EXPLORING THRESHOLD CONCEPTS FOR LINKING TEACHNG AND RESEARCH

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In this paper, I argue that pedagogic research organised around the investigation of threshold concepts (2006) offers a promising way in which academics can link their teaching and research activities. I will first introduce the research into threshold concepts, contrasting it with the phenomenographic tradition and the directions this has prompted for educational developers (or faculty/academic developers). I will then argue how the investigation into threshold concepts enables subject specialists to marry their commitment to the research of their subject to its teaching.

Introduction

The idea of threshold concepts emerged from a UK national research project into the possible characteristics of strong teaching and learning environments in the disciplines for undergraduate education (Enhancing Teaching-Learning Environments in Undergraduate *(*http://www,tlrp.org*)*. From involvement in the economics strand of this research, Erik Meyer and Ray Land (2006), that certain concepts were held by economists to be central to the mastery of their subject. These concepts, Meyer and Land argued could be described as 'threshold' ones because they have certain features in common as described by the following five key characteristics:

1. Grasping a threshold concept is *transformative* because it involves an ontological as well as a conceptual shift. We are what we know. New understandings are assimilated into our biography, becoming part of who we are, how we see and how we feel. When academics announce that they are a sociologist, biologist, etc, they are announcing both their expertise and their identity, an identity which marks an arrival from being a student of sociology, biology, etc. to someone who thinks and acts like an 'ologist' of one kind or another. Those concerned with linking teaching and research are keen to progress this identity journey among their students.

2. A threshold concept is often *irreversible*; once understood the learner is unlikely to forget it (this does not exclude revision or rejection of the concept once understood). One of the difficulties teachers have is that of retracing the journey back to their own days of 'innocence', when understandings of threshold concepts alluded them in the early stages of their own learning. Their own understandings have become so internalised that it is hard for them to sympathise with students who are in a 'liminal state', of which more below.

3. Another characteristic of a threshold concept is that it is *integrative* in that it exposes the hidden interrelatedness of phenomenon. Mastery of a threshold concept often allows the learner to make connections that were hitherto hidden from their view. Things start to click into place.

4. A threshold concept is likely to be *bounded* in that 'any conceptual space will have terminal frontiers, bordering with thresholds into new conceptual areas' (Meyer and Land, 2003: 6). Terminal frontiers may be an outcome of disciplinary gate keeping and as such, it is important for subject specialists to see threshold concepts in their areas as providing some kind of provisional handle on whatever they are exploring. The theory of threshold concepts is a theory of difficulty that appreciates the contingent, contextual, historical and contested nature of any concept in any discipline.

5. Finally, a threshold concept is likely to involve forms of '*troublesome knowledge';* David Perkins (2006) describes such knowledge as 'that which appears counter-intuitive, alien (emanating from another culture or discourse), or seemingly incoherent' (in Meyer and Land (2003:7). Mastery of a threshold concept can be inhibited by the prevalence of a 'common sense' or intuitive understanding of it. Similarly, Caryl Sibbett (2006: 127) proposes the notion of 'nettlesome' knowledge as knowledge which is somehow taboo and 'if grasped, it might 'sting' and thus evoke a feared intense emotional and *embodied* response' My own work takes up this aspect of knowledge through an exploration of the teaching and learning of otherness (Cousin, 2006)

The above then are the characteristics of threshold concepts. I would not want to encourage a purist view in which all of these characteristics must be present in equal measure in any threshold concept. The value of the theory of threshold concepts lays in its ability to prompt our thinking about questions of mastery through the lens of the subject and its insistence that learning is as much about identity disturbance and formation as it is about cognition.

In investigating the understanding of threshold concepts in different subject areas, Meyer and Land (2003) take from the cultural anthropologist Turner, the idea of liminality; this idea provides a useful way of thinking about troublesome knowledge and learner discomfort. Learning, argue Meyer and Land (2003) involves the occupation of a liminal space during the process of mastery of a threshold concept. This space is similar to the one occupied by adolescents who are not yet adults; not quite children. It is an unstable space in which the learner may oscillate between old and emergent understandings just as adolescents often move between adult like and child like responses to their transitional status. Once a learner enters this liminal space, she is engaged with the project of mastery unlike the learner who remains in a state of pre-liminality in which understandings are at best vague.

It needs acknowledging that Lave and Wenger (1991) also use an anthropological lens through which to view how the ontological and the epistemological connect for learning. Indeed it could be argued that Lave and Wenger's (1991) notion of peripheral participation is akin to that of liminality. Similarly, Lave and Wenger insist that learning always involves a process of becoming that is never reducible to a cognitive or technical processs. However, the emphasis in Lave and Wenger's writings is on the informal learning that takes place in work based communities rather than in the formal curriculum provided by universities. While we get much to think about from Lave and Wenger (1991) in terms of the social difficulties that attend initiation and the maintenance of learner and subject/professional identities, there is less on the linkage of these difficulties with the mastery of difficulty. In short, there is a lot about creating the conditions for learning, about the need to 'be there' (in a community of practice) but not so much detail on 'doing there'. In my view, where we can most fruitfully cross fertilise the concept of peripheral participation with that of liminality is in the encourgement in universities of developing what Brew (2006) has called inclusive 'communities of scholars', that is communities of students and academics researching together to include, as I discuss below, curriculum inquiry.

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In the phenomenographic research tradition (Saljo and Marton,1976), the student on the edge of understanding is likely to be said to take a surface approach and the student who is tackling mastery in a more developmental space is likely to be seen to take a deep approach. What the theory of threshold concepts adds to these insights is that these approaches are not simply about strategic choices, study cultures formed overtime or teaching methods (important though these factors may be) since they are also about affective states in relation to the subject. In this respect, as indicated, the transformative nature of threshold concepts is key. Once she has grasped a threshold concept, the student's self-relation to the subject changes; it represents a moment of deep learning that enables further deep learning. No longer a student of Spanish but now a speaker of Spanish.

The lack of mastery, on the other hand, invites mimicry which is a form of surface learning that can serve as a 'transitional object' to get the learner across liminal states or it can arrest mastery and veer dangerously close to plagerism. (Meyer and Shanahan,2006) Of course, the teacher cannot control for all the variables that facilitate successful journeys across liminal states but by staging curriculum inquiry around the difficulty of the subject, he address those that he can and by doing so crucially, he embraces a care ethic to support the learner which is not severed from his care for his subject based research.

Viewing the question of student understanding from the theoretical viewpoint of threshold concepts invites a review of how educational developers and researchers work with subject specialists; here I want to argue that this invitation involves rethinking the student-centred movement prompted by

phenomenographic research and the separation this has implied for teaching and research.I think it is fair to say that most academics who have been exposed to the insights of phenomenographic research accept that higher education teaching and learning has benefited from the changes stimulated by its findings and by the student-centred curriculum design suggested by it. Evaluative evidence collected by universities invariably point to learner appreciation of assessment which is clearly aligned to learning outcomes, helpful formative feedback and opportunities to evaluate teaching. However, it is also true that educational developers and researchers have experienced anything ranging from indifference to hostility from academics who are suspicious of the changes they are asked to make. Many educational developers defensively package this suspicion as learner resistance and ignorance, seeing their challenge to be that of leading academics to the true path of student-centred teaching and learning.

I want to suggest that an unintended outcome of this student experience tradition has been what one writer describes as 'the mortification of the teacherly self' (McShane, K ,2006). This Goffmanesque melodramatic notion aids an exploration into how educational developers have often viewed their task as that of dismantling and outlawing 'teacher-centredness' in favour of 'student-centredness'. That is not to say that all educational developers subscribe to this view or to underestimate the powerful ways in which educational developers support the everyday survival of academic teachers from within the tradition of student-centredness.

I wonder whether those who deride educational developers who promote student-centredness as a shallow 'hints and tips' tribe are worried that getting students to break out into small groups in seminars or to talk to their neighbours in lectures will somehow profane their subject and their academic status. Educational developers have not always trod carefully on territory which is held to be sacred by academics. In their objections to the 'crass developer', I sometimes detect a fear from academics that technique robs the teaching and learning event of its ceremonial, ritual content and its theatrical dimension, a feeling that while traditional lectures may not be effective in linear, aligned ways, it debases their purpose to worry about this because they have a grander role. There is a strong sense in which lectures perform identity work for both teachers and students, enabling each to feel part of the university and of the subject community. Moreover, the lecture theatre *is* a sacred place in the sense that it delineates a space where academics hope to exercise their freedom, where radical, interesting, contentious ideas are tested and voiced from behind a lectern.

What we need is to keep many of the insights and indeed hints and tips from the student centred tradition but to accept that it has probably 'exhausted its intellectual impulse' (to use Geertz' phrase, 1976). The binary of teacher and student centredness respectively has served a purpose but it is time to disturb it, not least because it carries with it a separation of research from teaching. Quite

rightly, educational developers have encouraged academics to complement caring for their subject through good research and scholarship with caring for their students through good teaching practices but getting this dual care ethic to cross fertilise has proved to be much more difficult. Moreover, as anyone involved in accredited teacher development courses knows, getting academics to theoretically underpin their reflections on their practice from educational theory is always an uphill struggle, with most stopping for a permanent rest at mount Kolb. This is understandable because subject specialists who are not social scientists are being asked to become informed amateurs in another discipline. Threshold concept research offers a way out of this problem because it squarely places subject specialists at the centre of an inquiry into the difficulty of their subject. In this way, there is a restoration of dignity for academics and a reconfiguration of the relationships between students, academics and educational researchers and developers within a framework of 'transactional curriculum inquiry', as I discuss below.

I am not suggesting that phenomenographic research never involved subject specialists – such a suggestion would ignore the many educational studies by subject specialists generated by this tradition. Indeed the entire SOTL (Scholarship of Teaching and Learning) movement generated by this tradition is about interesting academics in pedagogic research. However, there are some important differences between the research framework for deep and surface learning (phenomenography) and that of threshold concepts research (which does not have a settled methodological framework). Phenomenography explores student experiences for the discovery of variation in learners' reported ways of experiencing phenomenon. Phenomenographic research is *on* the students so that once extracted from them (often through interviews or surveys), the student experience data becomes the researcher's text to analyse, heightening the risk of the students' experience being represented through the researchers' experience of the students' experience. In so far as all research findings are the product of interpretation of some kind, I would not want to claim that threshold concept research escapes this problem entirely (indeed some threshold concept research draws heavily on this tradition) but there is an emergent trend in the research into threshold concepts that is apace with contemporary concerns about this kind of interpretive predicament.

Threshold concept research offers a form of transactional curriculum inquiry in that all the key players (academics, students, educationalists) can work iteratively together to explore the difficulty of the subject. What seemed clear from some of the papers arising from a recent symposium on threshold concepts (Strathclyde,2006) is the dialogue threshold concept research can generate between subject specialists, students and educationalists. For instance, Osmond, Turner and Land write: (2006:12)

Using threshold concepts as a framework has enabled the research team to ***open up a dialogue*** *with the staff in a discipline that appears, in the main, to be*

relatively under-theorised. This usefulness of the dialogue was evidenced during the whole-staff meeting and individual interviews by the enthusiasm of the staff to participate. (my emphasis)

The subject in question is that of automotive design and the staff referred to are internationally recognised as leading edge researchers in their field. The dialogue referred to by the authors centred on an exploration of spatial literacy; while these researchers had intuitive, tacit knowledge of this capability, they had never been asked to articulate it as a group, to probe how it can be mastered and the potentially troublesome dimensions to it. Threshold concept research stages the educational debate at the scene of the subject and its difficulty, allowing the academic to combine his expertise and commitment to his subject with an interest in how best to teach and learn it. Another good example of this 'opening up of a dialogue' is in Orsini-Jones (2006) action-research on 'crossing grammar thresholds', where there is an impressive back and forth movement of inquiry from academic to student in the exploration of the difficulty of grammatical concepts. Orsini-Jones' (2006) inquiry allowed the students to formulate and surface their struggles to master grammatical constructions and for the academics to formulate teaching and learning activities that might support them, testing these iteratively with the students. My point here is that whereas the convention in universities is to ask students to evaluate the quality of their teaching and learning support, the drift of threshold concept research is to share an inquiry into the difficulty of their subject *with* the academics.

In recent years, I have given a number of presentations on threshold concepts to academics; these usually involve an interactive moment in which I ask academics to think about possible candidates for threshold concepts in their discipline. There is always animated discussion following this request. I think this is because I am asking academics to deconstruct their subject rather than, say, their practice (at least in the first instance) and this is both safe and interesting territory. I suspect that such a deconstruction can also serve to refresh the academic's understanding of his own subject, as it seemed to do with the automotive designers referred to above, though this needs further research.

To conclude, I have argued that the search for threshold concepts has the potential to open up discussions among subject specialists, students and educational researchers, creating forms of transactional curriculum inquiry between these three parties. Further, I have argued that threshold concept research does not require the academic to learn another discipline; on the contrary, it requires that she goes more deeply into her own for the purposes of formulating the best ways of teaching and learning it, By staging the exploration at the site of the subject and of its difficulties, threshold concept research promises to harness an academic's research curiosity for his subject with a new curiosity about how best to teach it; this promise carries with it an enhanced capacity for research and teaching to be dynamically linked.

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