

Threshold Concepts: Informing the curriculum

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Introduction

Threshold concepts are defined by Meyer and Land (2003) as those concepts that are held to be central to the mastery of a discipline; students must grasp these concepts before they can move forward significantly. When a threshold concept is grasped, that is, when understanding is robust, the learner will see, know and behave quite differently within their discipline. To put this work in context, the idea that there are likely to be threshold concepts in all subject areas grew out of a national research project entitled ‘Enhancing Teaching-Learning Environments in Undergraduate Courses’ (ETL) carried out in the UK between 2001 and 2005. The project sought to develop subject-specific conceptual frameworks that would influence the quality of student learning. There was a focus on developing not only generic ways of thinking and practising, but also disciplinary skills, and a focus on concepts and ways of thinking that students find difficult, particularly when they act as thresholds to further learning.

During the past decade, the idea of threshold concepts has led to significant debate that has captured the interest of an ever-growing international community of teachers in higher education. In our experience, it has challenged and drawn in teachers who were not previously engaging in faculty development opportunities in their institutions. The reason for this may lie in the fact that the identification of threshold concepts, and the implications for curriculum design, place the disciplinary experts centre stage.

This chapter will highlight certain common characteristics of threshold concepts and demonstrate how we can use these to inform curriculum design. It looks at what the student must do, and what we as teachers must do, to succeed. The chapter will examine in-depth one case study, which monitors students’ journeys as they are transformed by the grasping of a threshold concept.

The Nature of Threshold Concepts

Teachers have long known that there are certain concepts that students find difficult but must grasp in order to progress in a subject. Teachers have had their own ways of recognising and dealing with the challenges that this reality poses, but a language to discuss difficulties was not readily accessible. David Perkins, an International Advisor on the ETL project, began to address this issue with his groundbreaking work on barriers to learning, which contributed to the development of a useful vocabulary to help teachers (Perkins, 1999). He argued that there are some concepts that are difficult for

students to grasp owing to their counter-intuitive or complex nature. He refers to these concepts as 'troublesome knowledge'. Included in this work is the useful concept of 'tacit knowledge' which relates to what is known by an expert but not made explicit to others. This work, and his work on breakthrough thinking (Perkins, 2000), offers us critical clues as we consider the bottlenecks and barriers to learning that can act to prevent students grasping a threshold concept.

Meyer and Land (2005, 2006a, 2006b) make use of a powerful metaphor for threshold concepts, referring to them as 'conceptual gateways' or 'portals' leading to a previously inaccessible way of thinking about something. The authors describe a 'liminal space', an essential space that the learner must enter on their journey towards mastery. It can be an uncomfortable and challenging conceptual space, where knowledge may seem counter-intuitive and troublesome (Perkins, 2006). The discomfort can be due to the learner having to leave old understandings, and sometimes misconceptions, behind. Students enter the liminal space in the hope of progressing along the conceptual pathway, but they must take time to play with the knowledge, experiment with it, apply it, and struggle to resolve conflicts in their understandings. Cousin describes the liminal space as 'an unstable space in which the learner may oscillate between old and emergent understandings' (2006a: 4). She adds that to build robust understanding, the learner must be recursive – journeying back and forward across the conceptual terrain. Eventually, after engaging in considerable work, the learner may reach the conceptual gateway.

Drawing on a number of disciplines, Meyer and Land (2003, 2005, 2006a, 2006b) note that grasping a threshold concept, as defined by disciplinary experts, has certain characteristics. These characteristics include:

- the threshold concept is transformative, and allows further learning to proceed;
- the threshold concept is often irreversible. Once understood the learner is unlikely to forget it;
- within a discipline, the threshold concept is likely to have borders with thresholds in new conceptual areas;
- the threshold concept is integrative. It exposes the hidden interrelatedness of phenomenon;
- the threshold concept is likely to involve troublesome, and possibly counter-intuitive, knowledge.

The first two characteristics describe what results when a learner has significantly grasped a threshold concept and this success can be celebrated when achieved. The third characteristic holds out the promise of new and less predictable opportunities at the boundaries between concepts. However, the fourth characteristic clarifies a possible pathway, or process, by which we can help learners to reach the stage of grappling with the threshold concepts in the discipline. Here, much work has been done in the Irish context by Higgs et al. (2010) and is illustrated in the following case study. The fifth characteristic prompts us, as teachers, to ask what causes this troublesome-ness. In the case study which follows, the work of Diaz et al. (2008) in 'decoding the disciplines' has been invoked to encourage beginning teachers to be explicit about ways of thinking and teaching in their discipline.

Threshold Concepts and Curriculum Design

Significantly for teachers, the idea that there are threshold concepts within each discipline

has implications for curriculum design, pedagogy and assessment. Cousin believes, in contrast to transmitting vast amounts of knowledge which students must absorb and reproduce, 'a focus on threshold concepts enables teachers to make refined decisions about what is fundamental to a grasp of the subject they are teaching. It is a less is more approach to curriculum design' (2006a: 4). If curriculum, pedagogy and assessment are designed to focus on the connections associated with one conceptual gateway, then a threshold concept can be grasped. Building on Cousin's statement, and focusing on the integrative nature of threshold concepts, Higgs believes teachers should be able to make refined decisions on what is 'fundamental to a grasp of the interconnectedness of disciplines and domains' (2007: 97).

The Affective and Cognitive Domains

Cousin (2006a) challenges the assumption that it is always the threshold concept itself that is troublesome. She believes the difficulty of mastery is not separate to the learner and their social and emotional context. She refers to the affective nature of learning and cites difficulties and anxieties students can experience as they undergo conceptual transformations in the liminal space. As in Vygotsky's (1978) 'Zone of Proximal Development', what the teacher does to assist the learner in this space is crucial. The case study that follows illustrates the importance of both the affective and cognitive aspects of moving towards mastery. Most teachers would agree that not only the student's cognitive ability but also his/her attitude to learning is of key importance. Students must be primed to learn – and if not ready, the opportunity may pass them by; they may remain pre-liminal.

More recently, as the debate has evolved, researchers are suggesting that the liminal space is a good place to be. For example, teachers of art say that they want their students to remain in the liminal space, where creativity is rife. It is where the students are most challenged and highly creative work can result (Land, 2011).

Building Students' Capacities to be Integrative

In higher education, discipline experts design learning opportunities, including assessment, in an attempt to reward what is valued in the discipline, and to lead the student through the transformative conceptual gateways. However, we, as teachers, are temporary guides. For this reason, it is important to help the learner to develop capacities to engage and thrive in liminal space, and to succeed in crossing future thresholds without a high level of teacher assistance.

A key capacity for learners is that of integrative thinking and learning. A significant body of work emerged from the Carnegie Foundation for the Advancement of Teaching project 'Opportunities to Connect', reported in a classic paper, published by Huber and Hutchings (2004) and culminating in reports by Huber (2006), Hutchings (2006), Gale (2006) and Miller (2006). This work inspired the Irish Integrative Learning project which encouraged the work of teachers who were intentionally building students' capacities for integrative learning. Their work was documented in an edited collection (Higgs et al., 2010) and informs the work of the case study which follows.

Resulting from these studies, the attributes and habits of mind which characterise the integrative learner have been recognised, and inform the case study. In summary, integrative learners:

- understand something of their own learning processes;
- fit fragmentary information into a 'learning framework';
- ask probing questions to help achieve their learning goals;
- monitor and reflect on their own efforts;
- ask for help when needed.

These are the very attributes needed to survive and thrive in the conceptual liminal space.

Threshold Concepts in Practice

The detailed case study that follows illustrates the often subtle and complex nature of encouraging learner transformation. In this study, the curriculum is designed to encourage postgraduate students, who tutor undergraduate students, to both grasp and teach the threshold concept of what it is to think like an historian. The intentional teaching for integrative learning, together with a decoding the disciplines approach, allows the tutors to make explicit what is becoming tacit knowledge to them. This in turn allows them freedom to teach in a different way to the way they themselves were taught. The curriculum is designed to encourage connections with neighbouring disciplines, to help both postgraduate tutors and undergraduate students to see the interconnectedness of phenomenon and build capacity to be integrative thinkers and learners. The inclusion in the curriculum of the online discussion, analysed below, provides the evidence of liminality and emerging understanding.

Case Study: Making historical thinking explicit in the Teaching History Seminars at University College Cork

For many undergraduate students, historical thinking is counter-intuitive as it requires not only the close reading of historical texts and artefacts, but also evaluating judgment based on the acknowledgement of the past on its own terms. These dispositions are crucial to historical thinking. Postgraduate teaching assistants have been primed for their teaching of undergraduate students by past experiences of being a student themselves. In this case study, drawn from a 'blended' (online and face-to-face) *Teaching History Seminars* series at University College Cork, online teacher discussion is selected to expose liminal moments between graduate teaching assistants' 'student' selves and their emerging 'teacher' selves. Online reflections, posted over an academic year (October 2011 to May 2012), by ten postgraduate teaching assistants (tutors), elucidate their contextual use of emerging professional wisdom within their teaching practice. Such intentional awareness, seldom made explicit, is central to the process of becoming a professional historian.

'Decoding' historical thinking

Historical thinking broadly constitutes a set of attitudes and practices most pertinent to the working lives of professional historians (Wineburg, 1991; Foster and Yeager, 1993; Epstein, 1994; Foster, 1999; Paxton, 1999; Wineburg, 1999; Barton, 2001; Seixas, 2004; Seixas and Peck, 2004; Simon, 2005; Bryant and Clark, 2006; Yilmaz, 2007; Lévesque, 2008; Endacott 2010; Fischer, 2011; Rantala, 2011; Chinnery, 2012). This concept is best understood as a 'rational reconstruction' of the thoughts of historical agents. It requires recognition that, because individuals are bound by space and time, we cannot fully

understand the motivations of historical agents by applying contemporary standards and attitudes (Bryant and Clark, 2006: 1042).

The composition of historical thinking, as Fischer has recently argued, should, 'allow for a translation between the language of academic history and the language of history pedagogy' (Fischer, 2011: 15). The *History Learning Project*, at the University of Indiana, Bloomington, has pioneered an approach to scaffolding disciplinary knowledge and critical thinking known as 'decoding the discipline' in history education. The rationale for a disciplinary decoding approach can be succinctly expressed as follows: 'When faculty express concern about the inability of students to do the work in a history class, the problem may not be a lack of the component skills, but rather that most of our students do not understand what historians do' (Díaz et al., 2008: 1218). Here, the 'doing' of history is thought of as a set of teaching and learning performances. Ideally, such performances should holistically incorporate cognitive and affective dispositions. Increasingly, the Indiana research group are concerning themselves with the affective domain in history education which has been so little studied to date (Middendorf et al., in press). 'Decoding' underpins the *Teaching History Seminars* at Cork. In Britain, in a similar approach, the *Hidden Histories* project, a joint initiative between University College London and the University of Trier in Germany, explicitly identifies ethical standards and empathetic dispositions as fundamental qualities required to conduct oral history research. It is worth noting that Nyhan et al. (in press) integrate cognitive and affective dispositions in their history research practices.

Method: Exposing historical thinking through online teacher discussion

Fairclough et al., (2003), writing on the discourse of citizenship, stress that a particular text, interview or participatory event is oriented to by its participants not in isolation, but as a part of an intertextual chain or network of texts and events. Any communication people inevitably draw on, anticipate and respond to, particularly social and institutional practices, involves them in an interdiscursive process of creatively drawing on the potential range of established 'Discourses' (ways of representing the world from particular perspectives), 'Genres' (ways of acting and interacting with other people, in speech or writing) and 'Styles/Voices' (ways of identifying, constructing or enunciating the self). 'Recontextualising' principles associated with different fields or networks of practices, such as governmental, academic or public sphere, fundamentally condition how a type of text or event is transformed into others in flows along chains and through networks. In the light of these categories, the value of using discourse analysis, as a research approach, in the context of this case study, is in highlighting how tutors' narratives may only be fully understood within a wider semantic chain of utterances, situating both tutors and students within the curriculum and the educational institution which, in turn, conditions the nature of their respective discursive formation.

In the broadest sense, any analysis of online behaviour that is grounded in empirical, textual observations can be referred to as computer-mediated discourse analysis. The basic methodology of computer-mediated discourse analysis is described by Herring (2004) as language-focused content analysis, supplemented by a 'toolkit' of discourse analysis methods. As in the more general practice of discourse analysis, the methods employed can be quantitative (involving coding and counting) or qualitative (content analysis). The former can resemble classical content analysis, but a broader spectrum of approaches is also included. Herring lays out a five-step process that resembles that for classical content analysis:

1. Articulate research question/s;
2. Select computer-mediated data sample;
3. 'Operationalize' key concept/s in terms of discourse features;
4. Apply method/s of analysis to data sample;
5. Interpret results

(2004)

These criteria guided the method adopted in the present case study.

Articulating research question/s

An appropriate computer-mediated discourse analysis research question displays four characteristics:

1. It is empirically answerable from the available data;
2. It is non-trivial;
3. It is motivated by a hypothesis;
4. It is open-ended.

The *Teaching History Seminar* at Cork encouraged history tutors to identify a challenge in their teaching that they could reasonably attempt to change through a teaching intervention of their choice. In order to expose historical subjectivity, tutors were initially encouraged to narrate their earliest memories of engaging with history. Throughout the study graduates were asked to reflect on the following decoding questions:

- What do historians do?
- As tutors, can you see connections between your experiences of history and what you are researching now?
- As tutors, can you describe relationships between your research and your teaching of history?
- Has your idea of history changed through your teaching of it?
- What is the role of Public History in engaging interest?
- How can we make students more receptive to thinking historically?

These moderated questions were phrased to promote a constructivist approach to learning and teaching whereby the subject (teacher and student) were acknowledged as comprising a central role in the co-making, adapting and refining of the historical contexts they were encountering through documentary sources. This scaffolding approach is intrinsic to exploring the dimensions of historical thinking which probe for context (motives of historical agents and their access to knowledge). It acknowledges that the passage of time limits the ability to understand historical agents' actions because our access to information about the influences on those actions diminishes over time (Bryant and Clark, 2006: 1044).

Selecting the data sample

The data sample in this study is drawn from the blog which was part of the project. In the *Teaching History Seminar* blog, 10 postgraduate tutors participated in the blog's online discussion. The research data includes 70 online posts, comprising 11,119 words of text.

The blog was visited 337 times from October 2011 to May 2012. Although the course was blended, is it only the online discussion threads which are subject to analysis here. This seminar discussed four themes:

1. Decoding the discipline of history;
2. Disciplinary identity and selfhood;
3. Professional values of the historian;
4. History in education.

Face-to-face seminars were deliberately positioned at six-week intervals, during the academic teaching periods, in order to encourage tutors to tease out and critique their individual and collective practices through peer online discussions. The purpose of this process was to hold tutors in a liminal space while they developed their emerging disciplinary teaching philosophies (Cousin, 2006a and 2006b; Land, Meyer and Baillie, 2010).

‘Operationalize’ key concept/s: time required to process activities

Through blog postings, a discourse on historical dispositions, grounded by praxis, was given space, over time, to emerge from interactions between the postgraduate tutors. Here, intertextual responses between online posts helped to condition meaning-making. The configuration of concepts, mediated by blog posts, aligned with the observation that the greater the expanse of time and of processing activities between the use of a current text and the use of previously encountered texts, the greater the mediation (Abushihab, 2010: 144).

Apply method/s of analysis to data sample

Disciplinary decoding, adapted from research at the University of Indiana, became the guiding principle of the *Teaching History Seminars* in the School of History at University College Cork. The *History Learning Project* at Indiana, in focusing on a history department’s ‘decoding’ its teachers and students’ understanding of the discipline, has argued that it is only by making explicit the tacit processes of historical performances that disciplinary understanding can be made fully intentional (Díaz et al., 2008).

To develop historical thinking, students require a battery of critical skills such as the ability to weigh past meanings, perspectives, traces, accounts, and interpretations. Such analysis permits creative, inferential thinking to ‘bridge the gaps’ in our fractured knowledge of the past (Bryant and Clark, 2006: 1042). The pioneers of teaching historical empathy, Ashby and Lee stress the importance of peer group interaction (1987: 85-86). Mentoring historical thinking requires sufficient competence in the context before identification exercises. Teachers often rush from one subject to another without giving students the chance to deepen their knowledge, with the help of the peer group, or without giving them a chance to see the past from the perspective of the historical agents. The reason for this may be a crammed curriculum, but also the thinness of the tradition of teaching empathy in formal educational systems (Rantala, 2011: 69).

Historical thinking draws on all available evidence, including competing accounts, to consider alternative, and often contradictory, perspectives. To the novice, primary sources document the ‘facts’ of history and are therefore not subject to analysis or interpretation (Díaz et al., 2008: 1213). Unwillingness to take risks, arising from a lack of confidence, is a significant bottleneck for the novice historian:

Lacking both the experience and the confidence of their instructors, many history students are understandably nervous about claiming to understand the meaning in the words or actions of someone in a very different era.

(Díaz et al., 2008: 1215)

Most first-year students initially hold to a dualistic world-view before transitioning to multiplistic and relativistic thinking (Perry, 1968,1999; Kurfiss, 1988; King and Kitchener, 1994; Baxter Magolda, 2002; Clinchy, 2002; Erickson, Peters and Strommer, 2006). Judicious risk-taking and imagination, essential for holistic historical thinking, are habits of mind intersecting domains of cognition and affect (Díaz et al., 2008: 1215). Lack of experience, in a discipline, is a bottleneck:

Students also must accept that sources are created by human beings and are as complicated as life itself. Faculty expect students to re-create imaginatively the cultural context in which such artefacts were produced and to re-create the meanings and perspectives of the people who produced them.

(Díaz et al., 2008: 1214)

At University College Cork, first-year tutors, teaching medieval history, intentionally encouraged students to make connections between history and disciplines such as archaeology and English literature where artefacts and period literature are studied in their disciplinary contexts. The following representative analysis illustrates how 'doing' of history is performative:

The first textual extract is taken from an early intervention.

Text 1

Posted by postgraduate tutor A at 4:21 pm on Nov 18, 2011

Hi James, On thinking historically in tutorial groups - I tried this week by getting the students to consider three different arguments/interpretations of 'Who was buried at Sutton Hoo?' and I think it worked quite well for some of the students. I showed them slides an Anglo-Saxon map and three different primary sources from the period which I knew had been used in historical debates on this topic. Some of the students came up with interpretations using these - i.e. they used a passage from Bede [first English historian] about King Raedwald [of East Anglia], the location of Sutton-Hoo on the map, evidence of Pagan ship burials from *Beowulf* [Anglo-Saxon epic poem] Pagan artefacts and Christian elements at Sutton Hoo [Anglo-Saxon ship-burial] to suggest it might have been the burial of this particular king. I think (hope!) they could see how different evidence and different disciplines can be used to form a historical argument, and it hopefully helped them to think historically!

Response from forum moderator at 5:00 pm on Nov 18, 2011

J.C. [a postgraduate tutor] raises two valuable considerations in thinking about the learning and teaching of History: 1. The role of teacher as role model -- offering not just information, but an implicit value-system -- what historical values do we model? 2. The value of being a healthy sceptic in the selection

and employment of sources in the construction of an historical argument -- is healthy scepticism valued enough? How is it manifest? -- perhaps in asking, how do we know about a particular past? -- how reliable is the evidence selected? The medieval world is a good example where all sorts of sources need to be used because of the lack of solid evidence in documents alone -- the further back in time we go then the more difficult it gets to reconstruct its particular 'thought world' -- perhaps it is here we need to foster the healthy historical sceptic!

To make 'decoding' visible, the textual extract is coded by discourse type modified through social practice.

Description (Text Analysis)	Interpretation (Discursive Type)	Explanation (Social Practice)
<p>Factual: the postgraduate tutor describes an initial introduction of a learning activity introducing novice historians to different types of historical sources. The tutor asks questions to promote a judicious discernment regarding the value of using different sources.</p> <p>Confidence: the tutor systematically discusses the chosen teaching intervention in an assured manner.</p> <p>Conversational: the tutor's opening salutation to the moderator displays an assured informality respectful to the moderator and peer group.</p>	<p>Legitimacy: the postgraduate tutor authoritatively describes the processes involved in setting up the learning intervention and cursively suggests how historical thinking can be worked out through the processes of discussion and dialogue within a group setting.</p> <p>Insider language: the tutor's post discusses a medieval history curriculum within a peer-reviewed forum where there is an implicit assumption that contributors will not require explanation. There is a tendency towards abbreviation, subsequently edited through parenthesis.</p>	<p>Learning as performance: the tutor structures an initial learning intervention on historical thinking (enfolding historical thinking) around the selection of appropriate source material and suggests how historical knowledge can be mediated through discussion.</p>

Table 1: Analysis 1

In this analysis, the interpretation component connects interpretation (discursive types) and description (text genres). The explanation component links interaction to the social action (practices) or the modalities drawn upon during interaction. It is through the explanation, that social practices are unravelled (Ng'ambi, 2008: 35).

The tutor subsequently noticed that many first-year undergraduates, despite being familiar with source material from other disciplines, had difficulty recontextualising these documents as historical sources without the tutor's explicit intervention. This response is paradigmatic of general responses made by the tutor cohort. It aligns with findings from the *History Learning Project*, at the University of Indiana:

students who have been led to see history as the chronicle of elites and of world-altering events have difficulty in conceiving of literary sources, pictures, maps, diaries, or songs as legitimate sources for studying history.

(Díaz et al., 2008: 1214)

The *History Learning Project* team at Indiana have discovered that while professional historical writing is predominantly narrative in form, novices of disciplinary history find difficulty comprehending how historical knowledge is produced and crafted (Shopkow et al., in press). A similar conclusion can be drawn from the experience of the *Teaching History Seminar* series at Cork.

To translate historical thinking, in a classroom context, it is recommended that a teacher pose a puzzling or paradoxical situation to which students may initially respond by sharing opinions and ideas (Foster, 2001: 175). The following representative textual analysis illustrates a tutor's 'decoding' of a disciplinary performance by judiciously guiding students through the labyrinth of intention and argument emerging from a close reading and questioning of a primary historical source in translation.

The second textual extract is taken from a later intervention.

Text 2

Posted by postgraduate tutor B at 4:45 pm on Jan 19, 2012

One approach that I found useful to move the students away from the political narrative was greater analysis of a primary source. In one instance we took a document dealing with Pope Urban II's announcement of the First Crusade in November 1095 [a military expedition by Roman Catholic Europe to regain the Holy Lands taken in the Muslim conquests of the Levant during the seventh century]. Ironically, this unlike other literary sources such as *Beowulf* [Anglo-Saxon epic poem] was very political in nature. Yet, I attempted to bring in elements of cultural and social history and combine them with political history by first asking them why there was a crusade; Jerusalem had fallen to the Muslims. Secondly, why call a crusade in November? What was special about this time of the year in relation to the religious calendar? They answered that it was Advent [in Christianity, a liturgically observed season before Christmas Day celebrated on December 25] and I explained that the Pope was linking the idea of religious war with a time of fasting and prayer. This quickly got a lively discussion going and I think the students could see that there was indeed a cultural side to history, i.e. the belief system that existed in medieval time. Finally, I asked them why call a crusade in November, but not launch it? They quickly answered that it was too cold and so we discussed the social implications of going to war in medieval times, which helped stimulate further debate in the class. I followed this template of linking the various frameworks for studying sources for the next few classes and it seemed to work well.

Similar to the first example, the textual extract is coded by discourse type modified through social practice.

Description (Text Analysis)	Interpretation (Discursive Type)	Explanation (Social Practice)
<p>Factual: the postgraduate tutor describes a sustained learning intervention introducing novice historians to critiquing primary historical documents. The tutor asks questions to promote judicious discernment of a document's content and subject matter.</p> <p>Confidence: the tutor systematically discusses the chosen teaching intervention in an assured manner.</p>	<p>Legitimacy: the postgraduate tutor authoritatively describes the processes involved in setting up the learning intervention and discusses how historical thinking can be worked out through the processes of discussion and dialogue within a group setting.</p> <p>Insider language: the tutor's post discusses a medieval history curriculum within a peer-reviewed forum where there is an implicit assumption that contributors will not require explanation. There is a tendency towards abbreviation, subsequently edited through parenthesis.</p>	<p>Performing historical empathy: the tutor's guided intervention demonstrates principles intrinsic to historical performance, namely, empathetically mentoring students to interpret the words of historical agents as conditioned by the limits of their particular historical thought-world.</p>

Table 2: Analysis 2

Interpretation of case study results

To become authentic as disciplinary stewards, academic teachers need to experience their chosen discipline holistically not just as a cognitive field, but also one requiring a set of attitudes and beliefs about the discipline and about themselves as emerging academic teachers.

After a year of sustained reflection, postgraduate tutors who participated in the *Teaching History Seminar*, School of History, University College Cork, began to articulate authentic and increasingly nuanced understandings of historical empathy once awareness of their own developing historical identities had been articulated. Online peer review allowed discourse to emerge from the text rather than meaning being externally imposed. Most significantly, tutors' discourse revealed how historical understanding was in the 'doing' of history. Tutors understood debate and discussion as central to the mediation of historical knowledge. History's value system was perceived as involving engagement with research practices and dispositions. Computer-mediated discourse analysis exposed emerging teacher discourse.

At the conclusion of the *Teaching History Seminars* series tutors broadly advocated a research-focused teaching and learning curriculum intervention because of its potential to model authentic performances of historical thinking essential to professional historical studies. We concur with Rantala (2011), historian and teacher educator, University of Helsinki, Finland, who has observed that the planners of future curricula should have the courage to prune back the amount of content to be taught so that teachers might have more time to concentrate on 'the jewel in the curriculum/the threshold concept/skill' - the teaching of historical thinking.

Discussion and Conclusions

Dissemination, discussion and debate at four international conferences, and in many publications, have critiqued and expanded the original idea of threshold concepts, so that it has increased in sophistication, depth and breadth. Many forums, symposia and conferences have now stimulated academic staff to articulate the key, or threshold, concepts within their own disciplines. Although the work was originally carried out in the disciplines of economics, science and maths, the recognition of potential threshold concepts has spread across the disciplines, with engineering being particularly well represented (Foley, 2008; Quinlan et al., 2012). There are now significant research projects being carried out in Europe, North America and Australia (Flanagan, 2012).

Why have discipline experts, who have been sceptical about staff development initiatives, taken to the idea of threshold concepts? We suggest it is because it puts the ball back in their court where they are the experts. They know what students find difficult to understand. They design the curriculum that intentionally builds student attributes so that they may enter, survive and thrive in the liminal space.

One significant implication of this study is the need for a crucial paradigm shift in how educational institutions construct the notion of ‘the student’. Students inducted into disciplinary study should be regarded as disciplinary novices or apprentices, guided by disciplinary masters, and therefore full participants, from the outset, in the ways of *being* in their respective discipline or profession for the foundation of their studies. Too frequently students are kept outside disciplinary practices until they have earned the right to participate through a staged entry of testing and validation. Learning a new discipline or profession creates ontological shifts in student selfhood. Ideally, this involves entering into new processes of *being* (thinking and acting). To grasp the threshold concepts in a discipline, teachers must model not only the cognitive processes of disciplinary and professional knowledge, but they must also model processes of thinking and behaving in ways which make learning truly holistic. Learning a discipline or profession not only requires acquisition of specialist knowledge and a language in which to express this, but it also conditions approaches to evaluating and questioning how knowledge itself is constituted.

Sceptics have rightly asked ‘is the term Threshold Concepts a fad that will be forgotten in five years time?’ Our answer is this: the idea of threshold concepts is just that, an idea. It does not matter if the term is forgotten. The idea, and the ensuing debate, has deepened our understanding of the learners’ journeys and it has drawn in teachers who had not engaged in teaching and learning theory before. It has allowed some incremental changes in curriculum design that are real and lasting, and it has generated a critical mass of literature that will remain to inform those who wish to delve deeper.

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Response to

Threshold Concepts: Informing the curriculum

by David Pace, Professor Emeritus of European History, Indiana University.

Like many of today's critics of higher education, Bettie Higgs and James Cronin argue that college instruction needs to move its focus from the transmission of content to the introduction of students to the fundamental ways of functioning within a discipline. Drawing upon an impressive body of literature on the scholarship of teaching and learning, particularly Threshold Concepts and, to a lesser extent, Decoding the Disciplines, they convincingly articulate a vision of higher education. They advocate a disciplinary apprenticeship that involves not only cognitive learning, but also the incorporation of a new set of attitudes and beliefs. But, more importantly, they provide a path to the realisation of this ideal of academic initiation. The frameworks for postgraduate training that they describe provide a means for installing very different attitudes towards instruction within a new generation of academics. The *Teaching History Seminars* they describe provide a model for re-orientating new instructors' thinking from the conveyance of information to the inspiration of new attitudes towards both teaching and learning. The lessons described in this article are of particular interest to historians, but they can also provide a model for rethinking pedagogical preparation in any discipline.