Threshold Concepts:
Enabling Open Dialogue on Teaching and Learning within and across Traditional Boundaries?

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Threshold Concepts

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Where did 'Threshold Concepts' come from?

- 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 Courses – http://www.tlrp.org)

- It became clear to that certain concepts – 'threshold concepts' - were held by economists to be central to the mastery of the subject.

  (Meyer and Land 2003, 2005, 2006)

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ETL Project Key Concepts & Conceptual Framework

- **Conceptual Map of the 'inner' Teaching - Learning Environment**
  - Described as the whole set of teaching, learning support, assessment and administrative arrangements, as well as the facilities and resources provided within a degree course.
  - Particular focus was on those aspects to influence most directly the quality of student learning

- **Influences on Student's Learning**
  - Term was needed to cover not just approaches to studying, but also the thinking processes and subject-specific skills that staff were seeking to develop in their students. Deep approaches to studying which are well organised and applied with effort were used to indicate engagement with the courses being studied

- **Influences on Teaching and Pedagogical WTP's**
  - Designed to capture the 'goodness-of-fit' between the aims of a course and the teaching-learning environment and assessment procedures followed; 'constructive' indicates that the aims involve a focus on developing conceptual understanding and ways of thinking and practising the subject
  - .

- **Troublesome Knowledge and Threshold Concepts***
  - Particular value was seen in focusing on topics or ways of thinking that students find difficult, particularly when these act as a threshold to further learning. Examining these in relation to teaching and assessment provides a focused way of investigating influences on learning outcomes.

Constructive Alignment

> **Conceptual map of the 'inner' Teaching- Learning Environment**
>
> **Influences on Student's Learning**
>
> **Influences on Teaching and Pedagogical WTP's** *(Ways of thinking and Practicing in the Subject)*
>
> **Troublesome Knowledge and Threshold concepts**

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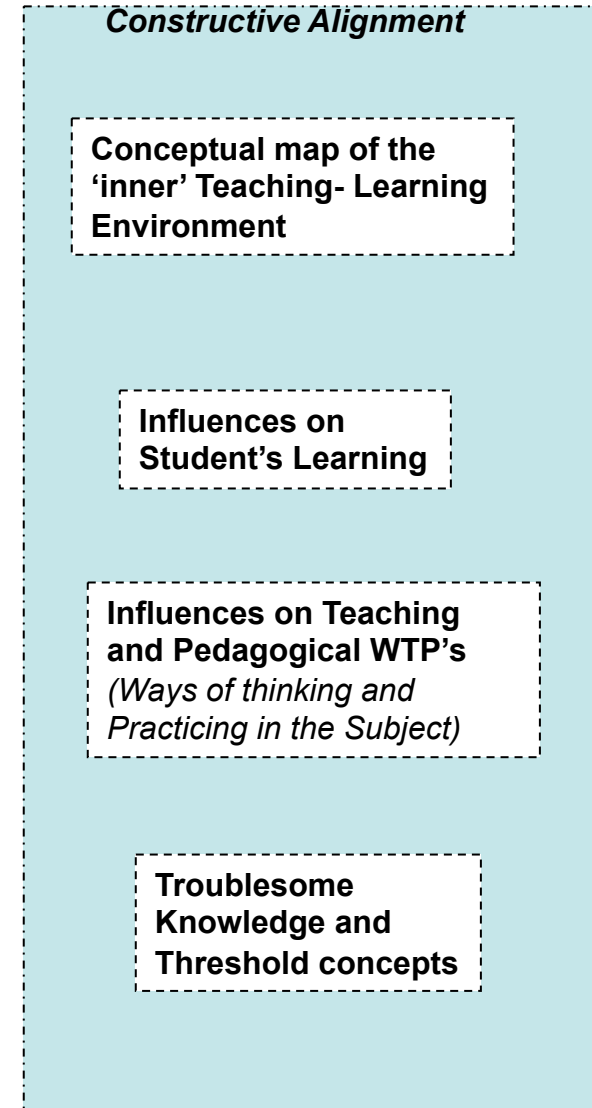
Concepts & Threshold Concepts

A concept - 'a unit of thought or element of knowledge that allows us to organize experience'

Source: Janet Gail Donald (2001)
'Learning to Think: Disciplinary Perspectives'

A threshold concept – 'represents a transformed way of understanding, or interpreting, or viewing something without which the learner finds it difficult to progress, within the curriculum as formulated'.

Source: Meyer & Land, 2003. In Rust, C. (ed.),
Improving Student Learning Theory – Ten Years On,
Oxford: OCSLD, pp. 412-424

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Learning experience of threshold concepts

A threshold concept - 'akin to passing through a portal, or conceptual gateway, thus opening up a new and previously inaccessible way of thinking about something'

Source: Meyer & Land, 2003. In Rust, C. (ed.), *Improving Student Learning Theory – Ten Years On*, Oxford: OCSLD, pp. 412-424

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A consequence of comprehending threshold concepts ....

The learner may experience a transformed internal view of subject matter, subject landscape, or even world view.

Such a transformed view or landscape may represent how people 'think' in a particular discipline, or how they perceive. apprehend, or experience particular phenomena within that discipline, or more generally.

Recognising threshold concepts

Attribute	Evidence
Transformative	Involves an ontological as well as a conceptual shift. The transformative character reflects the way in which threshold concepts can change a student's perception of themselves and the subject.
Irreversible	A threshold concept is often irreversible; once understood the learner is unlikely to forget it. This does not include subsequent modification or rejection of the concept for a more refined or rival understanding.
Integrative	It is integrative in the sense that it exposes the hidden interrelatedness of phenomenon. Making connections that were before this point hidden from view.
Bounded	A threshold concept also helps to define the boundaries of a subject area because it clarifies the scope of a subject community.
Troublesome	Likely to involve forms of 'troublesome knowledge' – 'that which appears counter-intuitive, alien (emerging from another discourse or culture), intellectually absurd or seemingly incoherent' (Perkins in Meyer & Land 2003, p.7)

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Threshold Concepts in the Disciplines

- Pure Maths – 'complex number, a *limit',* the Fourier transform'
- Literary Studies – *'*signification, deconstruction, ethical reading'
- Economics – 'opportunity cost, price, elasticity'
- Design – 'Spatial Understanding'
- Computer Science – 'programming', 'Y and Recursion'
- Exercise Physiology – 'metabolism'
- Law - 'precedence'

- Accounting - 'depreciation'
- Biology, Psychology - 'evolution'
- Politics – 'the state'
- Engineering – 'reactive power', 'spin'
- History – 'Asiatic Conceptions of Time'
- Comparative Religion– 'Biblical texts as Literary Texts'
- Plant Science 'Photoprotection'
- Health Science – 'Care'

Product Development as a Process – a Threshold Concept?

Attribute	Evidence
Transformative	The concept of product development as a process, defined in terms of core and enabling processes, rather than a function or a technical design task changes the student's perception of themselves and of the subject. To manage in this area requires process managers who can span and integrate a variety of areas of expertise
Irreversible	Seeing product development as a process, the student does not return to viewing the area as a function or a technical task, as they did before
Integrative	The scope of the core and enabling processes brings together a variety of discipline and functional areas to be managed
Bounded	Depending upon the context within which a new product is being developed, the detailed management task will differ. However, the scope of the core and enabling processes at the levels of the firm and of the project helps to define the boundaries of a subject area and clarifies the scope of the communities of research and practice
Troublesome	Seeing product development as a process is taken for granted by many practitioners. The associated knowledge is tacit, alien to disciplinary-bounded students, and conceptually difficult

Why are threshold concepts interesting …?

- Understanding the pedagogy of the subject we teach challenges us to make sense of what seems central and often difficult to grasp by most learners.

- A focus on threshold concepts enables teachers to make refined decisions about what is fundamental to a grasp of the subject they are teaching.

What happens when students don't really 'get it'?

- As one teacher of engineering put it, "that guy will pass his assessments and get his degree but he'll never **think like** an engineer."

What do you think ..?

- Is it possible to identify areas of your own teaching which might require the learning of threshold concepts?

- What parts of your curriculum tend to prove 'troublesome' to students?   What might account for the troublesome-ness of this knowledge?

Graham & Potter 2008   **Source**: Questions by Ray Land in Durham (2008)

Concept Mapping

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Discussion Question – for later

What potential has 'threshold concepts' to be an enabler and energiser of dialogue and inquiry into teaching and learning within and across traditional institution and disciplinary boundaries?

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