

APPENDIX A ERROR! BOOKMARK NOT DEFINED.

BREAKDOWN OF EDUCATIONAL MODIFICATIONS IMPLEMENTED BY EIZENBERG. **ERROR! BOOKMARK NOT DEFINED.**

Table 1: Lecturers' descriptions of the aims of higher education: *Error! Bookmark not defined.*

Table 2: Personal transferable skills *Error! Bookmark not defined.*

Table 3: Approaches to studying *Error! Bookmark not defined.*

Table 4: Individual Forms of Understanding *Error! Bookmark not defined.*

Table 5: A learning environment designed to support a deep approach *Error! Bookmark not defined.*

APPENDIX B ERROR! BOOKMARK NOT DEFINED.

IDENTIFYING OPEN AND CLOSED ASSIGNMENTS AS A BASIS FOR ASSESSMENT CRITERIA **ERROR! BOOKMARK NOT DEFINED.**

FIGURE 1: ERROR! BOOKMARK NOT DEFINED.

THE LEARNING SYSTEM: A PEDAGOGIC MODEL **ERROR! BOOKMARK NOT DEFINED.**

FIGURE 2: ERROR! BOOKMARK NOT DEFINED.

TELRI PEDAGOGIC MODEL: THE LEARNING CYCLE MAPPED ONTO LEARNING PROCESSES **ERROR! BOOKMARK NOT DEFINED.**

FIGURE 3: ERROR! BOOKMARK NOT DEFINED.

LEARNING STYLE (AFTER KOLB & MYERS-BRIGGS) MAPPED ONTO THE LEARNING CYCLE. **ERROR! BOOKMARK NOT DEFINED.**

Executive Summary

Aims of the report

Overview

The aim of this report is to provide insight into issues surrounding learning and education that underpin the project objectives. It presents a preliminary framework – a pedagogic model - for the on-going work of the project and good educational practice in general. The model particularly emphasises the pedagogic processes required for developing research-orientated approaches to learning. The report is a working document and stems from a wide-reaching literature review including educational research and practice, together with interim conclusions from the project work. The latter draws on our own experiences in as both researchers and educational developers and on evaluation of current academic practice.

Section A describes the rationale underlying the project objectives and summarises the relevant factors involved in learning processes and educational systems, which are distilled from a more detailed account of the issues described in Section B: Learning and Section C: Education. Taken together, these factors inform the TELRI pedagogic model and form the basis of the future work of the project in implementing educational technologies and disseminating effective practice. In turn, the project outcomes aim to inform the development of institutional, departmental and individual learning and teaching strategies.

Disseminating project outcomes

The report will be adapted for various stakeholders, including:

- ◆ the preparation of academic papers;
- ◆ papers that inform academic quality assurance and enhancement processes;
- ◆ staff development materials and workshops;
- ◆ information and guidance packs for academic staff, departments, institutions and national bodies.

The presentation of materials and medium of dissemination require careful consideration in order that the TELRI framework might be utilised to best effect in informing policy and enhancing quality and effectiveness of academic practice.

Working with courses in specific subject areas

Selected courses from staff in participating departments in phase 1 (Warwick & Oxford) will be mapped onto the pedagogic framework. This enables specific research-led approaches to teaching and learning methodologies to be made explicit, subject-specific differences to be recognised. From this standpoint, the evolving framework is informed by discipline-related factors assists the project to best identify where technological solutions can enhance these approaches.

Informing national issues

Through the course of recent national developments, from Dearing to the ILT¹ and from the TQEF² institutional learning and teaching strategies to QAA³ and subject benchmarking, HEFCE have made it clear that these areas of enormous importance across the whole of HE. Methods of evaluating the effectiveness (and cost-effectiveness) of the TELRI approach will form an important part of this area of work.

¹ Institute for Learning and Teaching – accreditation of teaching as an HE profession.

² Teaching Quality Enhancement Fund – to be provided 1999/2000 to HE institutions for the development, implementation and evaluation of learning and teaching strategies.

³ Quality Assurance Agency

Embedding a research approach to learning into curricula using technology

TELRI Project Objectives

The focus of the TELRI project is in the implementation and evaluation of technology-based learning and teaching in research-led institutions. The project aims to examine the ways in which technology is, and can be, used to enhance the quality of undergraduate courses in research-led institutions. Phase one of the project focuses on the universities of Warwick and Oxford and phase two brings in the universities of Birmingham, Durham and Southampton.

Effectiveness of technology-assisted approaches

There has been long-standing debate regarding the use of technology to enhance the learning process with limited evidence of significant benefits in educational quality or cost-effectiveness to justify the increased IT infrastructure and support realistically required. The pressures following massification, modularisation, diversification, widening access, lifelong learning, and so on, and several IT-related programmes at national level, have nevertheless driven uptake in the use of educational technologies as institutions strive to implement ICT⁴ and to maintain educational quality. Uptake is not, however, a guarantee of improved quality or effectiveness in the long-term. Furthermore, many of these issues present no prevalent effect at present in universities like Warwick and Oxford, where student intake has remained of (seemingly) manageable type and number. The project is thus concerned to identify the needs of a research-led institution with respect to educational strategies and the benefits offered by ICT. This has implications for the staff who teach and the capabilities developed in the students.

Identifying and developing research capabilities

The implication of the project objectives is that the research capabilities and activities of the academic staff benefits the students attending these universities and differentiates them from students from institutions with less of a research emphasis. The project must, therefore, initially be concerned with identifying and defining specific factors associated with the undergraduate courses offered by Warwick and Oxford, as well as generic factors with respect to learning, education and the role of technology in these fields. Such factors include:

- The identification of research capabilities developed by the courses;
- The specific learning culture, education and infrastructure that such research-based institutions provide;
- The existing role of educational technologies and the possible future roles;
- The factors affecting staff adoption of educational technology.

Learning quality

The following questions are considered:

- Is there a relationship between the quality of courses offered by research-led institutions (as opposed to quality of students attracted) and the research capabilities/activities of academic staff?
- How might learning quality be defined and how does it relate to educational course quality?
- How might technology be used to enhance the quality of courses and as such the learning

⁴ Information and communications technology

quality of students?

Educational quality

Higher Education institutions benefit from insight into such questions for several reasons:

- The cost of educational technology infrastructure is not insubstantial, and increasing.
- It is undesirable for learning and teaching strategies and support mechanisms to foster solely increased *adoption* of educational technology in the absence of any learning quality improvements.
- Other factors associated with courses can compensate for inappropriate use of technology. The increase in, for example tutor support or the need for computer access may not be cost effective.

Identifying existing modes of learning

In the initial period, the project had been concerned with identifying modes of learning that exist at present and where appropriate targeting these for technological enhancement. After the initial few months of the project, it was realised that a model for research-orientated approaches to learning was required. Subsequent work with departments might provides insight into the relationship between the active engagement of academics in research in their specific discipline and issues influencing quality of teaching and learning in the discipline areas.

Since technological solutions are required that fulfil specific educational purposes, in most cases within the existing courses, the project has developed a descriptive model of education and learning, which is sympathetic to and inclusive of present working practice.

Learning

The process and purpose of learning

From the discussion concerning learning that follows in section B, it is proposed that true learning is the development and conveyance of meaning. With respect to learning strategies, therefore, students need to become expert in the process of learning. This is analogous to the argument that the *meaning* of a piece of work is not in its media but is conveyed by the media. This is achieved by active material engagement and expressed by methods and protocols as vehicles to this purpose.

The learning process should be presented and practised in a way that encourages the personal formation of inter-relationships and expression of knowledge, skills and concepts, as presented in Figure 1. The purpose of learning might therefore be achieved by the development and expression of personal ideas, meaning and ultimately, the aesthetic appreciation of a subject.

One approach might be to present students with challenges that encourage them to adopt strategies that develop a deeper understanding of the subject by engagement with novel scenarios. The model presented in figure 2 shows how the TELRI approach seeks to shift the learning approaches of students from surface learning and strategy design to deep learning. The tendency for the students to identify challenges which can be met with familiar strategies and superficial subject engagement is recognised by most academics. When actively engaged in research, the academics themselves are forced to adopt deeper learning strategies.

The learning cycle

Different components of learning, memorising, practice and reflection (Figure 1) present its own

set of learning problems. However, there appears to be an identifiable learning process, which can be represented by a learning cycle (Figure 2). It is shown that each of the learning components needs to be equally emphasised in order to develop the cycle. Deep understanding of the subject information or an appreciation of the subject is only developed when subject reasoning has to be generated by the student followed by good strategy design. Expression of these ideas then completes the cycle.

Assessment of learning

For the purpose of assessment (and feedback) of learning, it would be convenient if all learning were based on identifiable reasoning and logic, that all meaning was finite and definable and that therefore all expression of understanding was identifiable and definable. However, this does not appear to be the case. For the main part, concepts are ineffable and as such not transferable by information alone. Embedding the true nature of learning into course design can therefore be problematic for any assessment design. A danger in not doing so is that the motivation to learn inherent in "natural learning" approaches can be omitted.

Education

Learning strategies

In terms of educational systems, discussed in more detail in section C, the course culture and the assessment process to a large degree determines the students learning approach. This produces different "types" of learners, as represented in Figure 3. In terms of the assessment process, the style of assignment for example, open questions and closed questions, will determine the learning approach. This is, however only in relation to the assessment criteria themselves (appendix B). With open questions, these can promote set strategies, surface breadth of understanding, depth of understanding or creativity.

Students can have difficulty deconstructing any assignment down into achievable components and applying the required concepts. That is, they are not proficient in strategy design. Extensive deconstruction by the lecturer of the problems implied or guidance with the process may allow a broader remit for assignments.

Students often respond to a familiar assignment remit by presenting a surface breadth of understanding, which allows if not invites them to adopt learning strategies that are of little benefit later in the course or for future research activities.

Concept development and feedback

The development of concepts is directly related to the need to generate particular lines of reasoning in unfamiliar situations. This is similar to the difference between a monologue of the work and a dialogue with the work. Allowing the publishing of highly graded work can provide students with useful resource guidance and motivation. It may also provide a method of feedback where staff can see the effect this approach has on students' work, which in turn may allow and encourage greater diversity and higher grades. For the students, this would also provide a partial demonstration of what is the meaning of the explicit learning outcomes provided.

The dissemination of good practice requires a central focus, either virtual or beneficially physical. Ideas of quality or scholarship are holistic for both staff and students and each experience adds to the personal meaning of the concept. This holds true for transferable skills or study skills where those skills transferred are either tacit or holistic. A holistic skill which can be transferred is equivalent to expertise in (each aspect of) the learning cycle. This can provide a common purpose

across disciplines and therefore a framework for learning or educational quality.

Research-based approaches

Research-orientated courses may provide a vehicle for student focused study. The proposal process of conception, information acquisition, reflection, deconstruction and expression directly maps onto the full learning cycle in both emphasis and structure. The delivery and assessment of research-orientated courses needs to be undertaken with flexibility, an appreciation of both the value of the process and the value of ideas (right or wrong), justification reasoning and purpose. It would seem appropriate for these courses to be assessed by tutors who are familiar with the culture and process of research, as is mostly the case in research-led institutions.

Technological support

Technological support for such courses may require established facilities such as publishing for both lecturers and students, structured virtual forums, help guides for set tasks, Email, feedback facilities for the tutor and so on. It is, thus, essential that the technology, course and assessment provide a cohesive system where each component is inherently dependent on the others, i.e. the educational system experienced by the students is inherently integrated. In the absence of such cohesion, development in the use of technology in courses fails to produce cost-effective and long-term change. Furthermore, success can then only be evaluated on the basis of adoption and thus improved educational remains dubious.

The TELRI approach aims to demonstrate effective practice across the disciplines by implementing learning processes into courses in the participating departments that shift the learning approaches of students from surface learning and strategy design towards deep learning.