

5: So you are thinking about using Learning Technology

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This chapter is to help you think about a few of the issues that should be considered while you are deciding whether or not learning technology is for you. Questions will be posed throughout the chapter, some of which may not be welcome, but which can introduce some helpful angles from which to think about your teaching.

What are your aims?

No new courses will be truly successful unless they have been properly planned. Lectures which are carefully prepared and tailored to both the course and the students are much more effective than those which are only sketchily thought out beforehand. This statement is especially valid for the use of technology when many other variables interact with and confound the educational environment.

Following best educational practice the starting point must be the aims and objectives for the introduction of technology. Why exactly are you thinking about using learning technology as part of your teaching? There are many possible motivations, or more often a combination of motivations, and any or all of them can be very laudable.

The ever changing environment as your motivation to use LT

Universities in the 1990s are very dynamic environments with an increasing emphasis on efficiency and financial accountability. Many staff find courses changing to fit in with new university structures or delivery methods, and increasing competition for shared resources such as laboratories and teaching rooms. Can technology offer one method of addressing some of these issues?

“We just can’t spare the time to reteach the basics that the students should have learned at school.”

It would be most unusual for all students to begin courses with equivalent background knowledge. Some students have a very weak grounding in material that is an essential foundation for their degree, yet it cannot be justified to recap this material within their University course.

Possible LT solution - Offer an initial diagnostic assessment test, (perhaps between confirmation of the place and matriculation, or in the first week of the course?) to establish the basic level of understanding for each individual student. In many cases this could be a multiple choice test, delivered and marked automatically, to identify individual weaknesses. There is little reason why the same test could not be used for several years, reducing the added workload for staff. Direct students to a bank of self study resources (texts, videos, CAL packages, ...whatever is appropriate). Offer a special support tutorial, (perhaps in a computer lab) where these students can seek extra support from staff and amongst themselves. Many CAL packages offer detailed tutorial instruction and self assessment questions to help students consolidate their knowledge. Monitor the progress of these students and offer them a further formative test to establish whether any (or hopefully that an) improvement has taken place.

“Our class sizes are constantly increasing; I need another way of handling tutorials.”

In large tutorial groups some students are reluctant to speak out, or to participate in the discussions. Perhaps they absent themselves from the classes.

Possible LT Solution - Provided it is possible to get access to a suitable room, a computerised lab can be run any number of times, to allow each student to get equal opportunities to access the materials. Run traditional tutorials every fortnight for half the class, and set the other half a lab session using CAL materials, demonstrators can be used to provide extra guidance.

“I would like to encourage the students to feel free to come to my room to seek help, but more and more that is meaning that I can hardly get on with my research”

Do groups of students often ask the same question as each other? Are there likely to be other students who are wondering the same thing but never felt able to ask? Are a lot of enquiries to do with routine or administrative issues?

Possible LT Solutions - Set up an e-mail group for all the students in the class. Encourage students to ask questions electronically rather than by calling at your office, then you can deal with the questions when it suits you. Post questions and answers to the list (omit student names, perhaps). Encourage students to respond to questions from their peers (but monitor the responses, to correct any factual errors). Make last year's questions and answers available for browsing. Make copies of lecture schedules (or lecture slides & notes) and information about supporting resources available so that students who know they must miss a lecture can try to catch up. Use e-mail to remind students about assignments and completion dates so that missing a lecture does not constitute a ready excuse.

LT Enhancing the student experience as your motivation to use

Student learning styles vary enormously. Not all students respond positively to the same teaching techniques. Not all students respond positively to the teaching techniques that we respond to when we are learning. Does your teaching style match the preferred learning strategies of your students? If not, could you change it? Do you know about the preferred learning styles of your students?

Used well, learning technology can help turn the learning environment into a highly interactive, stimulating world where the student is totally embedded in the learning process. Learning technology can offer students control over their learning, and flexibility, so that they can learn in the style that for each individual is the most effective. The ideal package will offer both a highly structured route of study for some students, or the opportunity to explore topics in any sequence which is practical for the subject being studied.

“I explain it my way, then we use the computer. Some students understand me, and the computer reinforces the concepts; other students find the computer helps sort out what I was talking about in the lecture.”

Possible ways to integrate LT into your teaching -

Use LT as an illustration/demonstration within lectures - use the computer to demonstrate a particular process. This is especially useful for processes which are naturally very slow or very fast, for viewing processes from a different perspective. Use of LT can save lots of hand-waving in explanations, or the construction of awkward diagrams covered in coloured arrows - and it makes things much clearer for the students!

Use LT as an illustration/demonstration within tutorials - Additionally, using a demonstration within tutorials can allow students the opportunity to run the example several times, perhaps with the lecturer directing the students to record, or otherwise investigate, particular features of the process.

Use LT to simulate a business environment - There are a number of business 'games' available which can model a real environment. Students can role play different responsibilities within a company, and can experience conflicting interests and arbitration processes. Encourages active learning by experience and participation, rather than by absorption from the lecturer's experience.

Direct students to use LT as a self study resource following lectures - A tutorial package can allow students to work through complicated ideas at their own pace, if necessary working through some sections more than once. Most packages include self assessment questions and feedback designed to support the student and provide a clear indication of progress and understanding.

“Often lectures can be rather dull. I've never seen a student fall asleep in computer labs, and they definitely ask far more questions”

Possible ways to integrate LT into your teaching -

Use LT as a lecture substitute - particularly for introductory materials, or for straightforward content, a computer may be a very satisfactory delivery tool, leaving the contact time with the lecturer to be used to concentrate on explaining difficult ideas, or the promotion of discussion.

Use LT as an analytic tool - Involve the student in the process of learning. Rather than telling them what happens in certain situations allow the students to discover for themselves.

Use LT to prompt discussion in seminars - Use the computer to work through a number of different scenarios to highlight differences of opinion, or surprise results. Use the computer as a tool to record opinions from a group on an issue where they may be reluctant to record views more openly. Use the computer to compare individual revisions made to a document by a group of students.

Use LT as a resource for project work - there are many databases and other programmes full of information on a complete range of academic subject areas. Students can access the information easily, and the information need not be restricted to text or images; video and sound files are increasingly included in multimedia packages.

Encourage the students to use LT as a presentation tool - involve the students in using the technology and creating effective and professional presentations, such as producing OHP slides from WP or graphics packages, desk top publishing publicity materials (perhaps in colour, if facilities permit), or using full computer presentation packages. Such skills are increasingly sought by employers, and most students find it satisfying to produce a high quality product, often investing a great deal of effort in the process.

“Even a lot of full time students are now working, so sometimes it’s difficult to arrange for times to get together. CAL packages offer tutorial support at times that suit the student; and they are always available for revision.”

Possible ways to integrate LT into your teaching -

Direct students to use LT as a self study resource to prepare for lectures - Have a lecture schedule detailed well in advance, so that students know what is to be delivered in each class. Tell students that the class will assume that they know about a certain topic, and that a quick revision of that is available from a specified source. Make sure that the students know that you really do expect them to use these materials - don’t go over them in class, except to sort out any problems.

Direct students to use LT as a revision resource - Computer based materials can deliver course material, supported by explanations and interactive demonstrations, where appropriate. Many students appreciate the inclusion of self assessment questions to give them some guidance as to their progress. Prior to examinations it is possible to provide practice questions and solutions for students. Many students like to study during ‘antisocial’ hours, and wherever possible access to computers should be arranged to take account of this. Use a diagnostic test to identify areas of weakness for individual students, and follow this up with tutorial materials (not necessarily just computer based) specifically identified to address those areas of need.

Use LT as a communication tool - Use e-mail to pass on administrative details to your students. Set up electronic seminars, rather than traditional group gatherings. Each student in turn submits a paper, by e-mail to the group, and then other students submit comments on that paper, with an electronic discussion following (it may be necessary for staff to act as a catalyst for this process). After a couple of weeks, the original student resubmits the presentation, including a summary of the discussion.

Use LT to give students immediate feedback on their understanding - computers give immediate feedback on interactions, whether these are presented as part of the navigation and selection process in the package, or as summative questions to check on progress. Well designed packages offer individualised feedback appropriate for the action that stimulated it, rather than a bland message designed for all occasions. Feedback from students indicates that self assessment questions are a very popular part of most computer based learning packages.

“It seems wasteful for me to spend my time teaching straightforward ideas, that the students grasp immediately. If I deliver the straight forward material using a computer, then it means that my direct contact with the students can be spent exploring the difficult ideas, and trying to sort out their misconceptions.”

Possible ways to integrate LT into your teaching -

Use LT as a tutorial substitute - particularly for the delivery of materials that students usually have little trouble assimilating, or have studied previously. Students can elect to work through these materials alone, at a time which is convenient to them; or together in groups with a lecturer or other demonstrator present. In this situation the lecturer can develop and expand on the ideas introduced, and clarify any confusion or misunderstanding that arises. It may be necessary to provide printed support materials, so that students can record results, or to provide them with a written reminder of the tutorial.

Use LT as a diagnostic tool - Use of a properly designed and tested diagnostic aid can help in identifying those areas of the syllabus that students already understand well, and those where there is a need for more explanation. This additionally enables the lecturer to identify any sections of the course that there is no practical need to teach at length because it is already well understood. The class may show a fairly consistent profile, or individual needs may differ greatly, but this can be readily established with a diagnostic test, and appropriate action then taken, the provision of individual programmes of study.

“I haven’t got the resources to let the students try all the experiments that I would like to, so we have included a few simulations this year. They let the students experience the process of the extra experiments without stretching departmental resources, and the students seemed to like them.”

Possible ways to integrate LT into your teaching -

Use LT to substitute for practical work - Some experimental situations may lend themselves to the use of simulations. A computer workstation can be used amongst a series of ‘wet’ laboratory stations, perhaps releasing equipment for other purposes, or relieving a difficult classroom management situation. Groups of students can work together, or students can be directed to work through materials alone. Computer based practicals can easily be made available for students to use again after the principal use, for revision or consolidation purposes.

Use LT as a simulation for experimental situations - Computers are particularly useful in the exploration of situations which are dangerous or otherwise difficult to recreate in a normal laboratory or classroom situation. Simulated experiments can facilitate the students’ experimentation with parameters and variables which would normally require close supervision, and results can be automatically recorded if desirable.

Skills training as your motivation to use LT

Most employers reasonably expect that new graduates have a working knowledge of computers and their role in a modern working environment. Some jobs demand a thorough knowledge of particular types of package, others require a general level of computer literacy. The computer can also be used as a tool to develop skills of collaborative working, or equally to encourage students to take more responsibility for their own learning. Perhaps you, as a member of staff, are keen to develop your own skills in the use of and management of technology.

Encouraging students to work collaboratively can have the added benefit that students will ask each other questions that they do not feel able to ask you - and explaining things to each other is a great way for students to discover what they understand and what they just think they understand.

“Databases are fundamental to the job these days. Students must be fluent in their creation, applications and management.”

Possible uses of LT -

Teach the students to use a specific package - word processors, spreadsheets and databases are all standard tools. The skills required to use any one package are very closely matched by those required for alternative packages, and are therefore highly transferable.

Use LT as a presentation tool. Teaching materials created and stored electronically can easily be accessed, updated, and tailored to individual course variations. Materials prepared electronically typically look fresher and give a more professional impression to students, and colleagues. Unless staff are seen to be making full and effective use of the available technology, students cannot be expected to do so.

“No one ever really makes backups until they have lost something that was important to them. Students have to be encouraged to use computers on a day to day basis to really learn about the reality of the electronic age.”

Possible uses of LT -

Insist that all assignments are produced with appropriate tools. Emphasise the importance of presentation for a professional approach. Spell checkers mean that all text should now be free of spelling errors. Encourage the use of charting packages or desk top publishing as appropriate, but considering the practical problems of student access to equipment. Make the students get to grips with using the computer as a day to day tool. Let them learn how to refill the paper, and change print cartridges. Help them to become familiar with the advantages of using sensible file names, and to label and date discs - the only successful way to really learn these things is through personal experience.

“More and more team working is an important skill. The computer can be the focus for a group activity, and thus the catalyst for the development of effective group skills.”

Possible uses of LT -

Encourage students to support each other and help sort out minor technical hitches. Sometimes students are more willing to, or find it more convenient to seek assistance from their peers. For students from whom help is requested, the process of formulating a clear explanation can help identify any areas of confusion that perhaps they would otherwise have remained unaware of.

Business simulations are a fun way to model a commercial environment, and actively promote consideration of the kinds of interactions that exist in most workplaces. An element of competition can be introduced between different groups to increase motivation.

“A lot of our students have access to computers away from the campus. We have been setting assignments that depend on material delivered by computer but the students choose when and how they complete the task. It makes them much more responsible for their own learning.”

Possible uses of LT -

Use e-mail to administer your courses. Remind students of assignment deadlines a couple of days before they arise. Circulate information about room changes to all students, regardless of the campus or building in which they are usually based. Distribute assignments electronically, and ask for them to be submitted by e-mail - identifying each assignment with a date and time of submission.

Use LT to train the students in a particular skill. In some subject areas, (e.g. psychology) students are required to record observations, typically behaviours, as they occur. Use of computer simulations can give the students practice, and can immediately compare their recorded observations with the true pattern, until the desired degree of accuracy is achieved. Students can practice for as long as is necessary. A familiar, but basic example of this idea is a typing tutor, which records accuracy and typing speed, but there are now many more sophisticated applications of the same idea, some of them in very specialised applications areas.

Other types of motivation for your use of LT

Teaching Quality Assessment exercises are now familiar, and can be a factor in encouraging departments to consider the possibilities of learning technology more seriously. It is a potential danger with an assessment looming that the introduction is less thoroughly planned than it would be in an ideal world, and if this in turn leads to a few slightly (or highly) negative reactions then problems may be hard to shake off - first impressions still tend to stick.

“Students like practical classes; every year their feedback forms ask for more practicals.”

Feedback from students for courses where technology is highly integrated and embedded into the course indicate that it is generally popular with students. Use of technology can add a modern feel to an otherwise old-fashioned course.

“It’ll give me more time to”

The introduction of technology may allow you restructure your use of contact time with students or it may redistribute the times in the session when you feel under greatest pressure, but staff, or institutions, who view technology as the wonder tool to release major tracts of time, previously used for teaching are likely to be disappointed.

Technology can be a wonderful supplement to a course. It should not be expected to be the answer to every situation. Sometimes a non technological solution may even be better!

What are the course aims?

Is the course that you are delivering really matching the documented aims? For every lecture and tutorial can you identify which aim is being addressed? Which parts of the course do students struggle with? Are those parts essential to meeting the course aims? If not, why are they included?

Planning the introduction of technology is a long process. By all means tell the students that the package is loaded on the machine cluster in lab B3, but they will never use it. Any learning technology **MUST** be fully embedded and integrated with the wider course.

Does the content of the technology closely match with the aims of the course? If not, can it be tailored to do so? (Or should the course be revised ?) Does the technology promote an appropriate depth of learning ?

Many packages are designed to be tailored by an individual institution or an individual member of staff. Any one with a standard familiarity with computers should be able to change the examples in these packages, so that they refer to the local area or the appropriate context for each class. Don't rule out a package because there are one or two features that you don't like, if you think that the overall approach matches with your course and your objectives then it may well be possible to tailor it into a perfect fit.

What does technology offer that other resources do not?

What is the introduction of technology going to add to the course?

You must be able to answer this question, otherwise you should question the merit of going ahead with the introduction of a new item of Learning Technology.

There are lots of possible answers, these are just a few :

"The students can each work at their own pace"

"Students can use the computers at a time that suits them"

"The computer allows experimentation so the students can try things out"

" IT can demonstrate effects that are normally too hard to see"

Additionally technology assists in the motivation of students, particularly by involving them interactively in the learning process - see chapter 9.

What extra benefits can be anticipated?

What are your own aims for introducing the technology? Looking back through the earlier sections in this chapter how many other aims would be of interest to you and your students?

And the down side....

There are important words of caution. Practical issues to do with implementation are discussed in more detail in chapters 8 and 4, so just a few points are made here. Perhaps some of the most important issues can be listed as:

High initial effort required to plan implementations

Provision of adequate resources and access to computers

Technical Support for students (especially out of regular hours)

Updating of software

Attitudes - of colleagues and students

So how do I actually get started?

Planning an implementation is not a quick job. There is an initial enormous demand on your time, but a well planned implementation can repay it all eventually. Allow far more time than you can ever imagine needing.

Start with your course, and look at the aims and objectives.

Identify parts of the course that would be enhanced with the use of technology.

Identify items of technology that will satisfy these needs.

Check whether the technology can be supported in your institution - this includes things like whether it will run at a satisfactory speed across a network if all your students are using it together.

Check whether it is necessary to approach course boards or validating bodies before making changes to the course, or to the teaching methods employed.

Check whether the technology is likely to be appropriate for the skills of your students.

Identify what role the technology is playing in the course. Plan any supporting documentation or other support materials that will be required.

Identify how the students can get help with the technology, when they need it.

Plan any tailoring of software that is required.

Why will the students be motivated to use the technology? Plan any introductory sessions.

Pilot the use of technology with a small group of students and replan your implementation in light of the feedback.

Plan an evaluation of the implementation.

Enjoy it.