-learning system and resources demonstrate ease of use for the full range of target users, including people with disabilities.

Physical and virtual environments are selected to contribute to the efficiency of learning and to reflect the needs of target users.

Provision of the e-learning platform is protected by robust contractual arrangements and contingency planning

At excellence level

The e-learning system has the interface and technical facilities to meet current and planned needs and these aspects are under constant review in the light of technical and pedagogic developments

The institution contributes extensively to the development of e-learning systems.

4.2.2 e-Learning Materials

E-Learning resources should be selected to meet the requirements of target users (learners and teachers) and the providing organisation. The e-learning system address the needs of users for easy access and high quality interaction with the learning materials.

There are a number of standards relating to the description and indexing of e-learning materials,(prerequisites,content, learning outcomes, student learning styles etc), that are intended to facilitate the interoperability of learning materials across delivery platforms . Compliance with these standards may provide the precondition for exchange of learning materials between departments and insitutions.

The Virtual Learning Environment should enable students to interact with all features of the learning materials as intended by the course developers without degradation of intended functionality or interactivity.

In circumstances where students do not have routine access to good connectivity the institution makes use of hybrid systems in the delivery of materials eg materials that have dynamic graphics or video content are distributed via DVD rather than streamed.

Copyright and licence arrangements are protected and managed effectively and any limitations on the use of third party materials are implemented.

The organisation's approach and policy on interoperability of resources and adherence to technical standards contribute to the effectiveness of the system

Indicators

At threshold level

The content is credible, accurate and up to date.

Learning materials are designed/selected on the basis of identified needs.

The content is presented in a learner-oriented fashion.

Policies for delivery of materials are consistent with the technical infrastructure available to students

The e-learning materials exploit the opportunities for interactivity inherent in e-learning systems

E-learning materials are delivered via the VLE without loss of interactivity or other features.

There is a structured system for securing and recording the rights necessary for use of third party materials in teaching materials

At excellence level

E-learning materials are consistently compliant with IMS or other international interoperability standards

The institution has in place policies for internal reuse of materials and is active in the import and export of materials between instituions

4.2.3 Information Requirements

There should be clear information available to students and other interested parties on the main aspects of the course: its size and level, subject content, relationship with other courses, mechanisms for dissemination of course materials, assignments, assessments and evaluation tests.

Information may be extracted to suit the needs of differing audiences and modes of presentation. For example, information for prospective students, study calendars and course guides for enrolled students, authors of other courses who may wish to reuse materials, system managers and student support agents.

Indicators

At threshold level:

Students contemplating study by e-learning are adequately informed of the courses available to them and the requirements for study

Learners are provided with full information on sequence, timing, options within their intended programme of study

Details of course delivery are provided to learners and staff in a clear and accessible way

Relationship between different actors (teachers, tutors, etc) involved is specified and clear to learners

The provision of information is managed consistently at programme level

At excellence level:

The institution has a comprehensive policy for the provision of online information to prospective and current and former students

There are institutional templates for the presentation of information and these are adhered to by all programmes and courses

There is clear responsibility for overall management of information provision across all programmes

4.2.4 Updating and revising the e-learning system

The e-Learning provision should be monitored and managed on a continual basis to ensure its effectiveness. It should be evaluated and updated on a planned and appropriate basis.

Monitoring should cover both the detailed operational aspects of system performance, availability, capacity utilisation, user error reports etc but also the performance of the human support systems.

Student surveys administered on-line, routinely as part of courses, by random selection should be augmented by consultation with the student body regarding the effectiveness of the system. This information should be used to inform future development

Indicators

At threshold level:

Management of the system conforms to the organisation's policies and procedures on confidentiality and data protection

The technical aspects of the course delivery system are appropriately managed

Performance of supporters and moderators is monitored regularly

Problems and issues are acted upon promptly

Longer term improvements are identified

At excellence level:

Provision is evaluated and updated on a planned and appropriate basis

There is an institutional policy of performance analysis and survey that informs future developments

4.2.5 On-line assessment

Delivery of and response to on-line assessment is a primary function of on-line learning environments.

Assessment may be tiered to provide online formative assessment and summative assessment.

On-line systems are capable of delivering assessments in a range of styles and providing remedial teaching in response to student error.

The system should be designed to do this effectively and provide effective feedback speedily linking with other support mechanisms wherever possible.

For assessments that are essentially conventional in format, *eg* essays, but submitted on-line, security in transit between student and marker, quality of the marking tools and detection of plagiarism are technical aspects that should be professionally implemented and monitored.

Students should have access to their up-to-date assessment record at all times

Indicators

At threshold level:

Assessment methods are appropriate to the programme and topic.

Learners are informed about the conditions and outcomes of the assessment before and after completion.

Appropriate arrangements are made for security of assessments.

Data protection and privacy procedures are in place.

Feedback is relevant, contains appropriate depth and is timely.

Progress details should be available to the individual involved.

At excellence level:

The institution invests in the development of on-line assessment techniques.

There is evidence of research and development of on-line assesment tools and the dissemination of these across the institution

4.2.6 Physical distribution

Though it is envisaged that the majority of learning needs will be met by on-line materials there are circumstances in which students may be required to use physical materials.

The institution may choose to meet the needs of students with access to different levels of technical infrastructure through the provision of some materials in a physical format, in doing so it should operate distribution systems that operate efficiently and do not further disadvantage these students

Use of physical materials may be designed into a course or may be implemented to cope with the needs of an individual student or to address an emergency situation affecting all students.

Indicators

At threshold level:

Routine despatch and delivery of course materials meets student needs in terms of time and cost

There is a contingency plan for provision of physical materials to meet individual student emergency needs, *eg* illness, loss of connectivity etc

There is a contingency plan for provision of physical materials to course populations in the event of malfunction of on-line materials, for example if streaming does not operate as anticipated.

Assessors notes for course delivery

Technical Infrastructure:

Infrastructure Strategy and Architecture

Operation of an e-learning system requires the institution to maintain a computer network that will allow for the distribution of the correct learning materials to the individual students, to maintain records of their progress and performance, their registration status, aspects of their financial standing with the institution, provide communication tools to enable them to contact tutors, participate in discussions etc etc. It is in essence a highly complex network, handling large numbers of users and requiring high levels of security on many aspects but open access in others. Professional design and management is essential but the system must serve the academic requirements of the institution. The academic and administrative divisions of the institution should work collaboratively in defining the requirements of the system and its capacity.
There should be flexibility in the design to allow for changing technologies, for example system connectivity designed to cope with text based conferencing would be challenged by large scale use of video streaming in teaching materials.
For some institutions it may be preferable to work in consortium arrangements with other institutions to achieve the scale necessary to warrant investment and management costs. Alternatively an institution might chose to directly outsource provision of services to another institution or a commercial provider. In either case the contractual arrangements should be clear on requirements and the service levels anticipated.
A full risk analysis should be conducted, and regularly updated, irrespective of the model of service provision.
Effective back up and disaster recovery services should be in place and preferably managed by a specialist service provider.

Assessors should be able to access documents relating to the above topics and should seek evidence of their updating schedules etc.

Technical Infrastructure Operation

Learners may have selected an e-learning programme because of the flexibility in time and place of study hence institutions offering e-learning must provide an effective delivery system capable of operating at a high level of availability, 24x7 is a likely goal, and provide sufficient capacity to meet the anticipated needs of learner traffic. The choice facing institutions embarking on a significant expansion in provision of on-line learning is that of extension and expansion of existing systems or of establishing a new infrastructure specifically tailored to the needs of e-learning delivery
The technical design of the system may be a straightforward technical specification task but maintenance of the service, provision of help desk facilities etc, may require significant changes in help-desk and other support services that the institution might currently operate to support students pursuing programmes operated to campus "office hours" schedules.

Hence assessors reviewing this area should focus on four aspects:

1 Requirements survey and analysis:

There should be evidence of a structured survey and analysis of stakeholder expectations of the performance of the system. Major stakeholder groups are academics, administrators, students, and those providing on-line tutorial support. Projections on usage should be based on institutional projections on student enrolments, the patterns of system usage envisaged by academics and students and realistic projections of technical developments in the equipment used by students to access the system

2 Design of the system:

The technical design should take account of anticipated usage, numbers of students, administrative transactions, download requirements. Realistic assumptions of student usage patterns *eg* prediction of peak periods such as assignment submission or downloads of essential material, should be used in estimation of server and connectivity requirements. Arrangements for backup, archiving and recovery should be specified as an integral element of the technical specification.

3 Operational management and efficiency:

There should be a clear set of standards for the operation of the technical infrastructure together with evidence of compliance with these standards. Key Performance Indicators such as system availability, down-time, queuing time for access etc should be monitored and available for review.

4 Provision of help desk and technical and other support facilities:

The institution should provide a technical help desk service to support students in their use of the system (as distinct from help associated with the academic content of the courses). This service should be available at the times when students use the system and with support provision broadly matching student usage rates.

Virtual Learning Environment

Learning Platforms and Management Systems

The Virtual Learning Environment provides the software system that acts as the interface through which students access their e-learning. It provides students with access to:

- their course materials,
- library and information resources,
- communication tools, testing routines,
- records of performance,
- contact with teachers.

Its design and functionality impacts on the pedagogic methodologies available to teachers.

A VLE will also interface with insititution systems providing information on student registration, performance and finance.

Virtual Learning Environment systems are available from commercial vendors and from Open Source consortia. The era in which institutions might consider the development of their own VLE is over but many institutions still face the challenge of transfer from one or more home grown systems or commercial systems operated at departmental level to a single system operated and maintained at institutional level. Acquisition of a VLE is a major institutional decision, there are a number of published methodologies that provide a framework for decision making (Ref XXXX). Valuable information for assessors may be available in the documentation developed during the selection process.

Virtual Learning Environments are multi user systems, management of the access privileges to the functional sections of the system may pose challenges. The architecture of a VLE may be tailored around teaching patterns prevalent in campus

based institutions with course management structures that are teacher focussed, with the teacher having responsibility for defining course materials, managing the presentation and undertaking the assessment of the course.
Institutions operating a distance learning or e-learning programmes may delegate some teaching responsbilities to tutors who support learners on large population courses. The VLE should be configured to support this model of operation and allocate to tutors appropriate access to student records, assessment systems and communications tools.
The VLE should be configured to provide effective services through the specified access routes, any limitations associated with web access via modem or DSL connections should be clear to those responsible for course development and presentation (via internal documentation of systems capabilities), those with learner support responsibilities (via their training and briefing materials) and students (via course and programme information and help desk services) .
All users should be confident that the VLE provides sufficient security of personal details and all communications between student and institution.
The course interface should provide students with information through a consistent and logical screen layout and students should be offered the option of a "guided tour" to all functions at the start of each course. On screen "buttons" should have accessible help facilities at all times to provide learners with prompts and reminders on the use of functions and services.
The VLE should offer students a standard set of study tools that allow students to personalise their courses with annotations and notes to parallel the note taking expected of them in conventional course. The system should indicate to students those sections previously accessed etc.

The VLE should provide for compatibility with emerging international standards that define metadata of learning materials to provide teachers with the opportunity to use e-learning materials from as wide a range of sources as possible.

E Learning Materials

The design and development aspects of e-learning materials is covered in the Course Design section of this document. This section covers aspects relating to the delivery of materials via the VLE/LMS system.

There are two aspects to review of e-learning materials:
1 The user perspective:
Reviewers should endeavour to review materials from a student perspective preferably using a student user identity.
2 Back office perspective:
Reviewers should confirm that the technical aspects of the materials comply with institutitional policies on meta data and other factors relating to rights, design and reusability.

The previous section covers the generic aspects of the services offered through the VLE and the nature of the interface, these notes relate to course-specific materials.

It is recommended that reviewers undertake both a broad review of the course materials and conduct in depth reviews of selected sections.

Key points are:
1 Is there a clear guide to the course and the functions of the course materials provided?

2 Is there a single study route presented or are options available that may be tailored to students' preferred learning style or work patterns?
3 Are the access routes to information sources clear and are any restrictions on access (time, equipment, location, additional registration *etc*) indicated?

Information Requirements

There should be a clear institutional strategy for the provision of information to students via the virtual learning environment.

The main issues for students are that information is accurate,up-to-date and accessible, and for the institution the issues will relate to ownership of the information and the authorities to post information in the various sections of the virtual learning environment.

It is likely that there will be various areas within the VLE that are the responsibility of different administrative, operational and academic divisions of the institution, and a student must be able to navigate between these easily.

For students their main focus will be the home site for the course on which they are currently registered, and log-in procedures may be designed to ensure that they can access this site via a minimal number of mouse clicks. The pages that they pass through en-route to their home page may be used to provide gateways to other important information sources and highlight any recent changes in non course-specific matters, *eg* changes in registration procedures, possible downtime on the system *etc.*

Assessors should sample routes to information sources using a student log-on ID to test systems for effectiveness and user friendliness.

Updating and Revision

The management of the e-learning system should be the responsibility of dedicated professional staff who operate to clearly defined standards.
Security and confidentiality of personal information should be conducted in accordance with national regulation and if the institution registers students and/or employs staff in other countries it should satisfy itself that the system complies with regulations at the point of delivery.

The system will allow for data collection on many aspects of its operation and the use that users make of the system. Monitoring the patterns of use by students and staff directly supporting their study is a source of information for improvement in pedagogical as well as technical aspects. Evidence of collaboration between the systems managers and academic staff in acquisition and analysis may indicate the the institution has well established improvement and revision processes.
VLEs in common with other software systems, are subject to ongoing development. Institutions should evaluate carefully the features offered by upgrade options and the benefits of enhanced performance weighed against the direct and indirect costs of implementation.
Incremental modification of locally developed systems may pose challenges for those charged with management of the system. Tension between academic staff, enthusiastic for change in their teaching materials, and managers operating a formal management process may be evident.
As students may have purchased equipment specifically to undertake their studies they have an expectation that updates to the institution's systems will not render their

equipment inadequate or redundant. Course information should indicate the period over which a particular technical platform is expected to meet the institution's requirements.

On-line assessment

The effectiveness of the on-line assessment system is a key contributor to student learning. The design and management of the delivery system should support the achievement of pedagogic objectives and course assessment strategies.

Standardised management and operating procedures will provide evidence of data protection and security of student related information.

From a student perspective ease of use of the system and prompt and timely delivery of results and feedback are likely to be the key performance indicators.

Obviously, students will be able to track their individual performance in course assessments but it is also possible for them to be provided with information on their performance in comparison with fellow students or previous cohorts following the course. Presentation of information on comparative performance should be carefully considered and its statistical basis made clear.

Assessments that are taken and assessed electronically should provide feedback at an appropriate time.
If the assessment is purely formative then feedback should be provided immediately on completion.
If it is summative then feedback should be provided as soon as possible. If the assessment is student-specific and generated by selection from a question bank, then immediate feedback may be permissible. If security is an issue, then feedback should be provided after the closing date for submission. Individual feedback may be augmented with feedback derived from overall performance of the student population.

In contexts in which the on-line system is used as a mechanism to transfer an assignment for human marking, it is important that reviewers distinguish between the technical features and the human factor aspects. The system should indicate to students the status of their assessment *eg*, submitted, pending marking, marked, available for return *etc.*
The quality of feedback and consistency of marking fall within the human domain and quality assurance protocols similar to those applied to text-based distance learning systems should be in operation.

An institution that has committed itself to an extensive e-learning programme should demonstrate that it is investing resources in the development of on-line assessment systems

Course teams should be supported in the development of assessments that challenge the presumption that on-line assessement techniques are dominated by simple multiple choice tests. Assessors may wish to explore with course developers the constraints placed upon them by the assessment tools available via the virtual learning environment.

Distribution of physical materials

It is envisaged that the majority of e-learning courses will be delivered entirely on-line but institutions should be able to demonstrate that they have the capability to undertake the distribution of physical materials in certain circumstances.

It is possible to envisage three layers of operation:

1 All students supplied with physical materials
2 Student option for physical materials dependent on technical circumstances
3 Contingency planning for emergency provision

If a course is primarily text-based and its course materials are typically a collection of pdf files then a cost benefit analysis may indicate that distribution of the course as physical text materials is an option that may be preferable to students. (Surveys of students may indicate that the majority print out materials and analysis demonstrates that the costs to them are greater than the costs of central printing and distribution). An institution may have the capability to undertake this in-house or may establish a distribution network in association with a commercial organisation.

If students are studying in districts in which high bandwidth connectivity is not available or performs erratically the distribution of video material via disk is an option that institutions may choose to provide.

Institutional contingency planning should provide for the distribution of physical materials to students experiencing an emergency situation at a critical point in their studies or unforeseen circumstances relating to the institution's networks and e-delivery systems.

5 Staff Support

E-Learning institutions should provide their staff with the necessary facilities and support for delivering a high level of academic teaching. The fact that this is done using digital devices brings with it an extra responsibility for the institution. In this category the most important criteria are brought together and address the needs of both full time and associate staff who may be employed in a number of teaching and administrative roles. The objective of all support services is to enable all members of academic and administrative staff to contribute fully to e-learning development and service delivery without demanding that they become ICT or media specialists in their own right.

Benchmarks

1 All staff with academic, media development and administrative roles need to be able to support the development and delivery of e-learning programmes without themselves being technical experts. The institution should ensure that appropriate training and support is provided for these staff and that this is training is enhanced in the light of system developments.

2 Pedagogic research and development should be regarded as high status activities within institutions with a commitment to high quality e-learning. There should be mechanisms within these institutions (and where relevant across institutional consortia) for the dissemination of good practice in support of e-learning, and for the training or mentoring of new staff in such practice. Career development incentives need to reflect an e-learning culture.

3 The institution should ensure that issues of staff workload and other implications of staffs' participation in e-learning programmes (such as intellectual property rights over programme materials) are taken account of in the management of courses or programmes, and any compensation measures operated fairly and equitably.

4 Institutions should ensure that adequate administrative support (in the form of effective management information systems as much as human resources) is available to academic staff, particularly part-time tutors/mentors.

5.1 Technical

Staff working in an e-learning environment require significant technical support in the acquisition, operation and maintenance of ICT networks. Specialist technical staff should support academic and administrative staff in all technical aspects in order that they can maximise use of their expertise in an e-learning context.

5.1.1 Technical support (ICT)

All staff should have access to technical support in the use of the e-learning environment and the hardware and software used in teaching.

For those working remote from the institution's physical base this technical support will be provided on-line and whilst the institution may not have responsibility for the physical equipment used by those employed in support roles it should endeavour to provide a comprehensive advisory service on all technical aspects that might impinge on the effectiveness of the institution's teaching.

Within the institution technical support should be available to all staff and operate to clear performance levels that acknowledge the impact that technical problems might have on student learning.

Indicators

At threshold level:

Academic staff and departments have access to technical support services in selection, acquisition and maintenance of their ICT equipment and networks

Technical services operate to clear and agreed standards for provision of staff support.

Media development and Administrative staff have access to technical support services in selection, acquisition and maintenance of their ICT equipment and networks

The infrastructure supports teachers at all times with online access to materials, administrative data and communication facilities.

At excellence level:

There is an institutional plan for the provision and future direction of the technical support function.

Technical departments inform academic, media development and administrative staff of the potential of emerging technologies and systems.

Technical departments collaborate with academic, media development and adminisrative staff in the development of strategies and plans for future use of ICT.

A suite of on-line technical support services is available to staff working remote from the institution's physical base.

5.1.2 Training support

Academic and administrative staff have access to a comprehensive suite of training opportunities that equip them with the capabilities to operate the software and hardware neccessary for them to contribute effectively in an e-learning environment.

Training may be provided by induction programmes on appointment, training programmes associated with the introduction of new systems, updating programmes, on-line training materials and helpdesk services.

The needs of staff working remote from the institution's headquarters or campus should also be provided for via on-line network and telephone support services.

Indicators

At threshold level:

Responsibility for the provision of training is clearly defined and adequate resources are allocated.

Newly appointed staff are provided with induction in the use of software and systems

The introduction of new systems or equipment is supported by adequate training for all users

At excellence level:

There is an institutional plan for the provison of training in the technical aspects of e-learning

The intranet provides access to self help training materials augmented by help line services

5.2 Pedagogic

The provision of support for staff in the pedagogy of e-learning is essential if e-learning is to be implemented as an integral component of institutional activity. The majority of academic staff will not have experienced e-learning during their own education and may not have received training in the pedagogic possibilities of e-learning. The development of early generations of e-learning programmes have been driven by enthusiasts but future institutional development should be based on involvment by the majority of academic staff. Institutions must foster an environment that encourages and supports the development of pedagogic skills and expertise amongst its staff. Recognition of these in its structures of reward and esteem is an important factor.

5.2.1 Pedagogic support

Staff need to be supported in the development of the pedagogical, technical skills and methods that accompany and are necessary for e-learning.

Dispersed expertise within an institution may be focused by the formationof a real or "virtual" department within the institution and their expertise made available to others involved in e-learning delivery via, for example, internal consultancy, secondment to development teams, training courses, and seminars (real and virtual).

Indicators

At threshold level:

The institution offers to its staff an information service on uses of e- learning via library and intranet

Training courses are available for staff engaged in e-learning activities

Staff are encouraged to provide mutual support in cross-professional groups in the development of e-learning materials

Staff are supported in the pedagogic uses of digital technologies (including web oriented tools) in teaching.

Staff employed as tutors and in other student support roles are appropriately briefed and supported in the pedagogic techniques incorporated in courses.

At excellence level:

The institution has recognised structures for the dissemination of best practice in relevant pedagogic techniques

There is an insititutional plan for the development of pedagogic support services

The institution has a "showcase" site on its intranet demonstrating best practice in on-line pedagogy

5.2.2 Pedagogic development

Pedagogic development is seen as a key activity for academic and student support staff within the institution and staff enjoy an environment in which their efforts in this area are respected and acknowledged

Indicators

At threshold level:

Tutorial and other support staff are encouraged to take part in pedagogic developments. Professional development seminars and symposia on pedagogic issues are organised (and well attended).

Internal and external publication on pedagogic issues related to e-learning is encouraged

Internal secondments and cross-departmental working are used as mechanisms for sharing expertise in pedagogic techniques.

The experience of tutorial and other support staff is valued by the institution

Student feedback is used extensively in review of pedagogic developments.

At excellence level:

Pedagogic development is widely respected throughout the institution and recognised through reward and career development structures

The Institution has a group of staff who are committed to the research and development of e-learning pedagogy. These staff may operate as a self contained unit or, perhaps more appropriately, as a distributed unit contributing to the activities of a "host department"

The institution encourages and supports participation in inter-institutional collaboration and exchange programmes related to pedagogic development

5.3 Resources

Those involved in the development and delivery of e-learning courses and programmes should have access to the resources to enable them to undertake their activities effectively. The aspects identified in this section include information resources, administration and support in their career development

5.3.1 Information and Media support

Staff should have the access to support in the acquisition of information and media materials necessary for them to fulfil their role in the development and delivery of e-learning programmes.

Information on the performance of current and previous e-learning programmes is an important aspect of achieving improvement in programme design and delivery, hence staff should have access to institutional data and other information relevant to their sphere of activity.

The indexing and archiving of e-learning materials demands different approaches to those required for traditional materials, and institutions risk losing hard-won experience if they are unable to easily identify and access exemplars of materials or software components.

On-line resources should also be available to tutors for incorporation into their responses to students, or for posting on student community sites they may manage or moderate.

Indicators

At threshold level:

The technical infrastructure supports teachers by providing online access to materials, administrative data and communication facilities.

The library function within the institution is adapted to the provision and maintenance of on-line resources for staff and students

Support is available for course design staff in the research and evaluation of online resources for student use

The institution complies with appropriate emerging metadata standards for indexing e-learning materials

Tutors make active use of on-line resources in their feedback to students and other aspects of their on-line teaching

At excellence level:

The institution has staff committed to the maintenance of historical records of course and student performance and their analysis to assist in programme development and delivery.

The institution has processes for indexing and archiving its e-learning materials for evaluation and potential re use

Development teams are routinely able to access previously developed materials and consider their potential for re-use

There is evidence of re-use and re-purposing of e-learning materials in preference to *ab initio* development

5.3.2 Administrative Support

Effective administative support should be provided to all staff involved in the development and delivery of e-learning courses and programmes.

Primary design of the administrative services should aim to facilitate on-line interaction with students. There is a parallel requirement that interactions requiring staff input are processed with speed and efficiency appropriate to a customer service organisation operating primarily via on-line interaction, *eg* full student information available to all staff handling phone or postal enquiries.

The introduction of e-learning may create new requirements for administrative tasks over and above those encountered in previous modes of delivery (*eg* the administration and management of teaching activies devolved to tutors/mentors). The impact on staff should be assessed and appropriate arrangements made for additional staff or adjustment of workloads.

Study centres should also provide their tutors and teachers with support for effective teaching (*eg.* supply electronic teaching facilities independently of the central office). This includes administrative support, both at study centre as well as (on-line) via the central office.

Indicators

At threshold level:

The institution has assessed the administrative impact of e- learning and e- learning systems on the workloads of all staff groups

The institution has adjusted staffing levels and workloads to account for the requirements imposed by e- learning

Administrative support at study centres facilitates effectively the teaching function, meetings with students and other stakeholders

At excellence level:

All staff using the administrative system report that it operates well

5.3.3 Career development

The involvement of staff in e-learning development needs to be properly recognised by their institution for promotion and career development opportunities.

At threshold level:

Staff acknowledge that their inputs to e-learning programmes are recognised in career progression structures

At excellence level:

The institution has reviewed its careers progression structures to take account of new roles and functions associated with e-learning

Criteria for progression and promotion from existing roles are reviewed to ensure that e-learning contributions are appropriately reflected

Assessors notes for staff support

This section addresses issues associated with the support that is made available to the institution's staff in pursuit of institutional objectives for the development and delivery of e-learning. It is assumed that e-learning is in transition from being a pioneering activity driven by enthusiasts to a mainstream activity that is driven by top down institutional policies and objectives. In managing this transition institutional leaders must pay attention to the support needs of their staff and ensure that staff efforts in this field must be acknowledged by adequate reward and recognition.

Technical

Technical Support

The main objective of the technical support and training services is to ensure that all staff in academic, media development and administrative departments are able to fully support the development and delivery of e-learning developments without it being necessary for them to be technical experts in their own right. In this context Technical Support is interpreted broadly as covering strategy, planning, acquisition, and maintenance of ICT equipment and systems for e-learning. Allocation of departmental responsibilities will vary from institution to institution but the objective must be effective support to the delivery of e-learning.

Early generations of e-learning development may typically been driven by academics and others with a particular enthusiasm for the use of ICT or software development. If an institution is to integrate e-learning into the mainstream of its programmes, all academic and other professional staff must be confident that they can exercise their professional skills in the knowledge that they will be adequately supported in the use of the software and technical systems that they are required to use.

The use of desktop applications packages is routine in most areas of employment and it is reasonable to expect that those interfacing with e-learning systems will receive support that enables them to regard the e-learning system as another routine computer desktop tool.

Organisation of technical services may be managed at institutional or departmental level but there are advantages to working to common standards across the institution. The introduction of an e-learning system may produce tensions between existing departments involved in the provision of ICT support. Typically provision of academic and administrative support may be the responsibility of separate divisions operating to differing standards. Introduction of an e-learning system demands that administrative and academic staff operate on the same system. In academic departments it may be appropriate for technical support for e-learning purposes to be provided separately from support for research activities in order to remove any conflict over priorities between the two.

All staff involved in the provision of technical support should have a clear view of the importance of their role in the development and delivery of e-learning.

Support services should be available to staff at all sites and locations, including study centres. In some instances delivery of services may be dependent on external agencies but these should be monitored to ensure that they are fit for purpose.

Arrangements for the support of staff working on a part time basis in tutorial and student support roles may differ from those who are institutionally based but given the front-line nature of their role they require provision tailored to their requirements.

Collaboration between technical, academic and administrative departments in "foresight" activities conducting realistic appraisal of the potential of new technologies and systems may contribute effective longterm planning and reduce the prospects of pursuing initiatives that may prove to be dead ends.

Training Support

Provision of high quality training support is essential for staff who are required to interface with the e-learning system and its supporting equipment.
Many institutions will have established training programmes that ensure that staff are adequately trained in the routine use of ICT equipment and desktop software. However, the introduction of an e-learning system should be seen as a major change programme for the institution and supported by an associated training programme.

Design of training programmes should be informed by a training needs analysis that identifies training requirements by job function and address the needs of both existing and newly recruited staff.

Departmental managers may be specifically briefed on training and staff development implications and provided with support to implement training programmes as departmental level.

Training may be provided using both traditional face-to-face methods and using on-line training materials and simulations. Adaptation of generic training courses/materials provided by systems suppliers to cater for the specifics of the implementation at the institution may provide indications of institutional commitment to provision of effective training.

It is to be expected that any well developed system will contain some elements of embedded training via the Help functions within the system. Additional training materials including simulations of common interactions may be available on-line *eg* a firewalled training section of the e-learning system may permit staff to practise data entry or interactions with dummy students.
Help Desk staff may be empowered to direct staff to sources of training or to recommend courses.

Additional training programmes and opportunities should be provided whenever system changes or extensions are introduced.

In institutions that have operate a mature e-learning system induction programmes for newly recruited staff and on-line refresher provision will characterise a well developed support system.

Provision of training to staff working remotely from the institution and in part time roles in tutorial and other aspects of learner support must also be managed effectively. Training for this group of staff must acknowledged that they require insights into the e-learning system from a learner perspective as students may sometimes direct systems enquiries to them.

Pedagogic

Pedagogic support

Academic staff and media professionals working with them must become adept at working within a new pedagogical paradigm in the development and delivery of e-learning materials.
Early entrants to the field have learned by doing but there is a growing body of knowledge relating to the performance of pedagogic techniques employed in e-learning.
An institution may chose to implement a formal programme of training to equip staff with a basic introduction to e-learning techniques that is mandatory before staff assume significant responsibilities for e-learning, but in a higher education environment a more collegial approach is likely to be adopted, particularly with respect to academic staff.
"Lighter touch" approaches might involve a rolling programme of seminars, websites providing examples of pedagogic techniques, developmental workshops for course development teams *etc.*
The institution's media professionals may be key transfer agents in ensuring that pedagogic techniques deployed successfully are disseminated to teams operating in other academic areas.
Assessors will have to explore sensitive areas that will indicate the linkage between institutional rhetoric regarding e-learning and the reality experienced by course developers.

Pedagogic Development

Pedagogic development is one of the most important contributors to the successful implementation of e-learning in higher education. Early generation e-learning activities were primarily driven by enthusiasts in the academic community, if it is to become a mainstream institutional activity then the majority of academic staff must become willing and effective users of the pedagogic techniques offered to them.

The majority of academic staff will not have experienced e-learning during their own education and those that have undertaken formal training in pedagogic methods may also be novices in their application in an e-learning context. Hence those in leadership roles must ensure that the adoption of e-learning secures buy-in from academic staff and is not regarded as a top down imposition.

Pedagogic research and development should be regarded as high status activities within the institution and internal structures for reward and esteem may be used to emphasise institutional commitment to the activity.

In an institution that has a strong departmental structure based on academic disciplines there is a risk that development will be compartmentalised risking the establishment of local pedagogic cultures and multiple reinvention of techniques. Specialist pedagogic researchers may be based in a self contained unit charged with dissemination of its findings via publication on institutional networks and forums. However an alternative is to embed specialists in departments across the institution through the creation of a virtual network involving the specialists and departmentally based associates.

For those institutions that operate in consortium arrangements with other institutions it is important that the experience is routed back into the institution in order that consortial activity is not regarded solely as an add-on to mainstream activity.

The course design and development process is commonly conducted as a team activity and it is important in a higher education context that academic staff are intimately involved in determination and implementation of the course's pedagogic structure. The practice of imposing an instructional design schema on a course curriculum outline is unlikely to secure academic support and commitment.

Auditors should endeavour to determine if institutional policies are gaining acceptance amongst course team and should seek examples of improvement of the application of pedagogic development activity in a sequence of courses developed over, say, a three year period.

Resources

Information and Media Support

It is presupposed that the institution operates effective library and information services to support academic purposes for staff and students but there is a need for information services relevant to the processes of e-learning.

Staff involved in the development and delivery of e-learning must have access to information on institutional experience. The institution may have policies relating to the retention of data on overall student performance but this may not be sufficiently fine-grained to yield information on particular components of a course. Hence staff should expect that policy development and resources are allocated to ensure that data capture and performance analysis of individual e-learning components is feasible.

The indexing and identification of e-learning materials is essential to institutional learning. Reinvention of materials, teaching episodes and software tools is commonplace in many institutions as it is difficult/impossible to identify if appropriate source materials have been developed elsewhere.
The SCORM and IMS systems aim to provide a metadata framework for the indexing and identification of learning objects. Institutions should be able to demonstrate that they are implementing these or similar systems and most importantly have mechanisms in place to provide their staff with access to indexed and searchable libraries of its own materials and subsequently materials from other sources.

Administrative Support

The focus of design of e-learning systems may be directed towards providing an effective interface for conducting aspects of business with students. The design of internal interfaces for staff is also important as staff interactions with the system will impact on staff workloads and influence their attitudes towards the development and delivery of e-learning programmes.

The introduction of a new system may change well established patterns of working and formalise interactions between groups of staff that previously operated on an accepted custom and practice basis. The formalised procedures may be regarded

as an increase in workload and have a negative impact on attitudes towards the system.

Significant changes in operations *eg* the introduction of devolved teaching involving tutors/mentors, may create a tier of activity that is new to specific departments. The institution should model the workload implications of new models of operation and develop appropriate staffing plans.

The e-learning cycle of activity may differ from that for conventional courses and the use of a centralised adminstrative system may allow for extensive collection of data. Reporting schedules should be designed to match the natural pattern of teaching of e-learning programmes and require the production of reports that are recognised by staff as adding value to the development and delivery of programmes.

Tutors/mentors working on a part-time basis should be provided with adequate administrative support. High adminstrative loads will detract from the commitment of this group of staff. Predominantly support will be through effective design and operation of systems rather than through provision of direct staff support.

If the institution operates a network of study centres the administration associated with scheduling and the physical resources of the centre should be valued by students and staff associated with the centre.

Career Development

Staff motivation is important to the effective development of e-learning programmes. The very nature of the development and delivery processes means that direct contact and interaction with students is less than would be the case in face to face teaching institutions, reducing the positive human feedback that may be a powerful motivator for many.

Introduction of e-learning may require differing working patterns and produce different outputs to those that have been used as markers for existing career progression patterns. Hence institutions should pay considerable attention to the impact of new methods on its career review and progression procedures. An institutional initiative to change teaching methods will not be well supported if staff are not appropriately awarded for adopting new practices.

6 Student support

Student support services are an essential component of e-learning provision. Their design should cover the pedagogic, resource and technical aspects that impact on the on-line learner. It is presupposed that on-line activity will form the core of the e-learner's experience hence support services should be designed to be accessed in the first instance via the student's homepage or other entry route to the institution's on-line learning system.

As students are likely to be working to flexible schedules, support services should operate, wherever possible, in a way that acknowledges this.

Technical support areas may be required to offer services on a 24x7 basis. In other domains 24x7 may be the target for automated services with human contact/follow up operating to stated performance targets.

Students should have a service map and clear specifications of the services available at all levels.

Benchmarks

1 Prospective students should be provided with a clear picture of what is involved in pursuing the e-learning programme and the expectations that will be placed on them. This should include information on technical (system and VLE) requirements, requirements concerning learners' backgrounds and skills, the nature of the programme and the variety of learning methods to be used, the nature and extent of support provided, assessment requirements, fees, *etc.*

2 E-learning students should be provided with a full description of their course or programme (equivalent of a student handbook) setting out the requirements at each stage. This should include information on the ways in which they will be assessed, the relative weightings of different forms of assessment and the role of formative assessment in their programme.

3 E-learning students should have access to learning resources and learner support systems which, although they may be provided through different means, are the equivalent of those available to campus-based students. These should include:

- access to library resources
- support for the development of key skills (including support for e-learning skills, collaborative working on-line and contributing to on-line communities which are key skills in an e-learning context)
- an identified academic contact or tutor who will provide constructive feedback on academic performance and progression
- access to help desk, administrative support and advisory services
- opportunities to provide and receive formal feedback on their experience on the course
- procedures to handle and resolve any difficulties or disputes which may arise.

4 Students should be provided with clear and up-to-date information on the

	range of support services available and how these may be accessed.
5	The expectations on students for their participation in the on-line community of learners needs to be made clear both in general terms and in relation to specific parts of their course or programme.

6.1 Technical

Effective operation of the institution's on-line learning environment is the key component of technical support that impacts on students. Continous availability should be the target.

Students should be provided with access to assistance via a technical help-desk service that is capable of addressing technical aspects of use of the system and of course-specific software.

6.1.1 Online availability

As e-learning students are likely to adopt flexible study patterns the technical infrastructure should operate to a 24x7 schedule. This has impact on the technical aspects of operation, (maintenance, upgrading, *etc*) and on the provision of help desk and other advisory services.

Indicators

At excellence level:

The online service is available and fully functioning 24 hours per day, seven days per week over the planned learning period

Maintenance and up-dating work temporarily preventing use of the online service should be performed at the time of lowest student demand and all users clearly notified in advance.

6.1.2 Technical Support and Helpdesk

Support services should cover both the technical aspects of the system and, wherever possible, problems that students might encounter with the use of course specific software. Students should be aware of the nature of services available and the means of accessing them.

Indicators

At threshold level:

Users are clearly informed what kind and level of home equipment is required, what technical support service is available, and when and from whom it can be obtained.

6.2 Pedagogic

The learning styles demanded by e-learning may require students to acquire new learning skills. Students should be supported in the development and application of these skills through a range of mechanisms and services.

There are benefits associated with an institution-wide approach to pedagogic support. For example, as new software and communication systems become available experience in their use can be disseminated broadly across the institution.

Students should be informed about the services available to them to adapt or acquire new learning skills, and how to access them.

6.2.1 Analysis of support needs for different user groups

The institution should monitor the needs of their students in order to inform their planning of support services for e-learners. Different student groups may display differing experience of relevant technologies and learning methods.

Rapid developments in ICT and software lead to rapid changes in prior experience that may have significant impact on student needs in a period as short as one or two years.

Indicators

At threshold level:

It has been checked that the requirements for entering a course or programme match with the prior skills and knowledge of the learners, or that the acquisition of these forms part of the preparatory course material.

The support needs for the main learner groups have been analysed and addressed.

6.2.2 Pedagogic guidance

Students should be aware of the range of pedagogical support services available to them and the routes through which they can gain access to these.

Support may be provided through on-line resources, contact with tutors or mentors who have a specific responsibility to support a particular group of students, or through contact with advisory services that may be generic or course specific.

Indicators

At threshold level:

Students are informed through course information of the pedagogical skills they will be expected to use during their study.

Preparatory materials for the acquisition of required learning skills are available to students in advance.

At excellence level:

The provision of relevant pedagogical advice and guidance is an integral part of the course or programme planning process

Students have access to learning skills advisors and other resources to augment or reinforce their learning skills.

6.3 Resources

Many aspects of student support are provided via access to resource materials and services. The library service is one aspect of resource provision that is widely available to campus based students: extension of the service to on-line students is essential for effective delivery of many HE programmes.

Resource provision is usually managed at an institutional level in order to deliver economies of scale and ensure a consistency of provision and dissemination of best practice. For example:

1 Resources and systems to facilitate the development of online learner communities;

2 Resources to develop e-learning skills. These may be provided and maintained by the library or another specialist unit

3 Maintenance of a network of study centres as means of regional or national outreach. The use of such centres should be designed to support e-learners but there should be recognition that their use may place restrictions in time and place that may detract from the effectiveness of study for some groups of students.

6.3.1 Library and information sources

Institutions providing e-learning courses have a duty to ensure that all students are able to access the information sources necessary for successful completion of the course. While in an e-learning context much of this can be built in to the formal course materials, students may require to access additional sources to provide complementary or contrasting materials. The provision of access (on-line or otherwise) to library resources for its e-learning students, and any required training in their use is an institutional responsibility, and institutions should strive to ensure an equivalence of service for on- line as for campus-based students.

Indicators

At threshold level:

Sufficient library resources are available to all e-learning students either on-line, through an effective system for distribution of materials, or other means.

Resources are available for delivering training to students in information literacy and the use of on-line materials.

Library resources are accessible out of normal office hours.

At excellence level:

The institution is able to provide an equivalence of library service for its e-learning as for its campus-based students

6.3.2 Learner communities

Creation of on-line communities of students is important as it reduces the isolation that may be experienced by many on-line learners. Institutions must identify those "community centred" activities that are essential to the achievement of course objectives and those activities that are essentially social in nature.

An important function is the provision of mechanisms for students to give formal feedback on their experience of the course or programme, and to receive responses to such feedback from staff.

Devolution of responsibility for the set up and monitoring of on-line communities is desirable but carries with it risks that require sensitive management.

Indicators

At threshold level:

The institution is committed to the establishment and proper functioning of communities of e-learning students.

At excellence level:

This functioning supports:

1 learning interaction between individuals and groups

2 social interaction between students

3 feedback on students' experiences of their programme

This makes use of synchronous (face-to-face, telephone or video conference, whiteboard, *etc*) and asynchronous (discussion forum, e- mail, *etc*) interactions as required.

6.3.3 Developing e-Learning skills

Support in the development of e-learning skills may be an important contributor to student success. Potential students should have the opportunity to learn what will be expected of them and the services available to assist them in developing the necessary skills. Responsibility for this aspect may be managed at institutional level by a library or information services division.

Indicators

At threshold level:

Students are informed of the expectations on them in respect of e- learning skills prior to the start of their programme. Examples of study materials are available at this stage.

At excellence level:

Opportunities are available for students to self-test their e-learning skills prior to the start and to undertake a preparatory course to refine these skills as necessary.

6.3.4 Role of study centres

The primary target for e-learning should be to allow students to interact with course materials, library materials, tutors/mentors and fellow students via their home PC.

However, requirements for use of specialist equipment or learning materials, the nature of certain types of tutorial or seminar-type interactions, and the requirement for security of assessment practice may demand the attendance of students at a study centre.

The institution may operate a network of study centres at which the functions listed above can take place and students may access a variety of services. The role of existing study centres or outreach centres may require adaptation to meet the needs of e-learning students depending on the mode of delivery and anticipated student personal access to equipment and connectivity.

Indicators

At threshold level:

The role of study centres in supporting e-learning provision, the resources and support services offered at study centres, and the management of study centre facilities is addressed as part of the design of the programme.

Students are clear about the locations of study centres, the facilities and support which they offer, and the occasions during their programme at which they will have to attend a study centre.

6.4 Staff Resources

E-learning students may be provided with access to human support delivered on-line, via telephone or face to face dependent on the approach adopted by the institution.

The support may be course specific and/or generic in nature.

The requirements for particular types of human interaction and intervention should be part of the institution's planning process and incorporated within pedagogical and course design.

Insititutional policies should define the service standards to which staff will provide the human interventions for student support.

Staff providing student support will have defined job descriptions and access to information sources that allow them to carry out their functions effectively.

6.4.1 Resource planning.

E-learning students should be provided with access to human support delivered on-line, via telephone or, on occasion, face to face, depending on the approach adopted by the institution. The expected level and frequency of student-tutor interaction during a course or programme should be made clear to students and staff.

Planning at institutional, programme and course level should take account of the need for satisfactory provision of support services whether through course specific tutors and mentors or through more general services such as counselling, career guidance *etc.*

Estimates of the demand for services should be developed and underpin planning activities and these should be revised in line with experience gained through operation of services.

Indicators

At threshold level:

The institution's planning process includes a clear and informed analysis of the human support functions needed for successful operation of the e-learning programme.

This covers requirements for mentoring, tutoring, coaching, counselling, assessment, management, advice and guidance, and covers academic, professional and other specialist staff inputs.

There are mechanisms in place for the training and development of staff undertaking the above functions

At excellence level:

The institution works to staffing norms and levels of staff resource (*eg* staff-student ratios) which are informed by practice elsewhere and adjusted in the light of experience and feedback.

6.4.2 Role Definitions

The support staff resouces on which students may draw, the roles undertaken by different staff and the levels of support available should be made clear to students at the start of the course or programme.

Arrangements for the organisation and management of student groups (*eg* for small group tutorials or for larger regional or national discussion groups) need to be clear to both staff and students. Tools should be available for the organisation and management of student groups and staff should have available models of the situations in which their support will be required.

6.4.3 Administrative support

Students require access to human intervention in aspects of adminstration when difficulties arise that are not catered for adequately by on-line systems.

There should be mechanisms for appropriate levels of intervention from routine error correction in records to personal support for major difficulties.

Institutions should monitor the use made by students of access to their records and the occasions when human intervention is required.

Assessors notes for student support

This section covers the components of the support services that are provided for students. The support models will vary with institutional context. The support package will inevitably involve services from many divisions of the institution which the student will access on-line. Hence clarity of information on the services available and navigation to the sources of support is a key factor for assessors to explore using student ID.

Student support systems should be efficiently managed. Assessors should expect to include service standards and operational records indicating the student traffic to service sources.

Technical

Effective operation of the institution's on-line learning environment is the key component of technical support that impacts on students. It is to be expected that the service will be professionally managed.

Students should be provided with access to assistance via a technical help-desk service that is capable of addressing technical aspects of use of the system and of course specific software.

Online System Availability

It is to be expected that the responsibility for the management of the institution's on-line systems will be the responsibility of IT professionals who will operate the system to the standards commonly encountered in the commercial customer service sector. Comprehensive documentation of operational procedures should be evident, logbooks and other routine record keeping should demonstrate whether the standards set are being achieved.

Technical and Helpdesk support

The provision of technical and helpdesk support should also be managed by IT professionals but there is considerable scope for variation in performance. Whilst provision of 24X7 availability of the system may be a realistic goal, provision of equivalent coverage of technical and helpdesk support is more challenging. The support service is operated for the benefit of students hence its provision should broadly follow the patterns of student use as indicated by system records, thus for an institution serving the needs of part time students peaks of helpdesk traffic may occur in mid evening rather than during the standard working day.
The provision of well designed student manuals and FAQ lists will reduce the need for human inputs in the support system.
Institutions should define the scope of the services offered and not undertake to support aspects that are most appropriately provided by the suppliers of commercial software or equipment that students may be using.
The service may operate in a tiered level with staff trained to make judgements on when to escalate complex enquiries to another department. Tracking responses to enquiries routed out in this way may be a contentious issue for those involved in the helpdesk function and for enquirers.

Pedagogic Support

E-learning requires learners to deploy learning skills that they might not have encountered previously. The institution may undertake to provide support in learning skills development that acts as a preparation for, or supplement to, the learner support integrated within courses.

Responsibility for provision of these services may be held by a specialist support unit but assessors should satisfy themselves that the outputs of such a unit are well integrated with the teaching activities of core academic departments.

Learner Needs Analysis

The design and provision of learner support services should be underpinned by analysis of the demands of the course and likely prior experience of the student population.
Tracking developments in educational provision at feeder levels will assist with assessing preparedness of those following a conventional progression of study, *eg* school to undergraduate study, undergraduate to post graduate; but programmes recruiting non conventional students may require institutions to monitor the development and relevance of workplace skills to on-line study.
Information literacy, the skills for collaborative working on-line and contribution to on-line communities are key skills over and above the prerequisites for on-campus study that institutions should include in their analysis and plan to provide in their support mechanisms.

Pedagogic Guidance

Analysis of the previous experience of the potential student market and their likely needs for preparation for and support during e-learning courses and programmes provides the foundation for the development of a guidance materials and services.
Examination of the institution's recruitment materials will indicate whether students have been presented with a realistic picture of what is involved in pursuing its e-learning programmes.
Though there may be variation in learner needs from subject to subject there is likely to be a core of common skills development that is required to support learners' transition from conventional to e-learning techniques that is best provided at institutional level.

The responsibility for the development of support materials and services may be allocated on a departmental basis or to working groups that draw on inputs from a range of departmental expertise *eg* the Library may have responsibility for information literacy *etc.*

Support materials may be provided as an integral part of course development or provided for access as and when needed via an e-learning skills portal.

The person and job specifications for appointments to student support roles will provide information on the emphasis that the institution places on provision of pedagogic support to learners.

Staff development programmes for academic and other learner support staff may provide evidence of the emphasis that the institution places on supporting learner acquisition of e-learning skills.

Resources

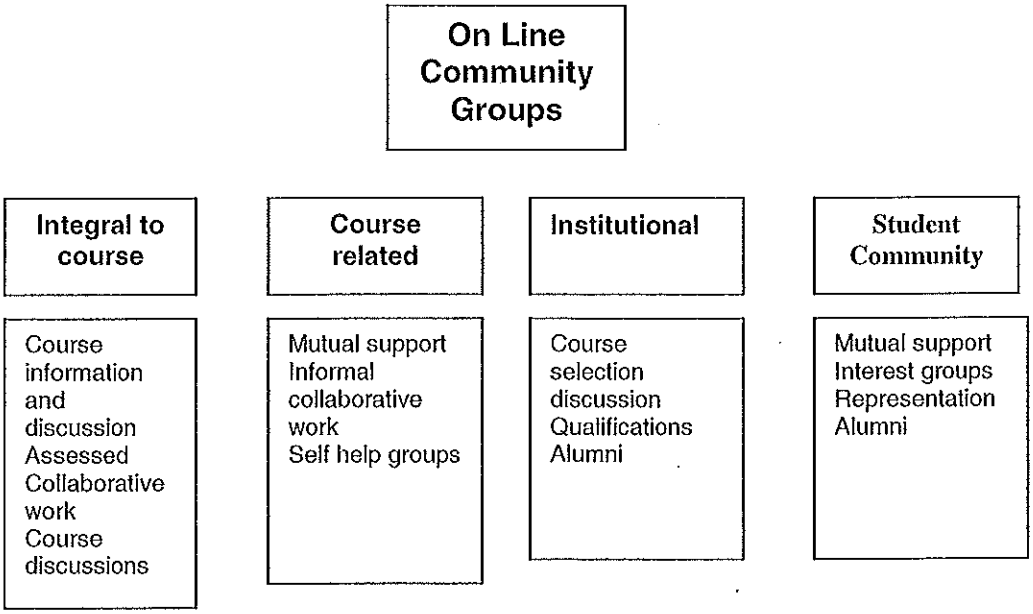
E-learners may be expected to rely heavily on the use of on-line resources and the provision of effective library and other information services. Investment in these services may enable institutions to minimise their expenditure on other support services.

Library and information sources

An institution's e-learning and on-line students should have access to the same electronic resources that are available to on campus students. Institutional policies on journal and database subscriptions may specifically identify the requirements for access by the institution's students from locations remote from the campus network. Comprehensive access by on-line students may not be attainable in the short term but it is essential that all sources relevant to the area of study of a particular course are accessible to its online students. Negotiation of access rights to the libraries of institutions working in consortium arrangements may pose difficulties if subscriptions have been initially purchased on a "students and staff of the institution only" basis. Planning for library resource provision is a component of course design requiring close collaboration between academic and library staff as on-line availability of a specific resource may have significant impact on course structure.
Course information should indicate the resources available to students, the routes through which they can be accessed and any necessary passwords should be communicated to students securely.
On-line "guided tours" may be provided as an introduction to library resources. This may be included in a range of services relating to on-line study skills that may be provided on an institution wide basis by the library. A guide to other resources that may be available to students through national and local library services, services offered by professional bodies will make an important contribution to the development of information literacy.
Reviewers may wish to assess the quality of these materials by "test driving" them using student id from a location and connection route typical for the student population.
On-line students will study at times other than conventional office hours, arrangements for help desk and other advisory services should take account of flexible working study patterns. Full 24x7 service in respect of personal advice is an unrealistic expectation but equally 9 to 5 during the working week is too restricted, reviewers should satisfy themselves that the institution is taking due account of student needs in its design of support services.

Learner Communities

Creation of a sense of academic community amongst on-line students is intended to fulfil a number of functions with academic and social dimensions.



Reduction of the isolation often associated with traditional modes of distance education is the prime driver for providing community space within an on-line learning system. Tools for online contact enable students to share learning related concerns and problems with their peers going someway to replicate the mutual support mechanisms available to campus based students.

The open and recordable nature of on-line communication frequently raises concerns over the boundary between mutual assistance and plagiarism but arguably the nature of on-line communication simply raises awareness of practices that are integral to campus life. The institution should provide guidelines on appropriate behaviour in respect of informal collaboration during study and apply an etiquette code to apply to the social aspects of on-line exchanges.

On-line discussion activity groups may be divided between those to which students are allocated for some course-specific purpose and those whose participants are voluntary members of the community.

Though informal contact and collaboration between students during a course may be desirable, participation should not be compulsory. The institution should have a code of practice compliant with relevant data protection and privacy legislation relating to the release of course participant lists, e-mail addresses *etc*. Whether by an opt-in or opt-out mechanism, students should be able to remain outside any non compulsory on-line communication environment.

Institutions should monitor and survey the effectiveness of on-line community groups to inform future policy.
Group size is a key issue. In every group there will be active participants, non active participants, lurkers, and non participants. If students are allocated to tutor groups of, say, 20 the group will coalesce as a community for the activities required of them as integral and required course activities. The group may however not be large enough to contain a core of sufficiently committed participants to form a self sustaining group for optional activities, hence an informal community may require a

larger population base, constituted on a regional or course wide basis. Examples of good practice should be disseminated across the institution.

Whereas the use of bulletion boards and threaded conferences is well established, the use of Blogs, Wikis *etc* are emergent areas. Experimental activities, whether initiated by academic staff or students is subject to risk. The student interests should be paramount so the institution should have policies regarding provision of information to students on experimental and novel techniques and protection from adverse effects of unsuccessful experimental activity on their performance on the course. Evaluation of experimental work, dissemination of results should be evident and should lead to development of policy relating to the use of Blogs (or similar).

The institution may choose to allocate responsibility to its student association for the organisation of on-line interest groups or societies. These should be subject to the same codes of behaviour as those areas directly managed by the institution. Institutions may have a code of practice relating to delegation of responsibility for the mediation of on on-line discussion and conference areas. All those exercising these responsibilities should have briefing materials and training in exercising their responsibilities, and a well managed institution will provide back-up support available for consultation on the resolution of contentious issues.
System Managers will retain the authority to intervene in any identifiable breach of codes of behaviour.

There has been considerable development of expertise in the development and management of on-line communities based on asynchronous and synchronous use of text-based conferencing. The archiving of discussion strands in asynchronous text-based conferencing provides value to non participating individuals. The growth of on-line voice and video communication shifts the balance from text-based dialogue to voice based that is more difficult to archive. There may be greater value to those actively participating, less to the broader community.

E-learning skills

E-learning continues to be a new experience for the majority of students and requires learning skills that differ from those developed in conventional study. Given the varying interpretations of what constitutes e-learning it is important that potential students are adequately equipped with the skills necessary for successful study of the course or programme.

General purpose skills in the use of applications packages may be defined and described against vocationally related qualifications such as the European Computer Driving Licence and possession of such a qualification might be a recommended/essential prerequisite for registration.

A strategy of progressive development of skills within a course or programme may be implemented but options should be available for students to assess their preparedness for study.

The institution or department may offer a set of "taster exercises" to prospective students that will provide illustration of the study techniques required. An interpretative commentary on the course extracts will provide further explanation to prospective students and may provide direction to further preparatory materials.

It has been suggested that responsibility for the provision and management of a suite of preparatory skills development materials should lie with the Library (in conjunction

with a specialist pedagogic department?). Materials should draw on expertise gained throughout the institution and be subject to regular updating as institutional feedback and research develop.

Tutors have a major role to play in the development of e-learning skills via their feedback on assessment work and direct response to student enquiry, they should have available to them support materials for use with students.

Study Centres

Institutions may regard their Study Centres as outposts of the institution that serve multiple purposes, *eg* regional recruitment and administration centre, local library, teaching centre, assessment centre, *etc.*
Attendance at study centres may place constraints of time and place on study that is counter to the objective of flexibility inherent in e-learning. Institutions should be able to demonstrate that policy regarding study centre provision has been reviewed generally or specifically in relation to the introduction of e-learning courses.

If access to equipment facilities for e-learning is an intended role for study centres then assessors should assure themselves that every effort has been made to ensure that study centre opening hours coincide with those when students are most likely to be free to study. Negotiation of access rights at other institutions or reduced rates for accessing facilities of commercial cyber centres would provide evidence of an institution's commitment to securing flexible access for its students.

It is possible that due to licensing restrictions or security concerns certain resources may be available to students only over intranet connections. In these circumstances students may be required to make use of both their own home/work based facilities and those of the study centre network.

Specialised equipment or software may be available at the centre, booking systems should be in place to ensure that students are able to gain access to these facilities at a time that suits them.

Study centres may have a role as locations for tutorials and discussion groups using video conferencing facilities. Reviewers should satisfy themselves that there is adequate support to users in the set up of equipment and in user management of the event.

It is reasonable to expect that staff employed at study centres in a student liaison role are adequately briefed on the institution's e-learning policies and courses and are confident in providing advice to potential students on the implications of e-learning. If "taster materials" are available at study centres then staff should be briefed in their function and use and be able to assist potential students in their use. An enthusiastic assessor might undertake a "mystery shopper" exercise to check performance in this area.

Clear information should be available to students regarding the facilities available throughout the study centre network, the conditions for their use and, as far as possible, information on the type of staff in attendance and their hours of attendance. Students should be free to use the technical facilities in any study centre and express a preference on allocation to a particular centre for attendance at face to face events.

Review of study centre base activity should ideally involve visits to one or more centres to review facilities and meet with staff and students.

Staff Resources

The nature of higher education and the breadth of responsibility that institutions carry for the educational and personal development of their students require significant human intervention even in programmes that are delivered predominantly through e-learning methodologies. The following interactions are representative of those that may be encountered

- student – tutor (tutor group leader)
- student – teacher (course author)
- student – professional expert
- student – study skills advisor
- student - careers advisor
- student - administrative advisor.

Student handbooks, physical or on-line, will provide information on circumstances, access routes, service specification and availability by which students can gain access to direct contact with those tasked with fulfilling advisory functions.

Services may be provided on a tiered basis, *eg* a telephone or e-mail help service designed to respond to routine matters and to conduct a triage service on more complex problems, routing students to more specialist and personalised advice by appointment. Such structures allow institutions to balance the benefits of wide availability with the need to make effective use of the time of highly specialised advisors.

It is envisaged that the most frequently encountered interaction will be "tutorial" in nature, *ie* provision of advice directly related to the content and study of the course. There is an inherent tension between the desirability of having this support provided by a single identifiable individual and the need for rapid availability of advice. Reviewers should explore institutions' solutions to this issue.

There should be clear mechanisms for the allocation of students to groups for particular purposes and to establish the necessary communications links, *eg* allocation to tutor groups is undertaken by the institution, tutors have the authority to allocate students to task groups to undertake group working activities *etc.*

Student discussion sites may provide indications of student satisfaction with the effectiveness of service provision.

Advisory services should be operated to an adequately resourced plan and scalable to meet institutional objectives for the growth of e-learning programmes. Planning should be based wherever possible on experience of student demand for services and should model differing patterns of demand at differing stages in students' careers

Resource Planning

The design and provision of learner support services should be underpinned by analysis of the demands of the course and likely prior experience of the student population.
Tracking developments in educational provision at feeder levels will assist with assessing preparedness of those following a conventional progression of study, *eg*

school to undergraduate study, undergraduate to post graduate, *etc*; but programmes recruiting non conventional students may require institutions to monitor the development and relevance of workplace skills to on-line study.
Information literacy, the skills for collaborative working on-line and contribution to on-line communities are key skills over and above the prerequisites for on campus study that institutions should include in their analysis and plan to provide in their support mechanisms.

Definition of Support Roles

The scope and function of all the student support roles should be clearly specified through job and person specifications, newly recruited staff should undertake an induction and training programme to prepare them for their roles. Training materials may be accessible on-line and hence available as a reference resource that staff can consult at any time.
For those involved in teaching specific courses the generic aspects of the role should be further elaborated with specific information relevant to the pedagogic design of the course, its contents and its relationship with other courses in the programme in order that tutors *etc* fully appreciate the students' study context.
Those in support roles should be provided with access to information necessary for them to fulfil the roles expected of them, *eg* course tutors should be able to look up some aspects of a student's personal records. Students should be aware of this possibility and may be required to grant permission for this to occur.

Administrative Support

Students require support on administrative aspects of their study, matters of course registration, credit transfer, award status *etc.*

The administrative system should be designed to be pro-active with respect to routine administrative support, and reminders on upcoming deadlines for registration, submission of assignments, *etc* should be posted routinely on a student's home page or other entry point to the VLE system. A well designed system might have a second trigger point of sending administrative messages to a default e-mail address should a student not have responded to postings via the VLE system.

From an e-learner's perspective administrative support should operate to broadly similar principles of availability as their academic support. It is to be expected that students will be able to look up on-line their data on course progress, registration on future courses, courses available to them *etc.* If this is consistently provided, their need to access human contact may be restricted to dealing with exceptions.

If for example a student consults his/her record and has a query regarding their credit status as recorded on the on-line data base, Stage 1 may be to submit an e-mail query. At Stage 2 a next day e-mail response would confirm the record to be correct or acknowledge the error and its correction. The e-mail would offer further sources of advice via e-mail or phone contact with a specific department or named advisor as Stage 3 in the enquiry process. The initial query and response would be available to whoever picks up the next stage of the enquiry. Stage 4 would result in the enquiry becoming a case handled by a specific member of staff.

The processes and progress between stages should be clearly specified and assessors may wish to follow a specific case to confirm that stages are followed through to conclusion.

www.eadtu.nl/e-xcellenceqs