6: Using learning technology to support student study skills

Jen Harvey & Helen Watt

Introduction

Over the last decade there have been many changes made within the Higher Education System, for example, the creation of new universities, the growth in the number of students gaining a university place and the increased availability of learning technologies. These changes, in combination with various internally and externally directed academic audits and quality assessment exercises, have resulted in many academic staff re-evaluating the instructional methods utilised within their courses and how these relate to the quality of their students' learning. High unemployment has also resulted in many perspective employers being able to redefine the range of skills, such as good communication and team working skills, which should now accompany the body of knowledge required from a university graduate.

As a consequence, universities are now tending to provide a broader range of instructional methods but at the same time students are also expected to undertake more independent learning. Many students starting university do not always possess the pre-requisite skills to cope with the challenge of the new and changing learning environment. An environment where they are expected to study without being told specifically what or when to study. Ultimately, their success or failure within university courses can be determined by their ability to adopt the most appropriate strategy within a particular learning situation. This might, for example involve working within a group to prepare an oral presentation on a given subject or studying for a multiple choice question test. Each requires a different set of skills. With many courses having their intended outcomes as being the development of higher level cognitive skills, such as the ability to think creatively or to be able to analyse or synthesise new information etc. course designers are now considering ways in which students can be encouraged to adopt a more active approach to their learning in order to undertake learning of a higher quality. This can involve not only considering the way in which the course is designed but also the level of study skills support provided for the students.

Quality in learning

There has been a considerable amount of research work carried out to investigate the impact of students' approaches to learning (eg. Pask, 1976; Ford, 1985; Nisbet and Shucksmith, 1988; Laurillard, 1988;) At the most fundamental level, researchers have described student approaches as being within two different categories, both of which relate to a student's intent to learn. The first can be considered to be a 'transformational' approach when the student sets out to understand any new material which they then actively relate to their previous knowledge and experience. The second approach is considered to be a 'reproductive' approach. Here the student does not make the effort to understand any new material and they simply comply with course requirements in a fairly routine way. This results in information remaining disjointed, unrelated and if necessity arises, subsequently being passively reproduced.

The most frequently cited descriptions of these two approaches in the literature are the 'deep' and 'surface' approaches as identified and described by Marton and Saljo (1976 a and b) but there are similar distinctions (of intent to understand) in the 'comprehension' and 'operation' approaches described by Pask (1976) and the 'holistic' and 'atomistic' approaches described by Svensson(1976). There is evidence that when each of these approaches is used exclusively, different types of learning occur (Marton and Saljo, 1976; Pask, 1976; Biggs, 1979). Research into the consistency of these approaches has produced contradictory results. However, it has been shown that students will generally adopt reproductive approaches to their learning if an instructional method is perceived as being threatening, uninteresting, irrelevant or if their workload is perceived as being too high or they are unsure of what is expected of them, for example in an assessment procedure (Ramsden, 1984; Saljo, 1982; Entwistle et al., 1989).

Several investigators have also recognised what is described as a strategic approach adopted by some students. This approach is not so much related to a students intentions to learn the material but to the way in which they

feel motivated to work the educational system either because they wish to obtain success at university or they have a fear of failure (Miller and Partlett, 1974, Biggs, 1982)

There are several questionnaires available to measure learning strategies, the best known of which are Entwistle and his colleagues' 'Lancaster Approaches to Studying' (Entwistle & Ramsden, 1983 and Entwistle & Tait, 1992) and Biggs' 'Study Process Questionnaire' (Biggs, 1987). These can be used to help to identify students who might be 'at risk' and might require some additional support in adapting to life at University.

Why offer advice about studying?

The following extract from Appendix A of the Report of a Working Party of the Committee of Scottish University Principals entitled Teaching and Learning in an Expanding Higher Education System clearly addresses this question.

> "Skill in learning and studying*: If there is to be increased emphasis on independent learning in higher education, it is essential that students are carefully prepared for that independence. Students are currently dissatisfied with the help provided by higher education institutions in preparing them for the study skills they need (Wall* et al*, 1991). Many students seem to be unsure how to handle the amount of freedom they are given in higher education, and even how to take lecture notes or to research and write academic essays. Many institutions provide a brief initial introduction to study skills, but it is unusual for them to provide subsequent systematic advice and support. Lack of study skills support has been identified as one of the reasons for drop-out or academic failure (Biggs, 1987; Meyer, 1992). Thus, improvements in the cost-effectiveness of higher education depend, in part, on ensuring that students develop adequate skill in learning and studying. There is accumulating evidence that early failure can, to some extent, be avoided by early identification of students 'at risk'. Questionnaires have been designed to indicate the extent to which students are following effective study strategies. Students identified as 'at risk' can then be offered advice and remedial support in study skills (Entwistle* et al*, 1992)." (CSUP, 1992).*

Appendix A of the quoted report above reviews the extensive literature on student learning and teaching in higher education, therefore it will not be duplicated here. This taken together with the series of self-instructional materials "Effective Learning and Teaching in Higher Education" produced by the CVCP Universities' Staff Development and Training Unit in 1992 and the examples of both traditional and innovative good practice found in "Guidelines for Promoting Effective Learning in Higher Education" (Entwistle et al. 1992) can provide some background reading on this research.

Learning Technology and developing study skills

Improving study skills is an area which everyone agrees is important. Unfortunately, because this type of training often is not the responsibility of a particular individual, module or department, training in these essential skills can sometimes be neglected. In a crowded timetable course organisers are often reluctant to transfer contact time from subject specific content to more generic material such as study skills. It is not surprising, therefore, that a number of resources including several LT materials are now available which enable students to spend as much time as is necessary for them to acquire the necessary skills without impinging too heavily on staff-student contact time. In some institutions, information on study skills is included in induction training or in freshers' week.

Some of the best computer-based packages which provide tips and techniques for students to improve their study skills were developed under Phase 1 of the Teaching and Learning Technology Programme. In particular:

- Teaching with Independent Learning Technologies (TILT) (Project 1) which has developed a number of hypertext Information Skills modules and a Study Skills module aimed mainly at first and second year students;
- Identifying and advising students at risk from deficient study skills; a computer-based package for departments (Project 8). PASS: Personalised Advice on Study Skills containing three pieces of software: Questionnaire, StudentView and StudyAdvisor;
- Courseware for Learning and Study Skills (CLASS) (Project 10) which has open access modules, focusing on the acquisition and practice of generic learning and study skills;
- Technology based learning in medicine; beyond courseware (Project 31) which aims to promote the incremental development of a transportable technology based system of learning in medicine.

Further information on these and other packages are available in the LTDI Information Directory.

Thinking about study skills training

Although there are an increasing number of CAL packages, and other LT materials, available which can be used to smooth students' transition both into and through their time at university, it is still important for these materials to be integrated into courses rather than just being made available should students wish to obtain advice or assistance. Often, study skills such as time management and examination skills are timetabled in sessions during an induction or freshers' week when students might be referred to booklets or LT materials available on departmental or university networks which will be available to students at other times during their period of study. Holding an event such as this at the beginning of the academic year may not be the most effective time as students may not appreciate the relevance and importance of the advise on offer. During these first few days in higher education it is perhaps difficult for students to imagine what it might feel like, for example, taking notes from a lecture or to have the pressures of meeting several assignment deadlines. Further revision or exam techniques will only become uppermost in students' minds as they are approaching their first class test.

Lecturers and class tutors can assist students by integrating relevant parts of the study skills materials at various stages throughout the session. Students should be introduced to the material available in packages and provided with the necessary information on how to access them. For example, when students are given an essay assignment they could be directed towards study skills materials on essay writing. Thus students can refer to the various sections included in the package as and when required. Students are more likely to be motivated to use the facilities when the relevance of the content has been highlighted by integrating references to the available material in everyday course work.

Targeting the students who need help

If the option of whether or not to use a package is left to students it is often the more conscientious individuals that are the ones who make use of it. Students who are having difficulties will often select to write up notes or revise subjects they are having difficulty with rather than spend the time working through LT materials on how they might improve their examination skills. Unfortunately, deliberately targeting or identifying only some students at risk can attach a stigma to obtaining advice and study skills becomes perceived as only being necessary if you are falling behind or not coping with your course. Timetabling in a one or two hour slot per week for study skills training also has its disadvantages in that study skills become almost compartmentalised with some students failing to see the practical application to the rest of the course.

If study skills training is integrated into the subject based modules this can help to alleviate many of these problems. For example, running a session on how to make a student group more effective in association with setting a group based project can lead to students beginning to think of study skills development as being as much a part of the course as undertaking the course assessments. Make the training an enjoyable experience, involving the whole of the class and students are likely to feel more motivated to think about how they might adopt a deeper approach to their learning by improving a broad range of study skills.

Timing and assessment implications

Another important consideration when planning to integrate study skills teaching into courses is to time the integration phase appropriately. Too early and the training will not seem relevant - too late and most of the material will appear redundant. Integrating the use of Learning Technology and CAL study skills materials into courses also means that examples of good study skills should be rewarded academically in some way within course assessments. Therefore, if you are trying to encourage students to improve their group skills marks should be allocated for this, usually through some kind of peer group marking scheme, in addition to that awarded to the subject content.

Some ideas for integration

The following section provides some suggestions of ways in which Learning Technology can be used to introduce specific study skills more effectively into courses.

Involving students in student induction

Encouraging an active student participation in developing study skills can be a productive way of helping students to take responsibility for their own and to assist in other students' study skills development. For example, new students can be adopted or mentored by students further on in the course. This can also be a useful contribution towards the induction process for students starting university. If group 'mentoring' sessions are supported departmentally by being timetabled into courses then this will increase their perceived usefulness and importance. If a formal adoption or involvement is to be made by other students then perhaps some kind of incentive could be used to encourage the student's participation. This could be some kind of monetary reward or involve a formal academic accreditation as used in various Supplementary Instruction projects.

Some other ideas for student involvement could include :

- Give second and third year students the responsibility of providing information to new students about, for example, computing facilities in order to introduce a different perspective to that of academic staff.
- Involve students in writing a beginners guide for new students about finding your way about the World Wide Web.
- A list of Frequently Asked Questions posed by new students could be set up on a University computer network which relate to different study skills and these could be answered by both staff and other students.
- Computer based help line or e-mail discussion group could be set up for new students.
- Video clips of different scenarios which new students might encounter during their first weeks eg tutorial, lectures etc could be stored in association with files or pieces of CAL software providing advice in, for example, note taking
- Student teams could be set up to function as study groups to provide mutual support for each other through the first year. Study groups could be maintained in subsequent years via e-mail or using conferencing software like First Class. Setting up student teams can also provide the opportunity to reflect and work together as a group if, for example, students are encouraged to submit reflective diaries.

Note taking

Faced with the large quantity of information covered within a lecture, some students can have problems in taking notes from lectures either because they have difficulty in recognising key points or they are preoccupied with trying to write down everything said. Referring students to LT materials which provide advice in taking notes eg PASS is more useful when supported by the member of staff making it clear which are the most important points from their first lectures. Using management tools (for example the computer based Pharmacology Integrated Learning System which provide the software to present lecture notes, links to LT materials and assessments) can allow staff to provide their students with a basic framework of information about their lecture course and also encouragement to look for links between different parts of a subject. In addition :

- Students could practice taking notes from a video of a lecture and make comparisons between their own and others notes and use this to provide a trigger for discussion.
- Student support teams could be encouraged to share their notes
- Students could be encouraged to think of ways in which they might rewrite their notes making use of various learning tools such as concept mapping software or developing a multi media package with links to relevant WWW pages
- If the lecturers own notes are made available on the departmental fileserver, then students could compare their own notes with that of the lecturer and score themselves according to the number of main points which they have identified. These could then be compared with the rest of the class' scores.

Groups

LT materials which encourage students to reflect on their group dynamics can be used as part of an introductory session when setting up student study groups. This could be followed by students being asked to reflect on their groups activities or to keep a diary of their work on a particular project. Proposed group plans or a synopsis of

the plans or reflective diaries could then be submitted electronically to the lecturer and comprise part of the project assessment.

Some other ideas for group based study skills activities might be :

- Student groups could work through the PASS Study Advisor and compare their responses within their group. Possible solutions as to how students might solve some of their problem areas could be used as a trigger for a class discussion.
- A group game over a sequence of weeks relating to study skills could help to share their experiences. This could be computer based with regular feedback sessions to the rest of the class.
- Groups of students could be asked to construct a concept map of a particular subject area using the CLASS auto-monitoring software and comparisons made between each of the groups different concepts maps, including the ways in which they have linked up ideas.
- Groups of students could review different pieces of software and report back to the class. For example they could pick out one of the CLASS study skills modules and carry out some of the recommended exercises and report back on their effectiveness.

Examination skills

The CLASS, PASS & TILT packages provide useful information on examination skills however, providing students with practice assessment material can be a useful way of applying these skills within a non threatening environment. Providing students with feedback on their performance through such methods can be a useful way of assisting in the learning process.

Different pieces of software are available which can be used to provide students with a range of different types of assessment (see Chapter 10) and these can also be used to provide students with constructive feedback on what constitutes good or bad answers or how to go about answering particular types of questions. Students could also be encouraged to devise their own questions to add to a database or to contribute to an ongoing discussion via e-mail.

Writing skills

Although general advice can be given to students via LT materials as to writing essays or laboratory reports, individual staff often have individual preferences as to the presentation of materials and the way in which they mark assignments. Again this reinforces the idea of providing students with guidelines as to what will constitute a high or low scoring assignment for their particular subject. Using LT material as a foundation, a lecturer could point out the good and bad points within anonymous examples of previous students' work, possibly from work stored within a departmental computer based resource collection. Added comments or notations within a piece of word processed work can provide constructive advice to a student as to why, for example, they have consistently obtained a low mark for their own assignments.

Some other ideas for developing writing skills :

- Ask students to write out a set of instructions, for example, relating to carrying out computer simulation, and ask another student or a group of students to follow them through and to make comments.
- Involve students in developing a computer based scoring grid for use when marking essays and then ask them to use it to mark another student's essay or to self assess their work . Involving students in deciding the weight between different scoring criteria can be a useful trigger for discussion with a class which has just been set a course assignment.
- A selection of computer based material from various publications could be made available for students and form the basis of a quiz when students could be asked to identify the source of a piece of text and to justify their decision.
- Students could be asked to write a paragraph about a specific subject area in a particular given style eg for a tabloid journal, a woman's magazine or a learned journal and the rest of the class could be asked to guess the intended audience.

Retrieving Information

Students are now able to obtain information from a variety of sources. The World Wide Web provides access to, for example, academic libraries, multi- media databases and discussion groups from which individuals can obtain a range of up to date information for use in their course work assignments. However, instruction in methods of carrying out effective information searches is important if students are going to move away from using just their lecture notes or perhaps only one course book as their main sources of reference. LT materials which provide outlines of efficient ways of carrying out literature searches such as the TILT software can be used more effectively if used in conjunction with face to face sessions involving the subject based librarians and at an appropriate stage of the course. This helps not only to identify the relevant person from whom a student might seek assistance in the future, but also helps students to relate the information to their own particular institutional environment.

Some other ideas to encourage students to make use of computer based information retrieval systems might be:

- Students can be directed to the World Wide Web as a source of information. Ask the students to recommend useful URLs and use these to build up a departmental Resource base for future students' reference.
- Setting a collaborate project where a group has to give a presentation to the rest of the class about a topical subject but each group member researches only one specified part of the topic. The group work is then dependant on each of the student's contributions.
- Ask first year student groups to retrieve information from the library about a topic and to present their finding on a poster which could then be assessed by the rest of the class
- Students could be asked to prepare an assignment which uses only the World Wide Web as a source of information and has to cite the URLs used in their reference list.

Conclusion

If students are to be expected to be motivated to undertake an active and meaningful approach to their learning then they should be provided with both an appropriate environment and adequate support . Much attention has been focused on which teaching and assessment methods would encourage a deeper approach to learning. However, Entwistle et al. (1991) have suggested that what is important is not so much what students are doing within the classroom but what the students are doing outwith the classroom, in terms of their study methods and study behaviours. Students are more likely to take responsibility for their own learning and to become more autonomous learners if adequate support is available at suitably timed stages of their course and they are rewarded appropriately within the university's assessment procedures.

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