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A leaflet to assist academic staff in the use of information technology to enhance their teaching

This document presents a series of suggested considerations for academic staff in Higher Education who may want to use information technology (IT) in their teaching. It is intended as a guide to the use of learning technology (LT) materials only: further information is available from LTDI or the other sources listed.

This document should help you to:

- decide whether or not to use IT in your teaching
- assess some of the advantages and disadvantages of using IT in teaching
- identify good CBL materials
- make sure you have considered all hardware and software issues
- identify some of the problems and pitfalls which may occur
- identify some of the main issues which will face your institution
- convince yourself, your colleagues, and your students

So you're thinking about using CBL...

"What do I need to consider before I begin?"

A few challenges facing you and your teaching

- the drive to improve the quality and effectiveness of teaching
- the problems of time, and the balance between research, other activities, and teaching
- the need to increase the attractiveness of courses in the face of 'competition' in the 'market'
- the need to cater for greater numbers of students, from varied backgrounds, and to broaden access (and to offer non-traditional entry methods) to courses, and to support different forms of transfer into HE
- the need to provide more flexible patterns of learning
- the desire to keep up with technological developments - for example e-mail and the Internet
- the expectation of students that you will be ace researcher, top manager and brilliant orator rolled into one

What are the broad aims of the course or module?

- to train students in a range of subject specific techniques
- to enable students to develop practical skills
- to encourage students to participate actively in learning and to fully understand material
- to help students learn and remember a series of facts
- to encourage students to work collaboratively and to discuss and argue issues and cases
- to encourage students' interest and competence in using IT methods

What are your own aims and objectives in considering using IT in your teaching?

- to enhance teaching
- to enable students to learn better or faster
- to save time for research
- to save time for assessment
- to save time for better teaching
- to save other resources
- to cater for more students

What benefits can using technology in teaching bring to me as a lecturer?

- if the CBL is used well, students should react positively towards it
- CBL can help in the flexible delivery of teaching to large numbers of students
- students learn material effectively with potential savings in time
- assessment and other marking duties may be reduced
- communication with students and colleagues may be improved
- there may be less routine enquiries to deal with
- students can become more responsible for their own learning
- some IT resources give access to documents, images, or information which would otherwise be expensive or impossible to obtain
- students can potentially learn at a remote site - or from home
- IT use is encouraged by Teaching Quality Assessment
- using IT in teaching should help you develop your own IT skills

What benefits can CBL deliver to my students?

- they can work anonymously at their own pace
- CBL usually enables them to learn (inter)actively, and encourages them to *do* things, and to become involved in their own learning process
- they usually get instant appropriate feedback
- they usually find CBL interesting, varied and fun
- they can work with real examples and/or practical cases
- they can access a huge range of varied information
- graphics, sound, animation/multimedia offer students a visual and dynamic environment in which to work
- students can explore problems and obtain help in a non-linear fashion, thus encouraging them to investigate and see problems in different ways
- students should be able to understand and solve problems more creatively
- students will learn about IT, and feel they are studying in a positive modern department

What benefits might accrue to the institution as a result of using CBL

- teaching costs (in the long-term) may be reduced
- staff will be able to cater for increasing numbers of students
- improvements will accrue to the institution's image and marketability to students and funders
- improved quality assessment ratings
- flexible use of space and time
- opportunities for development of distance learning programmes
- good CBT fits in well with modularisation

Software types and styles you might consider using...

- drill and practice, where students practice particular activities having been prompted by exercises questions on the computer
- microworlds or games, where students become part of a computer-based 'world' or problem-solving environment simulating reality
- practicals, where the software simulates physical activities which might otherwise be carried out in a practical laboratory, and which might otherwise be expensive or dangerous
- simulations, where the computer attempts to simulate real events and allows students to alter or become part of the real or imaginary situation
- tutorials, where the software leads the student through a series of steps, much as a human tutor might
- analysis or modelling tools, where the computer offers tools for students to build their own analyses or models
- information retrieval, where the software (often on CD-ROM) allows access to a huge range of information
- on-line software, offering access to the Internet and the World Wide Web
- communication tools, where students and staff can communicate effectively using e-mail and conferencing

- presentation software, to enhance your teaching and presentations
- more general assessment or study skills software

Things you should consider about hardware provision

- which platform - Macintosh, PC-compatible, or other - such as UNIX?
- what machines are available in various locations - on your desk, in laboratories/University clusters, students' rooms or halls, lecture theatres, your own department?
- what are the technical capabilities of the machines - how much random access memory (RAM) and hard disk (HD) space do they have; what monitors do they have ((S)VGA?); what peripherals, such as CD-ROM, sound and printers do they have?
- are the machines networked, and how much access to the students have to network software and hardware?
- can the machines be moved, or the layout changed, to suit your own requirements?
- how great is the demand for network facilities, such as printing, and at what cost to the department or students?
- can students gain access to machines for private study if required?
- do you have access to amenable and supportive technical assistance?
- how far ahead do you need to book computer facilities and technical staff?

Other resources you may need...

- academic support from colleagues, research assistants and postgraduate students
- administrative support
- technical support
- equipment and facilities provision
- facilities and personnel for altering (or publishing) CBL materials
- duplication (of disks etc.) facilities
- security arrangements
- an increased budget (to purchase materials in the short-term)

A few initial problems you may encounter

- lack of facilities
- the choice of software may not suit you
- a high workload in the year you adopt the CBL - adapting to new methods and integrating the materials
- you may encounter technical problems
- computer rooms may seem noisy
- students' problems may be repeated at different times as they work at their own pace
- if students become demotivated they may miss crucial sessions
- negative attitudes from colleagues
- organising the CBL activities

Deciding on what CBL you are going to use...

"There's a lot out there, so choose carefully"

A few characteristics of good CBL materials to look for (most packages have a number of these):

- it should be well-designed and presented with a consistent look and feel
- it should be relatively quick to learn and easy to use
- the software should be navigable - users should never feel 'lost' when using it
- the software should be tailorable - easily if so advertised
- the software should make best use of the computer's strengths - calculations, graphics and interactions - and not carry too much text
- the software should be easy to set up
- the software should carry relevant and usable help facilities
- the software should be accompanied by relevant and usable documentation

Where can I obtain software from?

- Teaching and Learning Technology (TLTP) projects
- commercial sources
- public domain sources
- Information Technology Training Initiative ITTI
- sources within your institution or various private individuals
- DIY

Where can I obtain advice on using and implementing CBL?

- your institution's IT Officer, Teaching and Learning Service, Computer Services or Staff Development Service
- the 22 Computers in Teaching Initiative (CTI) Centres
- the Computers in Teaching Initiative Support Service (CTISS)
- the Learning Technology Dissemination Initiative (LTDI)
- the TLTP projects
- the TLTP regional centres
- Various World Wide Web (WWW) sites

Types of integration of software into courses

- use the CBL materials in a laboratory or computer room (either supervised or unsupervised) as a tutorial substitute
- use the CBL materials in a laboratory or computer room (either supervised or unsupervised) as a (partial or complete) lecture substitute
- use the CBL materials to substitute for practical work

- encourage students to make use of CBL in their own time - self-study access for remedial help or revision
- use CBL as a tool/forum to prompt discussion in seminars
- use CBL as a (information) resource for group or project work
- use CBL as an analytical or diagnostic tool
- use CBL primarily for assessment
- use parts of CBL materials for demonstrations in lectures
- use CBL as a running game or simulation over several weeks or modules

Some broad issues of course re-design to consider

- full integration of CBL into the course is vital
- know and plan for the genuine level of computer literacy of your students
- test the materials on a small group of students in the first year
- prepare dedicated handouts or worksheets to encourage CBL usage
- add computer references to reading lists
- is what you are planning pedagogically desirable, and planned into the rest of the curriculum?

A few practical aspects to consider

- try the software on the machines to be used with students, not just the one on your desk
- be prepared for problems to occur
- is what you are planning technically feasible?
- try to obtain some departmental control over CBL facilities

A few initial assumptions to avoid

- that colleagues will share your enthusiasm - but do offer to share your experiences with them
- that students in the computer game era are computer literate and confident
- that your colleagues are computer literate and keen
- that CBL will be used because it is there - it must be properly planned into the course
- that CBL will replace you or lectures - it cannot

Practical Issues of Implementation

"What do I actually do?..."

Discuss with others in the institution

- course leaders or your Head of Department
- staff development officers
- Teaching and Learning co-ordinator or IT subcommittee
- LTDI contacts
- TLTP contacts or consortium members

Investigate hardware and space

- technical facilities
- numbers of students
- availability and scheduling of space
- availability and numbers of machines
- availability of spare machines

Re-design parts of the course

- discuss with students
- discuss with colleagues
- discuss with course committees and validation bodies
- amend the software
- prepare worksheets and other accompanying materials
- test worksheets and accompanying materials
- arrange for team teaching or demonstrators

Selling the idea to students

- when first running the software, tell them they are part of a trial group and request feedback - then listen to it and act on it
- offer an introductory session for those with no previous IT experience, or offer them full details of any centrally-run courses
- tell the students they will gain from using computers and offer them clear aims
- tie the computer sessions closely to the lectures
- assess the materials delivered by the computer (either by machine or with subsequent exercises)
- only include relevant computer materials
- tell them how, where and when they get can get help with using the materials
- tell them it is a new, exciting and dynamic way to learn
- get them involved in more general ways - for example by setting up e-mail discussion lists for the module group and encouraging them to contribute

Some of the most common student attitudes to prepare for...

- I don't like computers
- I don't know how to use a computer
- I know all about computers - so I'll press this key combination (whoops!) (or just play games)
- I've done this before
- this is fun - much better than lectures
- this is not real work - it just lets staff off lecturing - it is not difficult and it is not important
- it is too difficult - struggling with the computer and the material
- we won't have this computer package in the real world - we cannot take it away with us like we can a textbook (for future reference)
- we can't get into the labs - they are fully booked and not open at weekends or in the evenings
- sorry - I couldn't do the assignment because the computer crashed just as I was going to save my work
- backups - what are they?

A few staff attitudes you may encounter

- computing is not our area - we are teachers of ...
- we should be teaching them DOS and UNIX - this is not real computing (correct)
- computing is the preserve of technical staff - I'm a lecturer
- how do you know which student does the work
- what is wrong with the way we have taught this course in the past?
- does it really save time and other resources?
- it is a very impersonal way of learning
- what would I do if the machines went wrong?

Concluding Issues

"A few words of wisdom and encouragement..."

- know your students - make sure the CBL system is what they need
- know the software - well
- be enthusiastic
- be the facilitator
- provide encouragement
- learn when to intervene
- set targets and deadlines
- be led by the teaching, not the technology
- evaluate thoroughly
- focus on disciplines
- attend to standards
- reflect and adapt
- know where to get help
- be confident and flexible - and **enjoy IT!**

Further Information is available from:
LTDI, ICBL, Heriot Watt University EDINBURGH EH14 4AS
Phone: 0131 451 3280 FAX 0131 451 3283 WWW: <http://www.icbl.hw.ac.uk/ldti>