

## ETL Project Progress Report

1 January 2003 to 31 December 2003

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**Institutions:** University of Edinburgh in collaboration with the  
Universities of Coventry and Durham

<b>Project Team:</b>	Professor Dai Hounsell	Co-Director
	Professor Noel Entwistle	Co-Director
	Professor Ray Land	Associate Director
	Professor Erik Meyer	Associate Director
	Dr Charles Anderson	Associate Director
	Dr Kate Day	Associate Director
	Dr Velda McCune	Associate Director
	Dr Adrian Bromage	Research Fellow
	Dr Jennifer Nisbet	Research Fellow
	Dr Nicola Reimann	Research Fellow
	Mrs Jenny Hounsell	Research Administrator

### Original Aims

*Overall* our aim is to:

- Explore ways of strengthening undergraduate teaching-learning environments so as to improve student engagement and high quality learning.

*Specifically* the aims are to:

- Extend the range of disciplinary perspectives on research into teaching and learning in higher education by relating them more directly to the professional knowledge and experience of academic staff in five contrasting subject areas;
- Work collaboratively with departmental partners to provide a firm evidential and theoretical basis for suggesting specific collaborative initiatives;
- Develop instruments designed to help course teams evaluate the effectiveness of their teaching-learning environments in encouraging high level learning outcomes;
- Construct case studies from the five subject areas to illustrate how evidence and conceptual frameworks can be used to evaluate and strengthen teaching and learning.

### Research Design

The subject areas selected were biological sciences, economics, electronic engineering, history, and media and communications, and within these subject areas up to five departments were to be chosen. Within the departments selected, course units at contrasting levels would be identified as the focus for the study. In the first year of collaboration with the departments, a detailed description of the teaching-learning environment provided within each course unit would be constructed from documentary sources and interviews with academic staff. During that year, students would complete two questionnaires, one about their general approaches to studying, and the other about their specific approaches, their experiences of the teaching-learning environment, and what they felt they had achieved. Groups of students would also be interviewed to provide additional data on those

experiences. Analyses of these data would be reported to the course team as the evidential basis for discussion of possible collaborative initiatives. In the second year of collaboration, equivalent data would be collected and compared with the results from the previous year group, but with a specific focus on the experience of the collaborative initiative.

## **Practical Changes to Original Award**

Professor Dai Hounsell took over the role of principal award holder in January. Professor Ray Land moved to Coventry University, but he is retaining his involvement with the project and has become the Coventry Centre Director.

## **Report on Research Progress**

### *Ongoing development of conceptual frameworks*

The conceptual framework included as an Appendix to last year's report was explained in full through *Occasional Report 3* on our web site. The continued work on elaboration of two of our own concepts, *WTPs* (ways of thinking and practising in the subject) and *threshold concepts*, have been developed further and reported through conference papers and *Occasional Report 4*. The elaboration of the idea of *constructive alignment* has also continued and been described in conference papers.

### *Main phase of collaborative work with departments*

As indicated in the last progress report, work had to be discontinued in departments of media and communication studies due to staffing changes. However, a draft report on the findings to that point has been prepared and a revised version will be made available through our web site in this coming year.

The main activities of the project have been two-fold: first, completing the collection of baseline (first-round) data in the remaining eleven course settings; and second, in eight of the course settings where baseline data had already been collected and analysed, introducing and monitoring an agreed collaborative initiative.

The data we have been collecting is drawn from two student questionnaires, interviews with groups of students and key teaching staff, course documentation, and ongoing discussions with our departmental collaborators. While this may sound straightforward, data collection in other institutions and working with many different departments, as we had explained in our last progress report, involves substantial time and effort in advance organisation, co-ordination and travel. After last year's sometimes disappointing response rates from students, procedures were put in place to improve these and have led to much more satisfactory returns for 2003. We have thus far collected a total of 5639 student questionnaires (3621 LSQ and 2018 ETLQ). In all, 144 group interviews have been conducted with a total of 339 students, and 91 staff have been formally interviewed. Assessment grades have also subsequently been obtained from seven of these departments for the baseline year. We have 16 sets of grades in total.

Once the baseline data for a course unit have been collected and analysed, a detailed, confidential report (typically of up to 45 pages in length) has been prepared and submitted to the collaborating department. The report has then been discussed in a face-to-face meeting with key course team members, seeking to address, on the evidence presented, two closely interrelated questions: whether, firstly, there were aspects of the teaching-learning environment represented by the course unit which might be strengthened, with the aim of enhancing the quality of student learning; and secondly, how any such strengthening might feasibly be achieved, in the form of an agreed collaborative initiative. In the event, the feedback from students in three of the course units was so favourable that no collaborative initiative could readily be identified, while in two other course units changes in the circumstances of the staff, or in the institutional situation, prevented any further work taking place. However, collaborative initiatives have been agreed, and are being pursued, in four course units in Biological Sciences, five in Economics, four in Electronic Engineering, and six in History.

The nature of the collaborative initiatives has been extremely varied, as might be expected, since they have been designed to take account of the specific contexts created by disciplinary and institutional differences. They have also depended on the detailed feedback obtained from students and the

information about the course units provided by the staff. Although differing markedly in detail, the initiatives in each of the subject areas have drawn on one or more of the project's main constructs within the overall conceptual framework. In the following summaries, for example, ways of thinking and practising (WTPs) and constructive alignment (CA) run across subject areas, while threshold concepts and delayed understanding are more specific.

### *Biological Sciences*

The four bioscience course units in which collaborative initiatives are being pursued span three universities and first- and final-year modules. In each of the course settings, the collaborative initiative consists not of a single stand-alone innovation but rather a blend of measures which for the most part involve fine-tuning, strengthening or building upon existing practices, guided by CA. And while the specific blend arrived at varies from one setting to another, a number of common threads are evident. One is a heightened emphasis on what Perkins has called 'throughlines', deploying various measures to draw students' attention to vertical as well as horizontal curricular themes – chiefly those concerned with skills associated with biological WTPs. Another is fuller guidance to enhance students' grasp of what is expected of high-quality undergraduate work in first or final-year biology and the study strategies likely to be called for. And the third entails actions designed to enhance the provision of feedback to students, for example, through pro forma marking and commenting, seeking to link grades more explicitly to assessment criteria as well as achieve greater consistency across a team of markers; comment-rich, 'collective' or whole-class feedback; multiple-choice questions used formatively, to help students evaluate their grasp of subject-matter at an intermediate point in the module; and the use of feedback from peers, on students' seminar presentations, to help foster active engagement as well as to complement one-to-one tutor-generated feedback.

### *Economics*

While seeking to focus on WTPs and use CA to guide the collaborative initiatives in economics, work in this subject area has also been influenced by a number of contextual changes beyond our control which occurred between the two rounds of data collection. These include the effects of considerable decreases in recruitment, change in module leadership, the introduction of a virtual learning environment (VLE), and the introduction of multiple-choice question assessments (MCQs). The levels of engagement with ETL have also varied considerably between the partner departments. One collaborative initiative has been completed, based on the development of students' understanding of two *threshold concepts* throughout an academic year. In a second setting, the fast pace of the lectures and a perceived lack of depth have been addressed by increasing the lecture time from 1 to 2 hours. The course team's decision to introduce a VLE within the same module, however, will also have affected the outcome. The teaching-learning environment in a third setting was altered considerably by an institutional decision to increase the use of MCQs. Although the ETL data had highlighted other issues, it was accepted that the collaborative initiative would focus on the effect on student learning of introducing MCQs. The fourth collaborative initiative provided additional support and guidance for part-time students, particularly in relation to assessed work, while the final initiative has involved looking at the support provided for students who choose to work independently in preparing for two seen exam questions.

### *Electronic Engineering*

One of the main problems in the teaching of analogue engineering has been the difficulty students find with understanding of the wide variation in the working of the circuits they meet (WTPs). From our discussions with departmental collaborators and with students, we have identified what seem to be crucial aspects of teaching and learning which affect that understanding (CA). It seems that understanding depends on students not only doing a substantial number of tutorial problems, but also tackling them in a systematic and thoughtful way, rather than through routine procedures. Students also need to have sufficient worked examples and/or solutions to the tutorial problems to enable them to see where they have gone wrong in their own working. This represents the crucial feedback students need to learn effectively. Drawing from research into the development of expertise in other areas, we have been working with colleagues in three course units to encourage students make problem-solving more explicit. Students have been asked to use 'log books' (as engineers often do in industry) for their

attempts at solutions and to make comments in them on where they went wrong. We have also tried to encourage students to discuss the processes of problem solving with other students through group working in class or informally afterwards.

### *History*

History is a discipline characterised by considerable consensus about the WTPs that students should engage in and develop, but there is considerable variety in the curriculum, course design and contexts in which such learning actually takes place. Institutional policies, such as the introduction of VLEs, also impact on teaching and learning environments. Nevertheless, there are several common elements among the collaborative initiatives. One of the shared themes in the first year has been a commitment to a thematic rather than a chronological structure which has been combined with a greater explicitness, akin to throughlines, about the rationale for the course design. This explicitness has brought out the nature of history and the implications for students' ways of going about studying. The other common concern among the large first year course units has been ensuring greater consistency and equity in the teaching and learning experiences of the whole cohort. This has involved providing more tutor support, briefing and guidance, and increasing the opportunities for discussing approaches, for sharing practice and for pooling resources. The emphasis on students' appreciation of key features of the discipline, and on fostering the necessary subject skills, has been mirrored in our most recent initiatives, particularly in relation to the highlighting of historical controversy, the critical evaluation of primary and secondary sources, and the use of evidence.

### *Collaboration with other researcher groups and in development activities*

The collaboration with the European network on Powerful Learning Environments has continued. Professor Entwistle has attended both the workshops organised so far and presented a joint paper at each. The first paper described the early work of the project which has now been published in the EARLI Advances in Learning and Instruction Series published by Pergamon. The second paper has been submitted as part of an edition of the *International Journal of Educational Research*.

The work of the project has also contributed to the development of the questionnaire to be used in the National Survey of Students. Professor Entwistle is on the steering group and has been involved in discussing items for the pilot survey and has recently been helping in the design of a revised version drawing, in part, on our own *Experiences of Learning and Teaching Questionnaire*.

The LTSN in Economics identified *threshold concepts* as one of the areas in which it was calling for further work, and Professors Meyer and Land, the originators of the construct, are collaborators in a FDTL5 bid from several economics departments to extend our project work. The Engineering LTSN has also published a short report on our work on electronic engineering in one of their newsletters. An article discussing some of the initial findings in the biosciences is being prepared for publication in the Biology Education Electronics Journal, while in history a paper has been given at the LTSN's national conference on the teaching of history. Discussions are also underway with subject centres and other relevant bodies, as well as with departmental partners, on plans for jointly convened dissemination workshops and seminars in the closing stages of the project.

### *Difficulties encountered*

In negotiating and carrying out the collaborative initiatives some of the difficulties mentioned previously have become more marked. We had anticipated that there would be only limited possibilities for individual lecturers or course teams to introduce changes in their teaching, but these have had rather more effect on the project overall than we had expected. We also realised that changes would occur that might affect the collaborative initiative year, such as maternity leave and rescheduled sabbatical arrangements, and these have indeed affected our plans. However, the extent of other changes has proved much greater than could have been envisaged in 1999 when the proposal was formulated. Many universities have been in the process of restructuring departments and redesigning degree programmes, while some degree programmes have been withdrawn. The changes in the RAE are already causing major re-distributions of resources with knock-on effects on teaching arrangements. The overall impression is one of flux and instability rather than stasis, affecting staff deeply through uncertainty together with increasing pressure and stress, and having a direct impact on our project by constraining



the extent to which departmental partners have been willing or able to introduce collaborative initiatives while at the same time having to incorporate and respond to various other changes.

### *Changes introduced*

There have been no further changes in our objectives or design, although there may well be changes in the way the data from the collaborative initiatives will be analysed. The limited extent of the changes staff have been able to introduce into their teaching, and changes in circumstances affecting some course units, mean that it will be unrealistic to expect many marked or interpretable changes in students' approaches to studying or assessment grades within our target course units. We shall instead have to rely more on staff and students' perceptions of the effects of the collaborative initiatives through the interview and inventory data. It will, however, still be possible to investigate the aspects of teaching-learning environments that students appreciate most and least, as well as relationships between approaches to studying and their perceptions of those environments. No less importantly, we shall be in a position to report on how teaching-learning environments are evolving in an ever-changing context which continually presents new challenges.

### **Highlights of the Research**

There has been very little research into teaching and learning in higher education that has allowed systematic comparisons across subject areas, and that aspect of our design and findings should point an important way forward for future research and staff and institutional development. Our quantitative analyses are enabling us to highlight the aspects of teaching-learning environments that are most consistently related to approaches to studying and experiences of teaching. And our interviews with staff and students are opening up other important environmental influences on the quality of student learning, including the effects of diverse student intakes, course team size and role differentiation in modules with large classes, resources and time available, teaching traditions within the discipline, and departmental and institutional cultures and policies. And the design of collaborative initiatives has compelled us to think about ways of enhancing teaching and learning that are responsive to the specific contexts of subject area and institution, as well as to the markedly different challenges posed by first and final year course units. At the same time, developments in the construct describing 'ways of thinking and practising in the subject' are providing us, and some of our departmental partners, with fresh insights into the nature of high-quality learning and its facilitation.

In our interactions with our departmental partners, it has already become clear that different styles of reporting have to be adopted for different disciplines, depending on the contrasting ways in which colleagues are accustomed to use evidence and develop models and theories. In moving towards the dissemination phase of the project we shall be developing better ways of communicating our findings to these very different audiences, trying to use a set of terms and a discourse that speaks more directly to the academic staff involved. We shall also be able to use practical examples from within the separate subject areas to illustrate the conceptual issues that our findings are already beginning to raise.

### **Key Findings**

- The notion of *constructive alignment*, albeit in adapted and extended form, has proved useful both in analysing teaching-learning environments and in developing and reviewing collaborative initiatives. It is also drawing attention to the need, in higher education, to ally advances in course design and planning to more systematic strategies for curriculum implementation and monitoring.
- We are now better able to understand and describe the effects of contrasting subject areas, institutional contexts and current pressures on university teachers on the ways in which teaching and learning currently take place.
- *Ways of thinking and practising in the subject* appears to have considerable conceptual and practical potential in capturing key features of contemporary undergraduate learning which have hitherto not been to the fore.
- We are finding that different concepts have to be used to make sense of the contrasting approaches to teaching adopted across our four subject areas, which has important consequences for educational development.

## **Warrant**

The justification of our conclusions will come from several sources. As one intention of the programme is to produce 'usable' research findings, the value of our findings must inevitably depend, in part, on the extent to which we are seen to have produced such findings. We shall be able to offer conceptual frameworks and a way of thinking about research evidence for university teachers working in different contexts and under different conditions. And we shall be able to frame these within a recognisable reality, based on our experience during the project, and using a discourse appropriate to the differing subject areas. These now seem to be the essential pre-requisites for helping staff to enhance the teaching-learning environments in undergraduate courses.

Research quality is, however judged mainly by the research community and follows the conventions of 'disciplined enquiry' within a field where even the criteria for judging research quality are deeply contested. We are ensuring that the procedures followed with both quantitative and qualitative analyses conform to current conventions of 'best practice'. The justifications for our specific findings will come from the interplay of our own qualitative and quantitative analyses with the existing literature on teaching and learning in higher education.

## **Progress and Strategies Towards Programme Aims**

### *Enhancing learning outcomes*

As already indicated, it will be difficult to demonstrate specific changes in students' learning outcomes that can be shown to be directly attributable to the changes introduced in any one course unit. However, the cumulative evidence from student and staff perceptions, and our own experience, across a range of subject areas and contexts will offer a fertile source of insights and guidelines.

### *User engagement*

Departmental partners have been actively involved in planning and carrying out the collaborative initiatives. They have also been discussing the reports we have prepared both from the baseline analyses and from the evaluation of the collaborative initiatives, as these are completed (mainly next year). We hope to be able to draw on their indispensable expertise and experiences in various ways in reporting and discussing the main findings of the project, while also liaising closely with subject teaching centres and relevant professional bodies. Already co-presentations with departmental partners have been arranged, or are planned, in all our subject areas.

### *Developing synergies*

We mentioned in last year's report the various forms of synergy created by our multi-disciplinary team and our differing techniques of data collection and analysis, and we have extended the collaboration we have with other research groups, nationally and internationally. We have arranged a meeting with two of the higher education Phase III projects and we shall shortly be submitting a bid for an inter-project colloquium to support that activity.

### *Developing research expertise*

Our work has already had an important awareness-raising function, enhancing partners and other users' understanding of the possibilities of pedagogical research. And putting our questionnaires on our project website at the earliest opportunity, accompanied by background documentation, has helped promote the interchange of expertise and insights amongst those actively developing cognate research tools. As we approach the final stages of the project, we shall need to reflect on how we might best promulgate expertise in analysing the interpreting our questionnaires, while also considering how we might fruitfully pool and share our experiences of conducting group interviews with students.

### *Transforming knowledge*

Our work in developing collaborative initiatives has necessitated transforming knowledge about teaching and learning at university to make it more specific to distinct subject areas and also more intelligible to users through trying to tailor our reports to the discourse conventions of each subject area.

## Publications

- Beatty, E. and Land, R. (2003) The ETL Project – identifying high quality learning in specific disciplinary contexts. *Research and Development in Higher Education*, Proceedings of the Higher Education Research and Development Society of Australasia Conference, Vol. 25.
- Entwistle, N. (2003) *Concepts and Conceptual Frameworks Underpinning the ETL Project*. ETL Project Occasional Report, No. 3. <http://www.ed.ac.uk/etl/publications.html>
- Entwistle, N. (2003). Enhancing teaching-learning environments to encourage deep learning. In E, De Corte (Ed.) *Excellence in Higher Education*. London: Portland Press.
- Entwistle, N., McCune, V. and Hounsell, J. (2003) Investigating ways of enhancing university teaching-learning environments: measuring students' approaches to studying and perceptions of teaching. In: De Corte, E. Verschaffel, L., Entwistle, N. J., & van Merriënboer, J. (Eds.) *Unravelling Basic Components and Dimensions of Powerful Learning Environments*. Oxford: Elsevier Science.
- Entwistle, N. J and McCune, V. S. (in press) The conceptual bases of study strategy inventories in higher education. *Educational Psychology Review*.
- Entwistle, N. and Peterson, E. (in press). Conceptions of learning and knowledge in higher education: relationships with study behaviour and influences of learning environments. *International Journal of Educational Research*.
- McCune, V. (2003) The Enhancing Teaching-Learning Environments in Undergraduate Courses (ETL) Project: implications for educational developers *Educational Developments*, Vol. 4, No. 1, pp.1-2
- McCune, V. and Reimann, N. (2003) The Enhancing Teaching-Learning Environments in Undergraduate Courses Project: early findings. In: Rust, C. (ed.) *Improving Student Learning: Theory and Practice – 10 Years On*. Proceedings of the 10th Improving Student Learning Conference. Oxford: OCLSD.
- Meyer, J.H.F. and Land, L.R. (2003) Threshold concepts and troublesome knowledge (1): linkages to ways of thinking and practising within the disciplines. In: Rust, C. (ed.) *Improving Student Learning: Theory and Practice – 10 Years On*. Proceedings of the 10th Improving Student Learning Conference. pp. 412-424. Oxford: OCLSD.
- Meyer, J.H.F. and Land, L.R. (2003) *Threshold Concepts and Troublesome Knowledge: Linkages to Ways of Thinking and Practising within the Disciplines*. ETL Project Occasional Report, No. 4. <http://www.ed.ac.uk/etl/publications.html>

## Working papers

- Entwistle, N. (2003) Conceptions of teaching and learning from research in higher education. Working paper as contribution to TLRP discussion of conceptions of learning and teaching.

## Presentations

- Anderson, C., Day, K. and Foyster, E. (2003) Exploring Learning and Teaching in History: Some Perspectives from the ETL Project. LTSN Conference for the Development of Teaching and Learning in History, Lancaster, 9-11 April
- Anderson, C. and Day, K. (2003) Making History: Engaging Students in the Values and Practices of a Discipline. EARLI 10th Biennial Conference, Padova, Italy, 26-30 August. Also presented at BERA Annual Conference, Heriot-Watt University, 11-13 September
- Cousin, G. (2003) Threshold Concepts, Troublesome Knowledge and Learning About Others. EARLI 10th Biennial Conference, Padova, Italy, 26-30 August
- Entwistle, N. (2003) Enhancing Teaching-Learning Environments in Undergraduate Courses. Scottish Council for Research on Education conference, Dunfermline, 9 May
- Entwistle, N. and Peterson, E. (2003) Conceptions of Learning and Knowledge in Higher Education: relationships with study behaviour and influences of learning environments, Leuven Network, Antwerp, Netherlands, 15-18 May

- Entwistle, N. (2003) University Teaching-Learning Environments and their Influences on Student Learning: An Introduction to the ETL Project. EARLI 10th Biennial Conference, Padova, Italy, 26-30 August. Also presented at BERA Annual Conference, Heriot-Watt University, 26-30 September
- Hounsell, D. (2003) Enhancing Teaching-Learning Environments in Undergraduate Courses. Imagining Higher Education seminar, University of Leicester, 30 April
- Hounsell, D. (2003) Enhancing Teaching-Learning Environments. Sharing Excellence - Improving Student Learning conference, University of Surrey, 10 June
- Hounsell, D. (2003) Research and Scholarship in Undergraduate Teaching-Learning Environments. 2nd NTU Conference on Developing Synergies between Teaching and Learning and Research, Nottingham Trent University, 16 December
- McCune V. (2003) The Enhancing teaching-learning environments in undergraduate courses (ETL) project: introduction and emerging findings. Health Care Education Development Unit, St Bartholomew School of Nursing and Midwifery, City University, London, 24 February
- McCune, V. (2003) Promoting High Quality Learning: Perspectives from the ETL Project. Norwegian Network in Higher Education 14th Conference on University and College Pedagogy, Fredrikstad, Norway, 23 October.
- McCune, V., Hounsell, D. and Nisbet, J. (2003) Final-Year Biology Courses as Teaching-Learning Environments. EARLI 10th Biennial Conference, Padova, Italy, 26-30 August. Also presented at BERA Annual Conference, Heriot-Watt University, 11-13 September
- Meyer, J.H.F. (2003) Threshold Concepts and Student-centred Teaching. Symposium, Imperial College of Science, Technology and Medicine, London, 4 February and Anglia Polytechnic University, 27 February
- Meyer, J.H.F. (2003) Threshold Concepts. International Symposium on Approaches to Learning in Accounting Education. University of Sydney, Australia, 17-18 February
- Meyer, J.H.F. (2003). Some New Perspectives on Teaching and Learning in Economics. Economics LTSN South West & South Wales regional meeting, Bristol, 13 May
- Meyer, J.H.F. and Land, L.R. (2003) Threshold Concepts and Troublesome Knowledge (2): epistemological and ontological considerations and a conceptual framework for teaching and learning. EARLI 10th Biennial Conference, Padova, Italy, 26-30 August
- Meyer, J.H.F. and Shanahan, M.P. (2003) The Troublesome Nature of a Threshold Concept in Economics. EARLI 10th Biennial Conference, Padova, Italy, 26-30 August
- Meyer, J.H.F., Land, L.R., Cousin, G. and Davies, P. (2003). Threshold Concepts and Troublesome Knowledge (3): Implications for curriculum design and evaluation. Society for Research into Higher Education annual conference, London, 16-18 December 16-18
- Reimann, N. (2003) Enhancing Teaching-Learning Environments in Undergraduate Courses. Kingston University, 9 April
- Reimann, N. (2003) First-Year Teaching-Learning Environments in Economics. EARLI 10th Biennial Conference, Padova, Italy, 26-30 August. Also presented at BERA Annual Conference, Heriot-Watt University, 11-13 September
- Reimann, N. and Jackson, I. (2003) Threshold Concepts in Economics: A Case Study. EARLI 10th Biennial Conference, Padova, Italy, 26-30 August
- Reimann, N. and Jackson, I. (2003) Threshold Concepts in Economics: A Case Study. LTSN Developments in Economics and Business Education conference, Heriot-Watt University, 15-16 September