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LTSN Generic Centre

e-Learning Series

No 3



A guide for Teachers

By Allison Littlejohn and Carol Higgison



Introduction

The Generic Centre e-learning guides are the first fully comprehensive guides on e-learning aimed at specific audiences within UK higher education. They address issues that are key to senior managers, teachers, support staff, learning technologists, heads of department and students, but the same message emerges from all: e-learning *is* learning, providing us with useful tools not only to deliver an enhanced learning and teaching experience, but also to push the boundaries of learning and teaching through creative use of technology. With e-learning now high on the agenda of the UK Government and of all educational sectors, it is clear that e-learning is here to stay. We hope that you will find these guides, written by leading practitioners in the sector, to be timely and relevant in developing your individual and institutional approaches to e-learning.

Kathy Wiles - Senior Adviser
LTSN Generic Centre

About the authors

Dr Allison Littlejohn is a senior lecturer in E-learning in the Centre for Academic Practice at the University of Strathclyde. She directs Strathclyde's Continuing Professional Development Programme in the use of Learning Technology and manages an e-learning research group. Her research currently focuses on the sharing and reuse of educational resources and supporting and developing computer assisted, task based learning. She is currently an associate of the Learning and Teaching Support Network Generic Centre, a member of the Institute for Learning and Teaching in Higher Education and is participating within a variety of publications boards and steering committees. Over the past six years she has written around 30 articles on aspects of e-learning and, in April 2003, published the first international text on Reusing Online Resources (Kogan Page).

Carol Higgison is a Senior Adviser on Academic Quality Enhancement with responsibility for E-Learning in the Teaching Quality Enhancement Group at the University of Bradford. She advises the university on strategy in relation to e learning, and has responsibility for the implementation and evaluation of the University's Virtual Learning Environment, and staff professional development in the area of e-learning and learning technologies. Previously Carol co-ordinated a national staff development programme to support the effective application of ICT in higher education; was an online tutor for Open University, MA in Open and Distance Learning; and most recently was project manager of the Online Tutoring Skills project (OTiS), in partnership with the Robert Gordon University. Carol is co-author and editor of the OTiS e-Workshop publications including an international e-book on Online Tutoring Skills and a collection of 80 case studies. Over the past four years Carol has co-authored and edited a variety of publications online tutoring and elearning.

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1 Introduction

The role of the teacher in Higher Education is changing rapidly, and much of this change is as a result of the introduction of e-learning. Teachers are now expected to share their role as course designers with many other professionals working in their institution while taking on a bigger role in the technical and resource discovery aspects of course design. In addition, teachers are being encouraged to share their teaching resources with others, while being urged to reuse materials created by others as much as possible. Having courses online opens up a teacher's course and course design to far greater scrutiny than ever before and teaching practice is changing from the teacher as 'sage on the stage' to the 'guide on the side'.

With all of these changes and new pressures for teachers, it is important to put e-learning into perspective and examine what it really means for your practice, where help can be found both within and outside of your institution, and what the future might hold for all those who have a teaching role in higher education.

This guide aims to do all of these things, as well as examining emerging pedagogical issues that arise from the use of technologies in teaching. Here you will find information, advice and guidance that will help you make appropriate and effective use of e-learning to support your students. It will enable you to:

- gain an understanding of e-learning technologies and their potential to enhance student learning;

- set the use of these technologies within an institutional context;
- make informed choices as to how you can embed e-learning within your own practice;
- identify and establish appropriate partnerships essential to implementing effective e-learning.

The guide is structured around a list of key questions frequently asked by teachers (Section 3). These questions should be related to the local context of your institution and your subject discipline where applicable. Your responses will vary according to your level of expertise in e-learning as well as your familiarity with different forms of learning and teaching. Section 4 has links to a variety of resources that will help you further plan, design and implement effective e-learning.

Even if you have used learning technologies before, you should find resources in this guide that will help you to extend your knowledge. The guide also relates e-learning to national drivers such as widening participation which have an effect on your teaching practice.

2 Definitions

2.1 What is e-learning?

e-Learning is the currently fashionable term used to describe the diverse use of information and communications technologies to support and enhance learning, teaching and assessment - from resource based learning (in which students carry out face-to-face tasks supplemented by a range of online resources) to fully online courses.

The LTSN Generic Centre (2002) define e-learning as 'learning facilitated and supported through the use of information and communication technologies'. The Association for Learning Technology (ALT) state that 'learning technology makes use of a range of communication and information technologies to support learning and provide learning resources. ALT believes that learning technology adds value to both the efficiency, and the effectiveness, of the learning process' (Seale & Rius-Riu, 2001, p. 3). Key elements in both these definitions is the use of communication technologies and its use to support learning.

Previously used terms include Communications and Information Technologies (C&IT or ICT), Learning Technologies, Information and Learning Technologies (ILT, mainly used in Further Education), Networked Learning (Goodyear, 2001), Telelearning or Telematics (more commonly used in Europe), and Instructional Technology (more commonly used in North America).

e-Learning provides a range of technologies including:

Generic software applications, which includes word-processing, databases, and

spreadsheets, as well as statistical and qualitative data analysis tools. Students can use these to develop their skills and understanding, develop ideas and hypotheses, and present their results and findings.

Presentation technologies, which are widely available, include software such as Microsoft PowerPoint, digital projectors, and interactive whiteboards.

The **World Wide Web** (or the Web), which provides access to a range of digital resources including online libraries, journals, databases, and datasets. The Web can form the basis of many types of learning such as resource, enquiry, or problem based learning.

Computer Mediated Conferencing (CMC), which includes e-mail, discussion boards, bulletin boards, and chat tools. CMC can be used to support many types of discursive or collaborative activities.

Multimedia materials, which include graphics, pictures, photographs, animations, film, video, and sound. Multimedia can support a variety of student learning styles - some students prefer to read, some to watch, some to listen and some to experience.

Computer Assisted Assessment (CAA) is automated, online objective testing. This can be automatically marked and can provide immediate and individual feedback to students.

Computer Assisted Learning (CAL) or **Computer Based Learning** (CBL) simply means any use of a computer to support learning. The most common use is for online tutorials, which can combine text, animations, sound, video, quizzes, and feedback, in a structured framework. Students usually navigate CAL tutorials in small, guided steps to develop their knowledge and understanding of a topic.

Audioconferencing and **Videoconferencing** involve the use of

audio and visual communication, via phone lines or the Web. These can be used with applications, such as Microsoft NetMeeting, which allow you to simultaneously conference, edit documents, communicate via chat, and design a product on the shared online whiteboard.

Streaming audio and video includes digital audio and video delivered via the Web. This can provide an alternative or supplement to text. It can be used to give students access to real life situations that are otherwise inaccessible, for example, social work case studies, natural disasters, or medical conditions and treatment.

Simulations and models allow students to explore real world environments, and develop practical skills. These allow students to practice tasks in a safe environment, as well as helping them to integrate theory and practice for real laboratory experiments or field trips.

Microworlds and games can enable students to learn through experimentation. A microworld can be described as a simulation combined with a case study scenario. Within games, online personas known as avatars can be used to represent interactions within a simulated environment.

Visualisation tools can be used to represent complex sets of data in a visual way. Examples include weather systems, topography, financial and economic systems, as well as medical imaging.

Although these technologies can be used on their own, it is by combining a variety of information and communication technologies that you can harness the true potential of e-learning. Together, they provide you and your students with new ways of talking to each other, new ways of learning, and new kinds of communities. This allows you to engage students more actively in their learning (this theme is

developed further in Section 3.4).

By integrating these tools, a rich Virtual Learning Environment (VLE) can be created.

A **VLE** is a web-based online environment that integrates tools for content delivery, communication, assessment, and student management. Most Further and Higher Education institutions have already implemented a VLE. Some Universities have developed bespoke, in-house systems such as:

Colloquia (<http://www.colloquia.net/>);
COSE (<http://www.staffs.ac.uk/COSE/>).

When a VLE is linked with other systems such as finance, student information, and library management it is called a Managed Learning Environment (MLE). An MLE allows data to be integrated and shared across all institutional systems.

3 Questions and Answers

3.1 Why should I use e-learning?

Generally e-learning is seen as offering solutions to several challenges currently facing HE. These include the move towards lifelong learning, with its ongoing demand for continuous professional development, and the drive to widen participation. These challenges come at a time of increasing pressure on resources, and the increasing diversity in the student population and their modes of attendance, including learning that is part-time, at a distance, open or flexible, and work-based.

e-Learning can improve the flexibility and quality of learning by:

- providing access to a range of resources and materials which may not otherwise be available or accessible, for example graphics, sound, animation, multimedia;
- giving control to students over when and where they study;
- allowing students to study at their own pace;
- providing a student centred learning environment which can be tailored to meet the learning needs of individual students;
- creating an environment that promotes an active approach to learning;
- supporting increased communications between staff and students, and amongst students;
- providing frequent and timely individual feedback, for example through computer assisted assessment, and positive reinforcement;

- motivating students through appropriate use of interactive courseware;
- supporting and encouraging collaborative learning;
- supporting economic reuse of high quality, expensive resources;
- encouraging students to take responsibility for their own learning.

It is important to remember that e-learning does not necessarily imply distance learning, therefore not all tasks and feedback have to be carried out using the technology. You can combine a range of approaches including online, face-to-face, tutor led and resource based learning. This **blended learning** approach can provide students with an effective environment for learning. Feedback gathered from students has shown that they rate this blended learning approach more highly than other forms of delivery.

However, many lecturers feel pressured into adopting e-learning without sufficient support or evidence that the change will be worthwhile. This section addresses some of these concerns.

Is e-learning worth my time?

e-Learning requires investment of time and effort in developing new skills, new approaches, and new resources: perhaps time and effort that would otherwise be spent on research. However, you can save time and effort in the long term. For example, you may create banks of flexible resources that can be reused, you may design learning activities that can be

redeployed, or you may produce CAA that will allow you to cope with increasing student numbers with no increase in marking time. The key to improving the effectiveness and quality of student learning and making it worthwhile is to replace existing traditional modes of teaching with more active and engaging learning opportunities, delivered where appropriate by e-learning (Sections 3.4 and 3.5).

What will students expect?

With most 16 year old students using the Internet regularly for support with homework and 67% of 16 year olds authoring web pages, (usually as part of a school project), students themselves will increasingly expect technology to play a part in their learning (DfES, 2002, Becta, 2002).

Students also expect to be able to work and learn at the same time and, therefore expect flexible access: something which e-learning can provide.

What are the benefits for me?

e-Learning could benefit you by:

- reducing the administrative load by making routine information available online. This will release more time for other activities;
- making communication easier with individual students and groups of students;
- making it possible to use a wider range of resources that may otherwise be too difficult or expensive to use;
- reducing assessment and marking loads through the use of CAA and CMC;
- motivating and supporting students to take responsibility for their own learning;
- supporting an increasingly large and diverse student population with little increase in teaching time;
- releasing time for more active, engaging and interactive forms of teaching;
- making it easier to amend and update materials;
- contributing to Quality Assurance Agency (<http://www.qaa.ac.uk/> institutional audits.

e-Learning offers practical ways of dealing with some of these challenges and can help shift your role from that of instructor to a guide and facilitator of students' learning.

Finding examples and evidence

The following collections of case studies describe the benefits and challenges of e-learning by describing the experiences of real teachers who have already tackled these issues:

The Learning and Teaching Support Network's (LTSN) twenty-four subject centres (<http://www.ltsn.ac.uk>) publish discipline-based case studies on the use of e-learning on their web sites and in their journals;

The LTSN Generic Centre has a database of case studies on Learning Environments and Pedagogy (LEAP) particularly focussing on the use of VLEs to support learning (<http://www.ltsn.ac.uk/genericcentre> > Projects > e-Learning);

The Online Tutoring Skills project contains eighty case studies on online tutoring,

communication, and collaborative working (<http://otis.scotcit.ac.uk>);

The TALISMAN/LTDI Videoconferencing Case Studies contain twelve case studies on the use of videoconferencing for learning and teaching in HE and some reflections on the lessons learned through these experiences (<http://>

www.icbl.hw.ac.uk/ltidi/ltidi-pub.htm#VCStudies);

The Learning Networks: Communication Skills (LNCS) project documents users' experiences and perceptions of both computer mediated communication and audio/video conferencing (<http://www.gla.ac.uk/lncs/index.htm>).

3.2 Where do I start?

Where you start from depends on why e-learning is being adopted, for example e-learning initiatives can be at institutional, departmental or course level. The most appropriate starting point will depend on the driver, which could be:

- an institutional or departmental policy or drive (for example the purchase of a VLE or a move to problem based learning);
- a particular teaching problem (for example students experiencing difficulty with a particular concept, or dealing with an increasing number of students with no additional resources);
- personal interest (for example enthused by a colleague, attendance at a conference, or a positive personal experience of a particular technology).

Other factors that will determine the starting point include:

- your technical abilities and confidence;
- your students' IT skills and confidence;
- the learning technology available and supported within your institution;
- the advice and support available.

You can quickly test your understanding of learning technology and computer assisted assessment by taking the 'Anorak Rating System' test at University of Bristol (<http://www.ltss.bris.ac.uk/anorak.htm>). A low anorak rating suggests you should start exploring e-learning at a simple level and use centrally supported technologies. Anorak Level 4 or 5, suggests you have the necessary experience to explore areas of e-learning that are not centrally supported or which are more technically demanding. There is also a special 'Anorak Rating for computer assisted assessment', an area which is becoming increasingly important in HE.

The general rule of thumb is to start simple and move towards the more complex, for example (Bain, 2000):

- supporting students via email;
- making simple resource material available on the web;
- integrating the use of a multimedia CD-ROM into a module;
- using an online discussion forum for interaction between students and tutors;
- integrating web-based activities into a programme;
- introducing online collaborative group work;

- developing interactive web-based course materials;
- using computer assisted assessment for formative or summative assessment and feedback;
- introducing audio or video conferencing for collaborative projects or tutorials;
- creating an integrated, online learning experience which incorporates several of the above.

How and where is e-learning being used?

Section 3.1 introduced some resources that give a picture of where and how e-learning is being used nationally. The next step is to find out what e-learning is already being implemented within your department, school, faculty or institution, and what technology is available and supported centrally.

Who has already adopted e-learning in my institution?

Contact your learning and teaching support unit or its equivalent to find out who is already using e-learning within your institution. Information that may be available includes case studies, briefing sessions, examples of use, and contact details of users.

What learning technology is available and supported centrally in my institution?

This may include a VLE, CAA package or a streaming media server. You should be able to access these systems easily and they are likely to be around for a while, however it may be necessary to identify and contact one or more central support

units to find out about procedures for getting access to the technology, support materials, and training. You also need to check that students will have adequate access to IT facilities: that these will be available when needed, can cope with demand, and provide flexible and open access.

What e-learning is being used in my faculty, school, or department?

There may be CAL packages, simulations or specialist software already available and in use in your department - you can find out from colleagues and support staff. You may encounter technical problems resulting from upgrades to central IT facilities, for example CAL packages not running if the operating system on student PC facilities is upgraded. Specialist support may be available from software suppliers, user groups, colleagues in other institutions, and LTSN subject centres.

What technology is available for my discipline or teaching approach?

If you are thinking about implementing e-learning as a personal initiative, then you will find it much more challenging. This is because most of the responsibility for administering and supporting it will fall on you, so when problems arise they will take longer to resolve. User groups and LTSN subject centres will be a good source of help and advice for discipline specific innovations.

Where do I get help and support?

Effective e-learning is a team effort which will require collaboration with a range of colleagues including librarians, support

staff, learning technologists and educational developers. Support can be found at institutional and national levels and it is available in a variety of forms. For example:

- designing your courses from a learning and teaching support unit;
- implementing your course from a learning technology unit;
- sourcing available resources from the library.

Every university has a unique approach to staff support, though these generally fall into three categories (McNaught, 2002):

1. An integrated approach that combines support in technology, audio visual and educational development.
2. A parallel approach in which educational development and e-learning support are within distinct units, (i.e. Learning and Teaching Support Unit and a Learning Technology Unit).
3. A distributed approach in which a range of support units emerge.

Many of the questions you need to ask are about knowing your institution and how it operates. Details about how your institution operates can be found by exploring the website; asking colleagues; discovering and understanding what

support departments exist and what they do.

Everyone has different levels of technical ability. If you are technically competent, you may be interested and/or skilled in:

- writing web pages in html, xhtml, java and javascript;
- creating multimedia resources which may involve the use of paint, graphics, drawing and animation packages, digital photography and image manipulation and processing, digital video and sound creation and editing;
- creating CAL/CBL packages through the use of specialist authoring software.

The vast majority of teachers want to implement e-learning without learning complex technical skills. The increasing adoption of systems such as VLEs, CAA software and off the shelf CAL packages makes this possible. Sources of help may include education and media design support, audio-visual support, and other specialist services.

So, perhaps the most important question you need to address is “What resources and support are available to help me select appropriate e-learning technologies and create e-learning materials and resources?”

3.3 What are the costs and benefits?

The costs and benefits of e-learning are difficult to quantify due to the large number of variables involved. Each institution will have to decide whether the benefits outweigh the costs in its particular context. A JISC funded project on the “Costs of

Networked Learning”, at Sheffield Hallam University, (<http://www.shu.ac.uk/cnl/>) has developed an activity based costing model for school/faculty implementation of e-learning, which allows the analysis of the costs and benefits in a more detailed and

systematic way.

A key challenge in making this decision is that while many of the costs are specific and measurable, for example the cost of technology, and the cost of your time and the effort involved, many of the benefits are not. Perceived benefits include greater flexibility, improved access, widening participation, and increased student involvement in, and ownership of, their

own learning. Therefore, while we cannot claim that teaching with technology reduces costs, it can increase the quality of learning. However, these benefits only come if e-learning innovations are carefully designed and used appropriately. The following sections outline a number of key issues to be addressed to ensure that e-learning innovations are appropriate and effective.

3.4 How do I get the students involved?

It should not be assumed that students who are familiar with computers are already skilled in e-learning. Even though students may routinely use computers to access the Web or for social purposes, they will not necessarily view it as a tool for learning. According to Chickering & Ehrmann (1996) there are seven key issues in encouraging student involvement in learning. They state that good practice in learning and teaching:


1. Encourages contact between students and lecturers.
2. Develops reciprocity and cooperation among students.
3. Encourages active learning.
4. Gives prompt feedback.
5. Emphasises time on task.
6. Communicates high expectations.
7. Respects diverse talents and ways of learning.

Use of this framework to develop appropriate and effective e-learning, is discussed throughout this section.

How can I encourage contact between students and teachers?


The degree to which teachers interact with students depends on the teaching methods adopted. The most widely used teaching method in HE is the lecture combined with the tutorial. This method infers the transfer of blocks of information from the teacher to the student during the lecture. The problem with this method is that there is little opportunity for students to ask questions and formulate ideas. Although students can ask questions during tutorials, they do not always connect these with the concepts presented in lectures. Early forms of computer assisted teaching mirrored this form of teaching, with the lecturer being substituted by a computer. This often led to teaching that resulted in poor student participation and low motivation (Brown and Duguid, 1996 and Mayes, 1995).

It is now recognised that students learn effectively when they are actively involved in solving problems and discussing their ideas with teachers and other students. Current models of education place



emphasis on these student activities (Section 3.5). These models assume that students do not learn simply by accessing information. Rather students construct their ideas and understandings of concepts through interactions with teachers, other students and with learning materials (Palinscar, 1998). Therefore, effective e-learning will include tasks that students can carry out (either online or offline) in order to learn.

How can I encourage student co-operation?



Interactions with students online will be very different from those experienced during face-to-face sessions. When teaching online you will not have the same signals to indicate how students are progressing that you get in face-to-face teaching. For example, in a face-to-face tutorial you have the opportunity to question students to ascertain their level of understanding of a concept, hear their tone of voice, and observe their body language. Online you will not have these body language cues. Equally, students will miss non-verbal cues from each other and from you. Therefore, you need to encourage students to pro-actively seek feedback, guidance, and clarification from you, and each other. Setting or negotiating clear “ground rules” for the class at the start can help encourage this. New forms of learning require new kinds of etiquette. Two examples are:

PACE (Kennedy and Duffy, 2000). PACE is a mnemonic for the words Participation, Addition, Constructive criticism and Encouraging. These are key principles for responding to the contributions that your and your students make to discussions.

Carl Roger’s principles of communication (Zimmer and Alexander, 2000). Learners can act as tutors for one another easily if they follow the Rogerian communication principles i.e. if they offer their individual creative insight, their receptiveness and their understanding to one another, and avoid imposing dogmatic, judgemental demands.

How do I encourage active learning?

In the 1980s and 90s online courses were frequently designed as large, monolithic modules which were rich in terms of information and content, but poor in actively engaging the student. There was a general confusion that access to content resources (for example, “clicking” a hyperlink to access another webpage) would engage students in their own learning (Koper, 2003). Resulting from this, these courses often emphasised **content**.

More recently, online courses have focussed on actively involving students in learning by requiring them to carry out **tasks**. As a result, online courses are now designed in small sections comprising learning tasks with associated content. Content can be obtained from existing sources, much of which may already be in digital format (for example, articles, lecture notes, PowerPoint slides). The key issue teachers may face is designing tasks that will effectively engage students in thinking about, discussing, and applying concepts. For example, you may ask students to collaboratively design an artefact (such as a building, a course, a molecule). During the design process, students will have to find and discuss information as well as working out how to construct the final product. Alternatively, you may use short,

regular computer assisted assessment to provide feedback and identify areas of difficulty before a face-to-face tutorial.

How can I ensure prompt feedback and time on task?

A major advantage of e-learning is that prompt feedback to students can be given. This can be done in a variety of ways. At a simple level, e-mail can support lecturer-to-student feedback. However, this form of communication can be disjointed and it can be difficult to manage the information flow. At a slightly more sophisticated level, online discussion lists will allow the development of more meaningful dialogue with students that can be shared within a group. These discussion lists can hold evidence of student coursework or a variety of learning resources collected by students that can be commented on by all participants.

It is important to ensure that students spend time on learning tasks, rather than sorting out technology problems. Therefore, it is important that they have an appropriate induction, and good access to a range of help facilities, such as helpdesks, user guides and a list of frequently asked questions. These should be accessible by phone, e-mail, face-to-face and online. When teaching online developing a good relationship with the central services that support the technology will be a crucial foundation of a successful student experience (see the Guide for support staff in this series). Further suggestions on student induction and support can be found in Gilly Salmon's E-moderating book (2000).

How can I motivate students by communicating high expectations?

There is evidence to suggest that students will respond positively when you communicate high expectations of them. There are several ways to achieve this including: use of e-learning to incorporate real life problems and tasks into classes; use of high quality, multimedia resources to enrich their learning experience; use of resources that present conflicting perspectives, which challenge students to evaluate and analyse the quality of the resources, as well as synthesising diverse ideas.

How do I manage diversity?

e-Learning can support a variety of learning styles as well as making resources accessible to a wide range of students. In the UK, legislation was recently passed to ensure that all learning and teaching was accessible, through the Disability Discrimination Act 1995 (DDA 1995), the more recent Special Educational Needs and Disabilities Act 2001 (SENDA, 2001) and also the European Legislation. Therefore, it is important to ensure that resources follow these guidelines. It is relatively easy to make online or mixed mode courses accessible. This is because, unlike paper-based resources, e-learning content can be reformatted to meet the needs of individual students.

By using the approach to course design described in Section 3.4 (i.e. encouraging active learning by designing courses in small sections comprising **content** and learning **tasks**) it is easy to update and replace individual resources in the format


most accessible to students. Storyboards (Section 3.5) are useful for planning strategies for accessibility.

Most universities have special needs advisors who can provide advice and guidance on the development of accessible content. Further guidelines and resources are freely available from the JISC TechDis service (<http://www.techdis.ac.uk/>

www.techdis.ac.uk/). For example the TechDis Web Accessibility and Usability Resource can help assess the accessibility and usability of online resources for students with a range of special needs (<http://www.techdis.ac.uk/seven/>).

Producing well-designed and accessible courses will benefit all students, not only those with special needs.

3.5 How can I design effective courses for students?



In order to design a course well, it is useful to have an understanding of how students learn. Current theories of learning focus on the role and activities of the student rather than those of the teacher. To understand some of the current theories, it is useful to understand the ideas behind the Zone of Proximal Development, developed by Vygotsky in 1962. Vygotsky (1962, 1978) believed that children learn more effectively when they are guided by an “expert” (usually an adult, such as a parent). Talking with and asking questions of the adult allows children to refine their thinking and ideas. This enables the children to build, or “construct” new ideas from their existing knowledge: therefore the Zone of Proximal Development forms the basis for current “constructivist” theories of adult learning. From a constructivist perspective, learning is an active process in which learners construct new ideas or concepts based upon their current and past knowledge. In order to help students do this, teachers engage in a process of “scaffolding”, in which they encourage students to discover principles by themselves, rather than by telling them.

Central to this process is the **dialogue** between the teacher and student, and amongst students, enabling the student to continually build upon what he or she has already learned. Several models of learning through learning technology, based on Vygotsky’s theory, have been developed. Two of the most widely known are The Conceptualisation Cycle by Mayes (1995), and The Conversational Framework by Laurillard (2002).

Conceptualisation Cycle

An important aspect of Mayes’ Conceptualisation Cycle is that it can help plan how to support student learning, by giving students resources, activities and feedback through dialogue with teachers and with their peers. It is important to remember that this does not have to be done entirely online. Although students may access learning resources via a course website, activities and feedback can be completed during face-to-face sessions.

In 1995, Mayes classified the “interactivity” levels of a large number of online course

websites. He concluded that many websites had little if any interaction. In Mayes' study, online courses were classified according to the level of communication available to students. There were three levels to the classification: primary, secondary and tertiary. Much of the material found by Mayes lay at the primary courseware level, in which information was conveyed to the students (for example online lecture notes and reading lists). There was little evidence of secondary courseware, which could have been used to question students and encourage them to reflect upon their learning (for example online tests and quizzes). There were even fewer examples of tertiary courseware in which dialogue was achieved (for example online discussions, or simulations). However, according to Mayes, it is only at this tertiary level of interactivity that learning occurs.

Consideration of Mayes' classifications is useful when starting out in e-learning because it is practical to begin developing online materials at the primary level. However, it is important to ensure these resources are fully integrated into mainstream teaching to ensure students are provided with sufficient support for their learning. This support does not have to be fully online and can be facilitated during face-to-face sessions. This approach, partially online and partially face-to-face, (referred to as **blended learning**) is particularly useful with campus-based learners. Although it is useful to begin by developing primary courseware, it is important not to stop at this stage. When experience has been

gained in developing courses using e-learning, it is important to move onto developing secondary and tertiary level courseware.

Conversational Framework

The Conversational Framework model was developed by Laurillard in 1993 (2002), based on Vygotsky's ideas. Like Mayes' model, it also emphasises the dialogue between the teacher and students as well as amongst students. Laurillard stresses that, for higher level learning, this dialogue must take place at both theoretical and practical levels. This enables students to link theory with practice (which is sometimes difficult to achieve in many subjects), and allows the teacher to evaluate whether or not they have set appropriate tasks for their students.

One of the major characteristics of this model is the way in which interactions, both student-teacher and student-student, take place. In face-to-face teaching, many of these interactions are so spontaneous and instinctive that they can be overlooked in the design of e-learning. Therefore, Laurillard talks about these interactions explicitly. e-Learning can support these interactions by being:

- **narrative** - teachers' conceptions are made accessible to students and vice versa;
- **interactive** - the teacher provides feedback to students based on the outcomes of tasks students undertake;

- **adaptive** - the teacher uses this information to revise what learning has occurred and, if necessary, change the focus of dialogue;
- **communicative** - the teacher supports processes where students discuss and reflect upon their learning;
- The teacher and student agree learning goals and task goals, which can be achieved using **productive** media, such as online presentations.

This emphasises the importance of making these interactions explicit. More information on these educational models is available from the ELICIT online tutorial entitled "Introduction to the use of Communications and Information Technology for Teaching and Learning" (ELICIT, 2001).

How do I go about designing my course?

When you start designing e-learning courses, it is important to do this as efficiently and effectively as possible. A step-by-step approach to designing a course using learning activities is outlined below, based on ideas by Conole and Oliver (1998). The design cycle has 7 stages:

1. Specify the aim and learning objectives.
2. Consider the needs of the learner.
3. Design the learning activities and assessment by answering these questions:
 - what are the core concepts?
 - what activities are students asked to do to learn this concept?

- how do you know the students have understood this concept?
 - when is it appropriate to find out if they have understood this concept (by assessment)?
 - what feedback do they get and from whom/what ?
 - how is the technology adding value this process?
4. Plan this learning activity as a clearly documented storyboard.
 5. Decide how to integrate this into your mainstream teaching using this checklist.
 6. Create the learning activity - checking that the interface design is consistent.
 7. Run and evaluate the course.

In order to produce a well designed course, whether online or paper based, the design needs to be based on clearly defined **learning objectives**. As discussed earlier, in order to ensure active learning, learning objectives must have associated learning **tasks**. In order to carry out these tasks students may require access to information **resources**, such as course readings, texts, simulations etc. When students have completed these tasks, either individually or in groups, they require **feedback** to clarify whether their ideas are accurate. This feedback is a dialogue between the teacher and student, and amongst students, allowing them to refine their ideas.

It may be useful to consider these questions when designing an online course:

- What are the **learning objectives**?
- What **tasks** will the students carry out during the course?
- How do the tasks help meet these learning objectives?
- How will the students access any required **resources** (online texts, articles, information)?
- How will they gain **feedback** by communicating with each other as well as yourself?
- What tools are required for feedback (online discussions, chat facilities, computer aided assessment, face-to-face discussions, etc)?

How can I plan effective activities for students?

A useful technique in planning an online course is “storyboarding” (Littlejohn, 2002). This technique is commonly used in scripting plays and involves linking activities, resources and roles within a common environment. Used in a course design context, you can plan online courses as a series of learning activities, with defined roles for students and teachers. This involves documenting individual activities and linking these together in an overall plan outlining:

- the aim of the activity;
- how teachers and students will interact (for example online discussions or groupwork);
- the resources which are available to the students (for example texts, simulations and so on), which they will use to carry out the activity;
- how the students will receive

feedback (for example from teachers, peers or through formative computer marked assessments).

The Journal of Interactive Media in Education (<http://www-jime.open.ac.uk/>) provides an example of how resources can be linked to a discussion facility to support and encourage a multi-way dialogue between the authors and readers of the journal.

Although drawing a storyboard will take time, it has three major advantages. Firstly, the more time spent planning the course before it is implemented electronically, the more effective it is likely to be. Secondly, reusability of the storyboard - when the course is updated individual resources or activities can be easily substituted (Oliver and McLoughlin, 2003). A third benefit is that storyboards can help plan how to support students with special needs.

Once the course activities have been planned using a storyboard, the course can be constructed by linking these activities within a VLE.

Where can I find teaching materials?

There are several ways of sourcing good teaching material: through search engines, LTSN subject centres and subject gateways or portals. However, a good place to start is with your own resources:

Self generated resources – you will have a variety of self-generated resources to hand, for example lecture notes and PowerPoint slides.

Digital libraries and repositories - most University libraries enable access to digital journals and books. You can easily identify

appropriate resources with the help of subject librarians and then integrate them into online courses. A further advantage of a digital library is that the resource items can be made available in multiple formats (for example simulations, animations, video, images etc). Multimedia learning and teaching resources can be accessed in a variety of ways:

- through the Learning and Teaching Support Network subject centres <http://www.ltsn.ac.uk>;
- through search engines (such as Google <http://www.google.co.uk> or Alta Vista <http://uk.altavista.com>);
- via subject gateways which you can access via the Resource Discovery Network (<http://www.rdn.ac.uk>).

Reusing materials produced by others

- before creating new digital resources, find out what existing resources are available within your department, faculty or institution. Although these existing resources may not exactly match your learning objectives, you may be able to repurpose these resources for your own use. Guidelines are available from the Centre for Educational Technology Interoperability Standards (CETIS) for repurposing and reusing materials (<http://www.cetis.ac.uk>).

Copyright issues – when reusing materials produced by others you must ensure you have permission from the copyright holder to do so. Many institutions have a digital copyright officer. JISC has produced a short briefing paper on Copyright and Intellectual Property Rights (IPR) (JISC, 2001) and also has a Legal Information Service (<http://www.jisc.ac.uk/legal/>) which can provide current legal information.

The suitability of these resources for use in your online courses will have to be evaluated. The criteria and process of evaluation of e-learning materials are less

well defined than that of “print” materials. Criteria could include educational benefits, ease of use of the resources, ease of maintenance as well as costs and benefits. The Resource Discovery Network (RDN) Virtual Training Suite tutorials cover evaluating Web resources (<http://www.vts.rdn.ac.uk/>). It may be cost effective to buy some of the growing variety of resources available from publishers. However, these are only available in limited subject areas and can be expensive.

How do I evaluate my course?

An important aspect of teaching, especially when adopting a new methodology, is to continually reflect upon, and improve, teaching practice. Effective course evaluation is always planned from the course development stage and not added on at the end. Oliver and Conole (1998) have developed an evaluation framework which complements their 7-stage course design framework (Conole and Oliver, 1998) discussed earlier. This evaluation framework can be used to plan and design an evaluation for e-learning innovation. More information about effective evaluation techniques and methods can be found from the Evaluation Cookbook (Harvey, 1998).

Will my role change?

Undoubtedly the adoption of e-learning will change the teaching role. This is partly due to the nature of the technology and partly due to new approaches to teaching. For example, if the course changes from a traditional lecture/tutorial method to a problem-based learning approach this will

involve a shift in what you do. Less time will be spent in the transmission of information (i.e. lecturing) and more time supporting students to enable them to become self-directed and autonomous learners. New responsibilities will be developed relating to teaching (such as moderating online discussions) and related to the technology (for example providing content in a variety of formats – not just paper).

It is likely that former tasks will be lost or shared, many of which will be related to using technology. You may no longer have full control of the learning environment and will work in collaboration with support staff including learning technologists, IT support staff, learning resources staff, and audio-visual staff. Letting go of familiar, comfortable practice and adopting new ways of doing things can be a painful process and you may have to reflect upon, and take account of, any anxieties you may have.

The types of new skills teachers may have to acquire include:

- resource discovery, through portals, gateways and search engines;
 - using a VLE or MLE;
 - making resources available in a variety of accessible formats;
 - providing feedback to students;
 - devising, implementing and managing online tasks;
 - managing online courses;
 - blending forms of face-to-face and online learning;
- implementing computer aided and computer managed assessment;
 - authoring digital resources;
 - moderating online discussions;
 - enabling students to upload digital resources (for example assignments, learning materials, etc);
 - checking copyright of externally sourced resources;
 - helping students develop appropriate e-learning skills and strategies, including good academic practice;
 - assuring the quality of online resources.

Will e-learning take more of my time?

e-Learning requires rigorous attention to design. This is mainly because there may be less flexibility during “classes” than in face-to-face teaching (although many would argue that traditional courses should be more rigorously designed as well). Therefore, when designing an online course time will be spent differently, and workloads will have to be planned and managed effectively. Unfortunately traditional timetabling does not always allow for this different distribution of time, so you will have to be aware of how working patterns will change and manage your own time accordingly.

More time will be spent “up front”, before the class begins, on course design and resource and task preparation. This time will be well spent because, once the resources and tasks are in place, you will have less work in preparation for the following year than would have been

required for a paper based course (for example there is no requirement for notes to be photocopied and distributed).

Overall, the time spent on tasks can be the same as for face-to-face teaching, but it will be significantly redistributed. Initially, inexperienced online tutors may find that they spend more time on e-learning. However, as with traditional teaching methods, the more experienced you become, the less time you will require to produce effective results.

In face-to-face situations discussion and feedback will normally happen within predefined hours (i.e. during a class). However, online discussions are usually asynchronous (i.e. spread over a time period). This means that teachers will have to logon at regular intervals and spend time giving feedback and encouraging student participation. In the space of a 10-week course, you may have to logon every day, or at least every second day, for a short period of time, so it is important to include this in your schedule.

Online discussions can be time consuming. However, there are a variety of coping strategies that can reduce the time spent on a task: "E-moderating" (2000) and "E-tivities" (2002) by Gilly Salmon outline many of these approaches. For example, when giving feedback, students may have problems with the same concept. A "standard" feedback reply can be created, which can then be easily edited and tailored for each individual student.

Overall, the time required for e-learning activities can be the same as for face-to-

face tasks. However, these tasks potentially have greater impact and may be more efficient in terms of student learning.

How do I manage the technology?

e-Learning is technically more complex than face-to-face teaching so you will have to prepare and plan accordingly. As discussed in the previous section, this can initially take more time but, as you become familiar with the technology, it can also save time. When using e-learning to support a face-to-face session such as a lecture or tutorial prepare in advance by:

- finding out what resources are available in the room you are using, including the computer, network connection, data projector and lighting;
- get someone to show you how to use them, for example audio-visual support or lecture room services;
- find out what immediate help facilities are available, for example emergency phone numbers or on-hand technical support;
- practice using the equipment before actually needing to use it.

All technology is likely to fail at some time. Therefore, it is useful to have backup plans in place. This may include taking limited backup OHP slides or handouts to lectures, allowing flexible time scheduling for classes, or having a couple of replacement tasks to slot into place. These could include pair and group-work activities, discussion topics, question and answer revision sessions, examples and practice tests. However, learning technologies are increasingly reliable and

institutions are spending more money and resources to ensure the quality of service that has become essential for core functions of their 'business'.

Will students stop attending lectures?

It is possible that some students will stop attending lectures. However, this largely depends on how the course is set up and how it is introduced to the students. For example, if the e-learning component is introduced as an alternative to other forms of learning then it may be a legitimate choice for students not to attend, allowing them to select the learning methods most appropriate to their needs and circumstances. However, if it is introduced as a supplement, then it needs to be made

clear how it adds value to the existing lectures and how they integrate with each other. In either case, even if students are spending less time in lectures, they may be using their time engaged in more effective learning activities.

Some teachers advocate using the e-learning component for information and content delivery, freeing up time in class for more interactivity with students. However, this may not be possible with large classes, and simple content delivered online can be an unexciting learning experience that could alienate learners. You may wish to get feedback from your students on the balance and blend of classroom time to e-learning delivery that they prefer.

3.6 Future developments

e-Learning systems are becoming more widely available. There are increasing expectations from a variety of stakeholders, including the government, employers and students, that e-learning will become a normal part of lifelong learning. e-Learning has the potential to:

- improve the quality of the learning experience by increasing flexibility and variety;
- alleviate the increasing pressure on existing, limited resources;
- increase and widen access to all forms of education.

VLEs and MLEs provide easy to use e-learning platforms for the majority of staff and students although, currently, these are often limited in flexibility and scope. If we

are to use e-learning in an educationally appropriate and effective way we need to ensure that the technology does not drive the learning experience. It is certain that e-learning systems will not replace good teachers and e-learning will not totally replace face-to-face education. However, e-learning will add value, offer a wider range of learning opportunities and support an increasing and more diverse student population.

4 Further Resources

The Learning Technology Career Development Scoping Study (Beetham et al., 2001) identified eleven “distinct *roles*” and twenty separate core activities involved in “supporting the co-ordination, development, use and support of learning technologies” or e-learning. This report has recently been supplemented by a series of briefing papers to disseminate its findings to key audiences in Higher Education, including academic staff – “Learning Technology: Key implications for Academic Staff” (JISC, 2003).

This section provides further resources helpful to teaching staff engaged in e-learning.

The **Learning and Teaching Support Network (LTSN) Generic Centre** has a large section of its web site devoted to e-learning (<http://www.ltsn.ac.uk/genericcentre/>). This includes Starter Guides, Learning Environment And Pedagogy (LEAP) case studies, staff development materials on Supporting Sustainable e-learning (SSeL), a section for learning technologists, and resources and links.

LTSN Subject Centres (<http://www.ltsn.ac.uk/>) are a network of 24 discipline based support centres, which advise on all aspects of learning, teaching and assessment, as well as e-learning.

The **JISC TechDis service** (<http://www.techdis.ac.uk/>) aims to improve provision for disabled staff and students in Higher and Further Education through technology. It provides an advice and information resource via extensive web-based databases and an email helpdesk.

The remainder of this section provides further resources and information appropriate for the questions asked in Sections 2 and 3.

What is elearning?

The online “Introduction to Learning Technology” guide (Calder and Milne, date unknown) at the University of Aberdeen gives a useful introduction to the topic.

More in-depth consideration of the issues can be found in the ELICIT online tutorial “An Introduction to Communications and Information Technology for Teaching and Learning (ELICIT, 2001).

If you prefer hardcopy then the “Implementing Learning Technology Guide” (Stoner, 1996) is a useful if a slightly dated practical guide

“Effective networked learning in higher education: notes and guidelines” (Goodyear, 2001), published by Lancaster University, provides a more in depth and research focussed introduction to e-learning.

The World Wide Web

Rius-Riu, M. (2002). Using the WWW in Learning and Teaching. *LTSN Generic Centre Starter Guide (1)*. Also available online from: <http://www.ltsn.ac.uk/genericcentre/index.asp?id=17730> [17 July 2003]

The Virtual Training Suite, discipline based online tutorials on using the web for learning and teaching (<http://www.vts.rdn.ac.uk/>).

Computer Mediated Communication

McAteer, E. & Harris, R. (2002). Computer Mediated Conferencing. [online]. *LTSN Generic Centre Starter Guide (3)*. Available from: <http://www.ltsn.ac.uk/genericcentre/index.asp?id=17730> [17 July 2003]

Using Computer Mediated Conferencing, an ELICIT online tutorial (ELICIT, 2001a).

Online Tutoring Skills e-book and Case Studies (Higgison, 2001).

Audio and Video conferencing

Using Videoconferencing, an ELICIT online tutorial (ELICIT, 2001b).

Videoconferencing Case Studies, a TALiSMAN/LTDI publication of twelve case studies on the use of videoconferencing for learning and teaching in higher education and some reflections on the lessons learned through these experiences (Alexander et. al., 1999).

The Video Technology Advisory Service (VTAS) (<http://www.video.ja.net/>) provides advice and information on all aspects of videoconferencing.

The Learning Networks: Communication Skills (LNCS) project covered both computer mediated communication, and audio and video conferencing. It explores the characteristics of current conferencing technologies and the communication skills required for their educational use. The project web site provides a distillation of its findings (<http://www.gla.ac.uk/lncs/index.htm>).

Computer Assisted Assessment (CAA)

Seale, J. (2002). Using CAA to Support Student Learning. [online]. *LTSN Generic Centre Starter Guide (4)*. Available from: <http://www.ltsn.ac.uk/genericcentre/index.asp?id=17730> [17 July 2003]

Developing and Implementing CAA, two ELICIT online tutorials (ELICIT, 2001c, 2001d)

The JISC Plagiarism Advisory Service (<http://www.jiscpas.ac.uk/>) provides generic advice on plagiarism prevention, and access to a national plagiarism detection service.

Computer Assisted Learning (CAL)

Developing your own CAL is technically demanding and requires a range of skills outside the scope of this guide.

LTSN Subject Centres often have databases of both commercial and non-commercial CAL (<http://www.ltsn.ac.uk>).

Teaching and Learning Technology Programme Phases I, II and III (<http://www.ncteam.ac.uk/projects/tltp/index.htm>) has developed CAL in some subject areas.

Streaming audio and video

Shepard K. (2002). Streaming Audio and Video for Course Design. [online]. *LTSN Generic Centre Starter Guide (3)*. Available from: <http://www.ltsn.ac.uk/genericcentre/index.asp?id=17730> [17 July 2003].

The JISC funded Click and Go Video Project has produced both a website and a book "Video Streaming: a Guide for Educational Development" to support staff in the use and

development of streaming media in learning and teaching (Thornhill et al., 2002).

Education Media Online (<http://www.emol.ac.uk/>), funded by the JISC, has a range of digital video resources, which are available to further, and higher education. These are free until 2006.

Managing Agent and Advisory Service (MAAS) Media Online (<http://www.bufvc.ac.uk/maas/index.html>).

The Moving Image Gateway (<http://www.bufvc.ac.uk/gateway/index.html>) is hosted by the British University Film and Video Council (BUFVC). MIG collects together websites that relate to moving images and sound and their use in higher and further education. The sites are classified by academic discipline (some forty subjects from Agriculture to Women's Studies) collected within the four main categories of Arts & Humanities, Bio-Medical, Social Sciences and Science & Technology. Each site has been evaluated and described by the BUFVC's Information Service.

LIFESIGN (<http://www.lifesign.ac.uk/>) is a JISC funded project to develop, catalogue and evaluate the use of streaming media in learning and teaching in the broad life sciences and health. It contains high quality digital video resources from the BBC, ShotList, HHMI, Viewtech and Biochemical Society, and use is free until 2005. [Note these resources can only be accessed from an ac.uk Internet address].

Multimedia learning materials

The Technical Advisory Services for Images (<http://www.tasi.ac.uk/>) is a JISC funded service that provides advice, help, resources and training on all aspects of digital image production and management.

An example of multimedia learning materials is the Virtual Seminars for Teaching Literature (<http://www.oucs.ox.ac.uk/ltg/projects/jtap/>). Materials include graphics, pictures, photographs, animations, film, video, and sound.

The LTSN Bioscience image bank is another example (<http://www.bio.ltsn.ac.uk/imagebank>). These images may be used on academic web pages, in lectures and PowerPoint presentations, online tutorials, tests, coursework, and in student presentations and projects.

Simulations and models

Technology support for simulations and models is usually discipline specific, therefore contact the appropriate LTSN Subject Centres (<http://www.ltsn.ac.uk>).

University of Bristol Medical Simulation Centre (<http://www.bris.ac.uk/Depts/BMSC/>)

Presentation technologies

The JISC Technologies Application of Presentation Technologies in UK higher education, is an online resource. It is a little dated in the software specific sections but the general advice and guidance is still relevant. (<http://www2.umist.ac.uk/isd/lwt/apt/>.)

Visualisation tools

A JISC funded Data Visualisation resources designed to help you make visual sense of specific types of data (http://www.jisc.ac.uk/index.cfm?name=rg_physci_cat_datvis).

Generic software

This includes any application software that you use in your day to day professional life that can also be used for supporting learning, for example spreadsheets, analysis software, and computer aided design and drawing packages.

VLEs and MLEs

Blackboard: (<http://www.blackboard.com/worldwide/gb/en/index.htm>).

First Class: (<http://www.firstclass.com/>).

The JISC “Introducing Managed Learning Environments Briefing Pack” contains 20 quick guides on various aspects of VLEs and MLEs (JISC, 2001a).

Lotus Notes: (<http://www.lotus.com>).

O’Leary, R. (2002). Virtual Learning Environments. [online]. *LTSN Generic Centre Starter Guide (2)*. Available from: <http://www.ltsn.ac.uk/genericcentre/index.asp?id=17730> [17 July 2003].

Using Virtual Learning Environments, an ELICIT online tutorial (ELICIT 2001e).

WebCT: (http://www.webct.com/uk_ireland).

Accessibility

Doyle, C. & Robson, K. (2002). *Accessible Curricula: Good Practice for All*. Wales: University of Wales Institute: Cardiff Press. Also available online from: <http://www.techdis.ac.uk/pdf/curricula.pdf> [21 July 2003].

Phipps, L., Sutherland, A. & Seale, J. (eds.) (2002). *Access All Areas: disability, technology and learning*. JISC TechDis Services and ALT. Also available online from <http://www.techdis.ac.uk/accessallareas/AAA.pdf> [21 July 2003].

TechDis service (<http://www.techdis.ac.uk/>) which aims to improve provision for disabled staff and students in higher and further education through technology. It provides an advice and information resource via extensive web based databases and an e-mail helpdesk.

Why should I use e-learning?

Section 3.1 outlined some of the major benefits that can accrue from elearning.

The companion guides in this series will provide complementary lists of benefits and costs from the different perspectives of Senior Managers, Heads of Academic Departments, Learning Technologists and Support Staff.

The most useful information will come from colleagues in your department, discipline or in other institutions.

The resources in Section 3.1 (examples and evidence), the resources at the start of Section 4, and your LTSN subject centre will also provide useful starting points.

The Fund for the Development of Teaching and Learning (FDTL) projects are available from the <http://www.ncteam.ac.uk/projects>.

The University of Bristol is leading a project investigating Students' Online Learning Experiences (SOLE) that reports in March 2004 (<http://www.sole.ilt.org/>).

Where do I start?

Find out what support units exist in your institution and what support, training and advice they offer. Some institutions, for example, provide funding for e-learning innovations where you have to put together a project proposal and bid for funds and support. There are usually support systems in place to provide you with support for planning innovations and writing bids. The LTSN subject centres also make small amounts of funding available for innovative teaching projects.

The LTSN Generic Centre e-learning resources which include starter guides and LEAP case studies (<http://www.ltsn.ac.uk/genericcentre/index.asp?id=17729>).

The University of Bristol, Learning Technology Service Support Guides at (<http://www.ltss.bris.ac.uk/guides.htm>). These include Introduction to LT, Implementing LT, CMC, Teleconferencing, VLEs, and Evaluation LT.

What are the Costs and Benefits?

In addition to the "Costs of Networked Learning" activity based costing model at Sheffield Hallam University (<http://www.shu.ac.uk/cnl/>), there are other models, mainly from the USA which can be used to evaluate the costs and benefits of e-learning.

The Insight Project, funded by the JISC is investigating the evaluation of the costs and benefits of IT Usage in a Higher Education Environment. Information and reports available at <http://www.mis.strath.ac.uk/predict/projects/insight/index.htm>

The Flashlight™ Cost Analysis Handbook version 2 (January 2003) from the Teaching, Learning and Technology Group in the USA (<http://www.tltgroup.org/programs/fcai.html>).

The **Technology Costing Methodology (TCM) Project** (USA started 1998) has produced a:

- TCM Handbook outlining policies and methodology utilised to calculate technology costs and TCM Casebook which is a compilation of implementation case studies from a selection of the TCM pilot projects. Both the Handbook and Casebook are available from <http://www.wcet.info/projects/tcm/proj-products.asp>
- The TCM / Bridge Project created a cost simulation model to compare the cost of expanding a campus based upon distributed technology versus classroom technology. Details available at <http://www.wcet.info/projects/tcm/bridge.asp>

The "Developing and Applying a Cost-Benefit Model for Assessing TeleLearning" project develops and tests a methodology for measuring the costs and benefits of TeleLearning projects and includes case studies from throughout Canada and work by Tony Bates. (<http://research.cstudies.ubc.ca/nce/index.html>).

How do I get students involved?

For case studies, examples and advice see:

Learning Environments and Pedagogy Case Studies (<http://www.ltsn.ac.uk/genericcentre/index.asp?id=17729>).

Online Tutoring Skills Case Studies (<http://otis.scotcit.ac.uk>).

Higgison, C. ed. (2001). Online Tutoring Skills e-book and case studies. [online]. OTiS. Available from: <http://otis.scotcit.ac.uk/onlinebook/> [17 July 2003] - particularly Chapter 2 – The Tutor’s Role and Chapter 3 – Building an Online Community.

The Students’ Online Learning Experiences (SOLE) Project at the University of Bristol (<http://www.sole.ilt.org/>).

For issues relating to accessibility and to students with a disability see the resources under Accessibility in Section 3.1 and also:

Disability Legislation and its Effect on Information Services in Further and Higher Education. http://www.jisc.ac.uk/legal/index.cfm?name=lis_disability.

LTSN Generic Centre Resources on Disability <http://www.ltsn.ac.uk/genericcentre/index.asp?id=18855>.

TechDis (<http://www.techdis.ac.uk>). For example the TechDis Web Accessibility and Usability Resource can help assess the accessibility and usability of online resources for students with a range of special needs (<http://www.techdis.ac.uk/seven/>).

How can I design effective courses for students?

Find out what courses your institution runs on learning technologies and e-learning. These may include workshops, online courses, self-study materials and accredited modules or programmes on e-learning. For example your institution may run a SEDA (Staff and Educational Development Association) accredited module on Embedding Learning Technologies (http://www.seda.ac.uk/pdf/embedding_learning_technologies.htm).

Further resources include:

Designing an Imaginative Curriculum resources available from the LTSN Generic Centre (<http://www.ltsn.ac.uk/genericcentre/index.asp?id=16893>).

The LTSN Generic Centre resources from a series of four workshops on Supporting Sustainable e-Learning (SSeLF). Themes addressed include: sustainable online course design, sustainable online course implementation, content design and development, and supporting academics through institutional change (<http://www.ltsn.ac.uk/genericcentre/index.asp?id=18429>).

Teaching and Learning Technology Programme (TLTP) and the Fund for the Development of Teaching and Learning Projects (FDTL). The National Project Co-ordination Team has created listed projects based in subject areas at <http://www.ncteam.ac.uk/projects/subjects/index.htm>

The "Effective networked learning in higher education: notes and guidelines" (Goodyear, 2001) available from http://csalt.lancs.ac.uk/jisc/guidelines_final.doc

The TechLearn resource on e-tutoring which include publications, presentations, and resources (<http://www.techlearn.ac.uk/cgi-bin/techspec.pl?l=7>)

Beetham, H. (2002). Understanding e-Learning [online]. York: TechLearn. Available from: <http://www.techlearn.ac.uk/NewDocs/e-learning.doc> [11 August 2003]

Littlejohn, A. (ed). (2003). Reusing Online Resources: a sustainable approach to e-learning. London: Kogan Page. Also available online as a special issue of the Journal of Interactive Media in Education at <http://www-jime.open.ac.uk/2003/1/index.html>. Click on the 'show discussion in same window' icon at the top right hand side of the screen to see the articles and online discussion on the same web page.

You can search for projects that have been funded using the LTSN Generic Centre Project Finder database available from <http://www.ltsn.ac.uk/genericcentre/projectfinder>.

There are many resources available on evaluation including:

The Evaluation of Learning Technology (ELT) project web site (1998-1999) which contains many useful resources and references available at <http://www.unl.ac.uk/tltc/elt/>. The ELT Toolkit is a tutorial exercise to take you through the evaluation process.

The Evaluation Section of the Online Tutoring Book, which contains many references and resources available at <http://otis.scotcit.ac.uk/onlinebook/otis-t5.htm>

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