Threshold Concepts in Secondary Geography Education

Research report presented at The Geographical Association Annual Conference, University of Surrey, 16th April 2011

Jonathan Slinger,
Friends' School, Saffron Walden

The research topic

I was interested in investigating whether a threshold concepts framework could be usefully applied to secondary geography education and in particular whether identifying threshold concepts in a school level geography might tell us something about how to develop or enable students' capabilities in terms of 'thinking geographically'. I asked the question, "What contribution could a threshold concepts framework make to curriculum and pedagogic practice within secondary level geography?"

The background to this research

It appears that a threshold concepts approach has proven a productive framework in enhancing teaching and learning practices across a range of disciplines in higher education and has shown promise to other education sectors.

I took as a starting point a number of recent developments within secondary geography education:

- Lambert and Morgan's (2010) idea that geography’s conceptual frameworks can be used as a resource for teachers as curriculum makers and for students as knowledge makers
- Emphasis on a living geography where young people's experience of the world is taken seriously and used as a starting point in developing geographical understanding
- The importance of learning that takes place where possible in situated real-world contexts
- These initiatives and the new curricula at KS3, 4 and 5 open up spaces for innovative curriculum development and revised pedagogic practices.

Also of concern was that initiatives such as the Key Stage 3 Strategy have had some profound effects in emphasising pedagogy at the expense of deeper learning within subjects, and that this imbalance needs redressing.

In an attempt to further refine the research problem I posed a number of additional questions: In (re)making our curriculum:

- Do we have the pedagogical resources to more fully promote geographical thinking, democratise learning spaces, demystify and make more explicit disciplinary practices and ways of thinking?
- Do we have adequate ways of assessing progress in conceptual thinking and in particular, identifying students who show transformed, integrative, relational and disciplinary thinking?
- Do we have an adequate professional vocabulary and research methodologies to make sense of student conceptual difficulty and adequate practices to help students negotiate and manage the transformations (conceptual and in identity terms) involved in thinking in revised and disciplinary ways?
- Do we have sufficient planning tools to translate conceptually-led curriculum aims into learning sequences?
- Do we need to identify suitable research methodologies to better understand students' conceptual difficulty and pathways to promoting thinking geographically?

It is in the light of these questions that a threshold concepts framework seemed worth investigating.
Methodology

Since this is a new area of study within secondary geography education I sought to adopt a theoretical approach to making sense of the possible applications of a threshold concepts framework to the task of developing geographical thinking. Because of the exploratory nature of the study, the conclusions I have drawn remain provisional and are offered tentatively.

I have also reflected on my own experiences of teaching geography and my own attempts at encouraging geographical understanding and getting students to think geographically.

A brief outline of the threshold concepts approach

A Threshold concept can be considered as akin to a portal, opening up a new and previously inaccessible way of thinking about something. It represents a transformed way of understanding, or interpreting, or viewing something without which the learner cannot progress. As a consequence of comprehending a threshold concept there may thus be a transformed internal view of subject matter, subject landscape, or even world view.

(Meyer and Land, 2006)

Meyer and Land (2006), two key theorists within the threshold concepts approach, have identified the following characteristics of a threshold concept: it is likely to be:

- Transformative: causing students to perceive the subject differently. It can also involve a 'transformation of personal identity, a reconstruction of subjectivity.' This can also include an affective component such as a shift in values, feelings or attitude.
- Probably irreversible: once crossed it is unlikely to be forgotten or unlearned.
- Integrative: in that it ‘exposes the previously hidden interrelatedness of something’.
- Possibly bounded: the conceptual space occupied by the threshold concept has a boundary, often one that defines where the disciplinary boundary itself might lie.
- Potentially troublesome: there are barriers to understanding that can take a variety of forms and that have the effect of delaying, frustrating, limiting or possibly preventing understanding.

Troublesomeness results in students not “getting it”

Possible sources of troublesomeness are varied and numerous. They include the idea that:

Knowledge can appear to students as ‘counter-intuitive, alien (emanating from another culture or discourse) or incoherent’ in that there appears to be no organising principle involved.

Knowledge can be quite ritualised, sometimes inert, or conceptually difficult knowledge or tacit knowledge. The difficulty inheres in the concept itself but possibly in the learner or in the social context (Cousin 2006).

A Threshold Concepts approach also understands a discipline as more than just a bundle of concepts (Perkins, 2006). Each discipline is characterised by a distinctive episteme. An episteme is ‘a system of ideas or way of understanding that allows us to establish knowledge... manners of justifying, explaining, solving problems, conducting enquiries, and designing and validating various kinds of products or outcomes’ (Perkins 2006, p42). However, this is often tacit knowledge hidden from view from the student.

Additionally the threshold concepts view represents a form of social constructivism, it draws on social learning perspectives such as Lave and Wenger's (Wenger, 1998) communities of practice. It suggests that learning and the development of understanding involve a transfiguration of thought, but also a transfiguration of identity.

It draws on conceptual change models of learning. Misconceptions and troubled conceptions are understood within the context of domain-specific knowledge. So, for example, geography and geography education would be understood to have their own understandings of conceptual difficulty, different to those of other disciplines. A particular strength is in its focus on holism and how webs of related concepts combine to promote (or hinder) understanding.
What were the research findings?

To begin to address these questions I adapted and applied a model developed by Davies and Mangan (2007). Although researched and theorised in the context of teaching undergraduate economics, the model is a useful analytical tool to begin to identify threshold concepts in other disciplines and other educational sectors.

The model is premised on a conceptual change approach. What distinguishes the conceptual change approach to learning is that it argues that learning can involve a fundamental shift or restructuring of existing knowledge or beliefs rather than merely seeing it as an incremental modification (Davis, 2001). In the light of new information and/or experiences, the student's existing conceptions are reworked and can be fundamentally altered or replaced. It makes use of Meyer and Land's (2006) definition of threshold concepts as having the characteristics of being transformative, irreversible, integrative, bounded and potentially troublesome.

Within the model three types of conceptual change are identified: basic, discipline and procedural (see Table 1).

**Definition and Examples of three types of conceptual change within Secondary Geography**
*(model adapted from Davies and Mangan 2007)*

<table>
<thead>
<tr>
<th>Types of conceptual change</th>
<th>Type of transformation and integration</th>
<th>Examples in secondary geography</th>
</tr>
</thead>
</table>
| 1. Basic                   | Understanding of everyday experience transformed through integration of personal experience with ideas from discipline. | **Differentiation** between:  
- voluntary/forced migration  
- natural/anthropogenic causes of climate change.  

**Coalescence** between:  
- powerlessness/exclusion  

Defined in terms of **relationships**:  
- place  
- river channel width  
- human-physical interactions  
- personal identity |
| 2. Discipline              | Understanding of other subject discipline ideas integrated and transformed through acquisition of theoretical perspective. | **Theoretical perspective applied through organising concepts:**  
(e.g. scale, sustainability, space, place, time, change, diversity, interdependence, interaction, causality, inter alia)  

Plurality of geographies |
| 3. Procedural              | Ability to construct discipline-specific narratives and arguments transformed through acquisition of ways of practising. | **Modes of geographical thinking:**  
(e.g. spatial, systems, process, dimensional, relational, integrative, particular/synoptic, critical)  

geospatial thinking  
GIS and maps |
Basic conceptual change

Basic conceptual change occurs when a new concept is derived from reworking prior understanding. This can be in one of three forms.

First, differentiation - an existing concept may be differentiated into two or more new concepts. In geography for example, students might come to differentiate a single concept of ‘migration’ into two new concepts – ‘forced migration’ as opposed to ‘voluntary migration’. This differentiation may result in their thinking in transformed ways in their everyday lives but also about policy and ethical issues associated with migration. Similarly, differentiating causes of climate change into natural and anthropogenic causes might quite fundamentally transform the way a student thinks about climate change.

Second, coalescence - if it is noted that two existing concepts amount to a distinction without a difference, the two can be collapsed into a single concept. A student who, in the context of studying development, uses two concepts to make sense of a group of people on the margins of a society, that of ‘powerlessness’ and ‘exclusion’, might come to realise that the two concepts are in fact interdefined. Powerlessness is the effect of exclusion from economic, political, cultural and social processes, or put another way, the exclusion is the withholding of power.

Third, a concept defined in terms of its properties may be transformed into a concept now defined in terms of relationships. A student who previously thought of ‘river channel width’ in simple terms may come to re-analyse the concept in terms of its relationship to velocity, gradient, rock type and rates of erosion. As a second example, instead of understanding a place as a point on the map, a student may come to understand place for example as a node in a series of relationships characterised by interdependencies, flows, processes and networks. Place viewed in this way is understood in terms of relationships rather than properties.

These types of basic conceptual change can have the effect of transforming the everyday common-sense experience of students by integrating these experiences with ideas from the discipline. These basic conceptual changes will often be associated with an enhanced, more specialist geographical terminology. They are opening up conceptual spaces and potentially ways of thinking that are more disciplinary in nature. However, the extent to which the student’s understandings will be related to whether the student is able to integrate these new concepts with other disciplinary knowledge and into their everyday lives.

These basic thresholds might not be easily negotiated due to troublesome knowledge or troubled understandings. Troublesome knowledge can come in a number of different forms. The concepts themselves might be difficult to understand, or it may become inert knowledge such as a concept that the student uses in the geography classroom but not outside of it. The knowledge may be alien in that it comes from a perspective that is in conflict with the student’s own. So, a student who has learnt that some immigrants were forced to migrate might still outside of the classroom engage in an anti-immigrant discourse because the new knowledge is in the form of inert or alien knowledge. Tacit knowledge in the form of the teacher’s tacit presumptions or the student’s misguided tacit presumptions, because these are not surfaced can also serve to keep conceptual change from transforming understandings. Also, new concepts might not be connected with others in the discipline or with ideas the student experiences in their lives.

Davies and Mangan (2007) suggest where new conceptions are defined in terms of relationships, the conceptual change is more profound and disciplinary ways of thinking and practising are more likely. Conceptions defined in terms of relationships between concepts have the effect of integrating the ways students engage with and understand a range of phenomena.

Discipline level conceptual change

The model presents discipline and procedural thresholds as two separate scales, however, in terms of generating disciplinary thinking they are interdependent. The extent to which a student has achieved conceptual change at these levels might define the extent to which they are thinking geographically.
“Discipline thresholds and their attendant procedures are required to reconfigure previously familiar problems or issues as amenable to the analysis developed by a subject community” (Davies and Mangan, 2007, p 714).

There are two levels at which the discipline conceptual change might operate. Note, these two levels are not shown in the model in Table 1. They are presented here to help to make sense of what might be involved in discipline conceptual change. At the first level, the student will become familiar with a particular organising concept (e.g. scale) and the ways it can be used to make sense of geographical problems. This is an iterative process that would likely take place over a student’s entire school career and would involve the teacher making manifest how the concept is being used each time to help organise understanding of an issue, place, topic, context or theme being studied.

The second level involves using a number of these organising concepts simultaneously to make sense of the world. These concepts when used together characterise geographical thinking. It is when they are used in combination that they provide a unique and powerful disciplinary perspective on the world. Many of these concepts are also interdefined. For example, understanding place arguably depends on conceptions of space, scale, interdependence, interaction, time. Understanding sustainability will depend on conceptions of scale, time, change and many other concepts such as limit, capacity, exhaustion and so on. Each of these concepts transforms and integrates our understanding of related concepts.

What is involved in crossing this discipline threshold is therefore the ability to understand not only the web-like, integrated nature of many of these concepts but also how to employ them in combination to make sense of a problem geographically.

Procedural knowledge also helps in the identification of a deeper structure that may be present in the problem itself. To the extent that a set of disciplinary concepts and associated procedures exist in relationship to one another, they constitute what Perkins (2006) has termed the episteme (or way of knowing) in the discipline.

Procedural level conceptual change

Procedural level conceptual change can have the effect of transforming and integrating ways of practising within the discipline that enables the construction of discipline-specific narratives and arguments. It is being suggested that when certain types of procedures are applied in concert with the discipline’s integrative organising concepts that the thinking is geographical. Often these forms of thinking are cued by the way the organising concepts themselves have been theorised or understood. For example, in geography the idea of scale cannot easily be separated out from the concepts place and space (Lambert and Morgan 2010, p97). This suggests that in applying these conceptions our thinking must of necessity be integrative. Also, it is often relational. For example, space has been theorised in one sense as being continually constituted through socio-spatial relations, being seen as a product of social, cultural, political and economic relations (Hubbard et al. 2002, p13-14). This example suggests thinking geographically must entail thinking in terms of relationships; a relational thinking. Employing geography’s organising concepts such as time, change, interaction and causality often involves thinking not only in terms of relations, but also in terms of processes, and systems. These are ways of thinking that make a complex reality more amenable to understanding and representation.

I want also to make a case for geographical enquiry being a threshold. Geographical enquiry is something that teachers often view as an approach to teaching and learning rather than an essential procedure students need to be capable in (Roberts 2003). If students are to develop the ability to critically make sense of the world, it is as much their ability to frame and pursue critical questions (a procedural knowledge) that counts. There is a difference between enquiry more broadly and a critical geographical enquiry. The latter is more likely to frame its questions through a conceptually-framed geographical lens (i.e. using disciplinary conceptual knowledge). The procedural threshold to be negotiated therefore is the ability to independently or in co-operation with others both structure and pursue to conclusion a sequence of enquiry that will yield useful (and hopefully critical and personally empowering) geographical understandings. Enquiry is associated strongly with constructivist theories of learning and is viewed as a method to engage students in active learning. Its association with constructivism should be a reminder to us that it is a crucial component of any view that sees students as independent active constructors of knowledge.
What are the implications of these findings?

The threshold concepts approach holds a number of implications for both curriculum and pedagogy:

- It positively re-establishes a balance and a dialogue between the school subject and academic discipline that allows each to retain its own constituency but to mutually serve and enrich each other.
- It proposes a democratisation of knowledge within the teacher-pupil relationship especially as regards the teacher making the geographical episteme overt. A transactional curriculum inquiry is seen as offering a transcendence of teacher-centred or student-centred approaches. Within this the role of the teacher is seen to include a concern with all the factors that are hindering progress, these include identifying cognitive, motivational and affective factors as well as the variety of ways that knowledge can be troublesome. The teacher understands too that learning is an iterative process akin to a journey that is unlikely to be linear, is most probably recursive as learners negotiate thresholds, and that will involve a transfiguration of identity as well as thought.
- Progression within the curriculum is likely to be conceived of in terms of progression in geographical thinking rather than merely in terms of coverage of deepening skills, concepts and content. This requires flexibility in sequence and gives over more control to the teacher in making professional judgements about where next to take the learning journey.
- New forms of assessment are indicated too – ones that in formative ways assess both the qualities of learners but also the nature of the understanding, the modes of reasoning or explanation and the ability to construct discipline-specific narratives and argument.

What further research will be necessary/useful?

The aim of this research study has been to outline in broad scope what the potential applications of a threshold concepts approach might be within geography education. I would argue that the potential is great and the possible applications exciting. However, a number of lines of enquiry would need to be pursued before the apparent merits of the approach could be confirmed. The research questions that strike me as most important in the geography education context include:

- establishing a methodology through which the identification and existence of threshold concepts in geography can be established
- investigation of the nature of these threshold concepts and the difficulties encountered by students in negotiating them
- exploration of pedagogic practices and learning environments that induct students into the ways of thinking and practising and the organising frameworks of the discipline
- investigation of learner journeys in coming to think geographically
- how can progression in geographical thinking be assessed?
- understanding variation in the ways that students negotiate thresholds in understanding
References:


Please note:

This paper is a summary report of research conducted and submitted in partial fulfilment of an MA degree in Geography Education awarded in 2010 by the Institute of Education, University of London. A full transcript of the original research is available on request from the author. A copy of the MA dissertation is also available in the Institute of Education library.

Contact details:

Jonathan Slinger
Friends’ School
Mount Pleasant Road
Saffron Walden
CB11 3EB

Email: jonathanslinger@friends.org.uk