Discussion Points of the Project Group Meeting of the 12th September 2006.

Types of Integration

We discussed the two types of integration that were important given the development of our views of threshold concepts in economics:

(1) How you integrate knowledge in yourself and how you interpret the world – the integration into thinking about everyday life.
(2) The integration within the subject of the threshold concepts and the web of concepts.

Multiple choice questions such as the ones discussed below (in the section on Establishing pre and sub liminal variation) are more likely to be appropriate for examining the first of these aspects of integration. In our overall approach to assessment we need to recognise this, as we have stressed the importance of the second of these in the development of our approach. Problem based questions can be used for this and it would be interesting to compare the similarity of in response/ performance by students and what that is telling us.

'Craft ability' as shown for instance by the pricing policy of a hotel keeper was discussed. There is the integration into a particular context of personal experience and integration that is more generalised. 'Craft knowledge' could be very context specific. We considered implicit knowledge and that most knowledge is heavily contextualised. Most students will reproduce knowledge within the context taught. An important test of integration is whether, if the context is shifted can they carry the understanding and integration. In fact, most students cannot do that.

It was suggested that Problem Based Learning was good in terms of encouraging integration into thinking about everyday life; it may also make it difficult for students to see the elements in the problem. They may relate the theoretical concepts to the specific problem, rather than establish the general pattern of understanding that is stressed with threshold concepts.

We discussed that there are two approaches to problems: the deconstruct/ reconstruct way of tackling a problem or the holistic. We considered that we saw the approach in economics to analysing a question as unpicking it then reconfiguring it. However, simply piecing the elements together at the end maybe learnt as another more extensive section that is bigger and more difficult. This seems in line with what Perkins calls the 'toolkit fallacy'. It is not just all the concepts in the programme - it is the way of thinking and practicing – which brings it together. Instead we want to engender thinking in terms of here is one part, here is another and then how do these two relate? Then a third – how does this relate to the other two - before moving on. As an example we considered opportunity cost and comparative advantage, where it may not be made it sufficiently clear to students how these things are related.

What this project has done is moved the framework on to consider the web, the framework of economic concepts. At the Glasgow conference Perkins seemed to be using ‘episteme’ in similar way, while Peter Goodyear uses the phrase epistemic fluency – a way of learning that can draw on various domains within this epistemic terrain. In order to answer a question the learner has to draw on a repertoire in quite a fluent way. If we are saying this at the theoretical level, it would be nice to get some data that shows whether some students can handle this and others cannot and what kind of pedagogies encourages or enables this.

The Implications for Assessment

Threshold concepts are articulating what economists really want their students to learn. In so for as current assessment does not pick that up there is a mismatch between what they want and what they encouraging students to think that they are expected to learn. Examinations as now set concentrate on heavily ‘signposted’ questions. This requires a change in typical style of assessment and a move away from the detailed scaffolding that is given currently with most examination questions. We discussed how short answer questions with problem scenarios can examine the second type of integration. As an example we considered a question that asked what will be the effects, and the timing of these, of a large increase in tax on large cars. The important thing is NOT to put in the clue of price changes. What is needed is a compound problem that has a number of elements and where to answer requires the identification of threshold concepts and other concepts of use first (dividing down to elements) then reconfiguring (how these elements combine). The question was then raised of how far do we want to go in testing students’ preliminary understanding before going into this combination?

If we are going to examine this kind of integration in examination questions, as a general principle we do not want to signal the way of thinking we are looking for by giving explicit clues in terms of how the question is to be answered. We want to have questions that are in the form that leaves it up to the student to think ‘how am I meant to be answering this?’ We also discussed two or three part questions, bringing the integration into the later parts. For instance, part a) showing some basic knowledge such as a definition b) an application in a strictly defined context c) a wider question that takes the students out of context and is not signposted. We discussed a possible difficulty with this that students often have difficulty in marshalling an argument (even at the better universities) and tend to regurgitate material. The concentration on threshold concepts may help them be able to tackle such ‘unsignposted’ questions. It is not that we are requiring more economics as such, but trying to get them to start to think in a different way - learning to unpick and reconstruct.

While proposing a general principle of not signalling the way of thinking required in examinations to test this integration, we felt that this should be clearly considered in the pedagogy. In teaching, the economists’ approach and reason for this should be considered explicitly and in different ways. Teaching tools could involve using examples of past exam answers. A possible method was to give them the question first, then give them past answers to compare, with the tutor drawing attention to the importance of threshold concepts. Alternatively, different past answers could be given for students to assess. Another more difficult question was to ask students to set questions that could be a good test. We agreed we should construct a working list of what we regard as 'nice' questions and keep this a standing item on the agenda. These could be used both summatively and formatively for assessment.

Erik Meyer raised the problem that in giving students past answers to consider they may not recognise qualitative differences in the answer and may have varying degrees of comprehension of what a university examination is like. The student has to grasp simultaneously several things (1) qualitative differences in the answers (2) what university examiners are looking for. (3) how examiners mark this. One suggested way of getting around this was the Biggs and Collins rainfall on the mountain example which offers expansions of reasons. Students are asked how they would mark it to get them thinking as in an exam. The example does not require specialist knowledge.

Establishing pre- and sub-liminal variation

We discussed using the multiple choice questions used in the Shanahan, Foster and Meyer paper that had been presented at the Glasgow symposium. The questions have been found to have huge predictive validity in terms of student performance. The questions are given in week 3 and 10 of the semester in the Australian setting. The paper presented in the symposium indicated that the questions that dealt with discipline threshold and modelling concepts were more important predictors than those that only contained basic concepts. It was agreed that it is important to distinguish between questions that used everyday language and those that used economic language and that the former are more relevant when determining variation. Whilst many of the questions used by Shanahan *et al.* contain no economic language some from the TEL made explicit use of economic language (such as the term opportunity cost). Dave Allen reported that he had been developing some 'non-economic language' questions that covered various discipline and modelling threshold concepts. These were slightly shorter than the Shanahan versions, which may be useful simply because of the time we could allow complete such questionnaires in lectures.

It was felt that the applied settings of this type of question allowed identification of variation and recorded the integration of understanding in terms of personal use by the learner. By asking the same questions twice at different stages we could track development of such integration and whether this differed given the background of the students (in particular A level economics/A level business or not). We discussed two possible models of implementation:

(a) asking the same questions in the first and last sessions
(b) asking the questions in the first session, keeping the students' answers and returning it to them in the last lecture. Students would be asked if they still agreed with their answer and if they did not to give a short explanation of why. It was hoped that this version would engender a sense of transformation in the student.

It was also felt to be useful to ask students their current attitude to economics. This may differ between specialists and non-specialists/ business studies students. A negative attitude may have been encouraged in schools to justify the availability of business studies over economics.

Transferability funding

We considered bidding for transferability funding and agreed it was important to do this. We discussed using the kind of dissemination strategy that had been used by the WINECON project, using facilitators that visited universities to discuss with the lecturers on a one-to-one or small group basis how our products can help them. There were four types of products that we may usefully offer: firstly what we considered to be the threshold concepts in economics and why; secondly our teaching and learning materials; thirdly aspects of curriculum design related to threshold concepts; fourthly aspects of assessment. As well as with economics students, we were starting to embed in Business Studies economics modules at level one. We were aware of areas in our own institutions which used economics in a wider sense and where our approach could be useful, such as Global Business Awareness awards and MBAs. We were also aware of disciplines, such as geography, where interest had been shown in our approach. The Subject Centre may help in taking a facilitator roll by for instance, by helping with opening the doors to other institutions. We also considered that it may be important to be involved with the Subject Centre's new lecturers' workshop.

We discussed the possibility of funding for developing the materials on-line. Interest had been expressed by Durham and by Oxford Brookes in using on-line versions. It was suggested it may be more appropriate to apply for JISC funding for this.

Interview analysis

The interviews from last academic year are to be coded using Nvivo. The original purpose of interviews was to gather information on the student's experience of significant change in their experience of economics. We were concerned with their development from everyday thinking into discipline thinking and then back, transforming their approach to thinking about every day problems. We were also looking for signs of integration – were there any signs of bringing together their disciplinarily thinking.

We discussed what was meant by the proposed coding of 'self deprecation'. Was it the specific problem they were working on at the time, the economic problem, or a learning problem as this has implications with type of intervention you might want to make? We considered it in terms of blaming others or blaming themselves for a lack of understanding. We also discussed the proposals on graphs in terms of relating these to the literature, where generally these were seem as 'bad' despite the heavy reliance on these in economics textbooks and teaching. Our interviews did suggest that some students had problems, but also that others found them very helpful, and this may be linked to their grasp of abstraction and in particular comparative static analysis.

We agree we were happy with the list currently proposed, with the addition of abstraction. Analysis of the interviews in this way should proceed dynamically with the categories being adjusted as the analysis proceeds. It was best to start with a small random sample of interviews, add additional codes needed and deletes those of little use and then go back and recode. It was better than one person did all the coding for consistency, or that it was done by two persons independently.

Embedding Threshold Concepts and Evidence to be Collected this Year.

We discussed the implementation at each institution and considered the proposed plans for embedding at Staffordshire and UWE in some detail. At Staffordshire we were aiming to run a trial with business studies students where some tutorials used our activities and some did not. There would also be substantial use of the exercises on the macroeconomics course to economics and accounting students. At UWE the handbook introduces the approach, there would be use of approximately 20 questions in the first lecture to identifying variation, use of every significant relevant exercise, a lecturer's journal that recorded students reaction to the activities etc., the PDPs will identifying Threshold Concepts in each theme, the January test would include an applied problem 'how would you go about solving this problem?', students will be given a list of questions as 'past exam question' that reflect threshold concepts and told one will appear on the examination.

In terms of evidence collection, we discussed the short time we had at this point to collect and analyse data within the project's timescale and felt it was important to concentrate on the fourth aspect of data collection on the circulated sheet: *Evidence on improved understanding (or not) through use of threshold concepts.* That is we need to get evidence on whether there is improved understanding **after** doing the activities. This should include an analysis of assessment and differences between groups where we are using the activities and where we are not. Elsewhere our interest was in the process – what are students doing and how does this align with what we want then to do. We discussed three particular types of evidence we wanted.

1. The recording some sessions where one of our activities were being used. We considered we should aim for twice in each institution.

2. Outcomes of writing (for instance the later parts of the reflective exercises). We noted that this was not the end point in the process as students were then asked to reflect.

3. Further interviews that focused on the activities and included asking students what happened afterwards (to partly deal with the point above). We may also want to interview some to get an 'end of module' view and we noted that the ETL project had found students particularly willing to talk before examinations, perhaps because of a heightened sense of anxiety.

We given our discussion we considered that we needed from each institution:

1. what the teaching implementation is – what module, what exercises and how it is integrated into the curriculum.
2. what adaptation is being done to the assessment
3. how is evidence being gathered about students experience and the outcomes of that experience?
4. is information going to be collected about the teacher's experience?
5. basic evidence on the activities we did not trial this year if they are being used

We went on to discuss whether we should make the data available to others (for future analysis). We considered making such a resource available to other researchers was a good and could be considered as an additional output of the project. We discussed the ethics of this and need to go back to what we had told students last year and modify this year if necessary.

Conferences and other dissemination issues

We reported that we had had a paper accepted for the ASSA conference in January and that we had submitted a proposal for a symposium to SRHE in December.

We discussed our possible contribution at two forthcoming conferences in more detail:

a) EARLI - a proposed symposium on Threshold Concepts and Economics (with 4 or 5 papers). The conference date was late August 2007 and the deadline for submission was the end of November. It was agreed that we should approach Martin Shanahan and Ming-Fai PANG to see if they wanted to join us. We considered asking Dirk Tempelaar, but needed to determine the overall feel of the symposium before doing this. Anastasia Efklides was suggested as a discussant.
b) DEBE 6/7th September, Cambridge. We agreed in discussion with John Sloman that a whole session at DEBE was appropriate. We felt it would be important to involve different members of the team presenting what issues have been involved in implementation at their institution and what they have got out of it.
   We discussed the role of a project symposium, but decided that the session at DEBE was likely to reach a wider audience in terms of economics educators. Our other target audience, other disciplines and Threshold Concepts were better served by the specialised symposium such the one in Glasgow in August that we were involved with.

We discussed that we were unlikely to have analysed all aspects of the data before the end of the project next September and that we would want to keep some momentum going. We discussed research informed teaching funding as a possible source of funding and how this could be interpreted in various ways, including pedagogic research.

The Annual Report to HEA 2005/6

An early draft was circulated to the team and we considered our achievements relative to our objectives and our plans for next year. We felt that we had achieved substantial output. The list of conference papers given and other forms of dissemination was useful and discussed if the presentations and workshops given by our consultants on threshold concepts should be included in the list. Since this project was always mentioned directly, even in general presentations, we felt it was appropriate. We also discussed being proactive within our own institutions in the teaching and learning development in the coming year, both at the institution and faculty level as at this stage of the project we have developed an approach that we would expect to have use outside of economics.

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