

5 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. Pedagogical aspects of course delivery are included in the Course Design and Student Support sections of the manual.

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

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

19. 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.

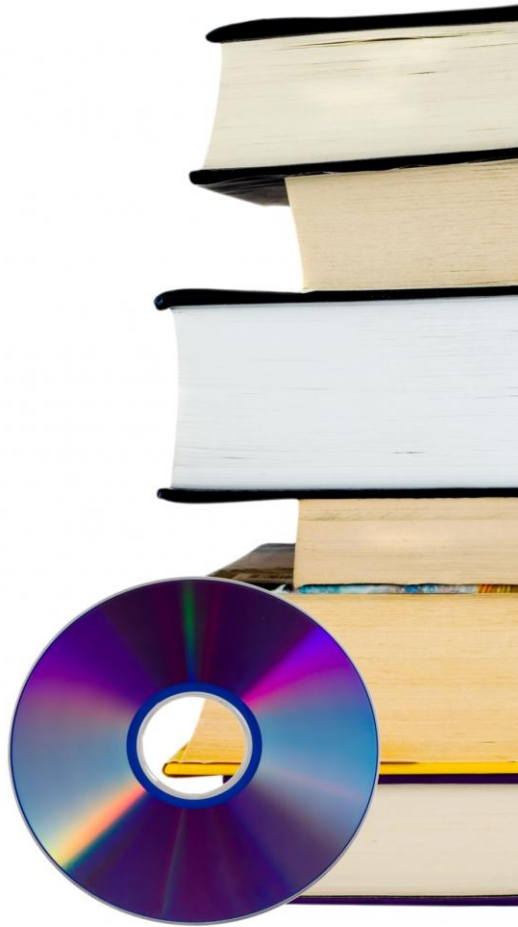
20. Appropriate provision needs to be made for **system maintenance**, monitoring and review of performance against the standards set and against improvements as these become available.

21. The VLE should be **appropriate for the pedagogical models adopted** and for the requirements of all users. It should be integrated with the institution's registration and administrative system as far as possible.

22. The information and services should be provided to all users in a **logical, consistent and reliable** way.

23. All users should be confident that the systems for communication and provision of information are **secure, reliable** and, where appropriate, **private**.

24. Institutional **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.



5.1 Technical Infrastructure

Effective delivery of e-learning requires the institution to acquire, operate and maintain a computer network capable of registering students to courses and programmes, 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 institution should have a strategic plan for technical infrastructure for e-learning, its management and development.

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 purport to offer detailed definitions of the services offered or the technical specifications.

5.1.1 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.

Institutional 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 institution should endeavour to adopt a strategy that provides flexibility to allow for increases in demand and the emergence of new technologies and patterns of use.

Indicators

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.

5.1.2 Technical Infrastructure

The technical infrastructure should be professionally designed, managed and maintained to ensure that it meets capacity and availability targets. Services and standards of performance should relate to those encountered in customer service organisations such as banks and 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 institution's infrastructure relating to research or administration.

Indicators

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.

5.2 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. *e.g.* its student registration system. Some institutions may choose to implement a VLE by an internal systems integration project. Increasingly institutions are purchasing commercial systems that may be modified to suit institutional requirements. This section describes aspects of the functions carried out by the VLE. It is not checklist for VLE functionality.

5.2.1 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 service from a commercial provider
- operating and 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

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

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.

5.2.2 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 should address the needs of users for easy access and high quality interaction with the learning materials. There is 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 institutions.

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 may make use of hybrid systems in the delivery of materials *e.g.* materials that have dynamic graphics or video content may be distributed via DVD rather than streamed. Copyrights and licence arrangements should be protected and managed effectively and any limitations on the use of third party materials effectively implemented. The organisation's approach and policy on interoperability of resources and adherence to technical standards should contribute to the effectiveness of the system.

Indicators

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, SCORM 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 institutions.

5.2.3 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

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, and 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.

5.2.4 Monitoring and updating the e-learning system

The e-learning provision should be monitored and managed on a continuous 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 the system (performance, availability, capacity utilisation, user error reports *etc*) and 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

The performance of e-learning systems is monitored and opportunities for performance improvement identified.

Performance of human 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.

5.2.5 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, *e.g.* 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

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 are 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 assessment tools and the dissemination of these across the institution.

5.2.6 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

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, *e.g.* 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 provision of CD or DVD if media streaming does not operate as anticipated.