



Aalto University

Threshold concept

Group MUOTTI: Anu Bask, Markku Norvasuo ja Tiina Laatikainen

Think of time in your learning when you have had an "a-ha" moment



A-ha moments ...

- **Seeing the interconnectness of different theories working together**
- **Transformational**
- **Being able to dig deeper into a topic once you've had this "a-ha", being able to see what's going on**
- **Looking through a different lens**
- **Putting learning into context, seeing the implications**
- **Uncovering assumptions, seeing through others' lens, changing own perspective, seeing things differently**
- **Overcoming frustrations**

Threshold concept *in brief*

”The portals to understanding a discipline or field”

(Mayer and Land, 2003)

A concept represents a threshold if it leads to a qualitatively different view of the subject matter, often challenging existing knowledge

Threshold concept *in brief*

” A tendency among academic teachers is to stuff their curriculum with content, burdening themselves with the task of transmitting vast amounts of knowledge bulk and their students of absorbing and reproducing this bulk.”

(Cousins, 2006)


Threshold concepts are fundamental understandings that sit at the heart of a body of knowledge. Students need to 'get' them in order for core disciplinary knowledge to make sense. They are like a portal, opening up a new and previously inaccessible way of thinking. They can be challenging, troubling and finally transformative

(<http://scu.edu.au/teachinglearning/index.php/91>)

Threshold concepts are

Troublesome → Mastering threshold concepts often requires acquisition of knowledge that is troublesome

Transformative → Threshold concepts open up a new and previously inaccessible way of thinking about something

Irreversible → Threshold concepts are difficult to unlearn 

Integrative → Threshold concepts bring together different aspects of the subject that previously did not appear

Bounded → threshold concept will probably delineate a particular conceptual space, serving a specific and limited purpose

Reconstitutive → Learning from 'easy' to 'difficult'; mastery of a threshold concept often involves messy journeys back, forth and across conceptual terrain

Discursive → Crossing of a threshold will incorporate an enhanced and extended use of language

Liminal → threshold concepts may leave the learner in a state of 'liminality', a suspended state of partial understanding, or 'stuck place', in which understanding approximates to a kind of 'mimicry' or lack of authenticity

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<http://www.slideshare.net/ashleygasten/threshold-concepts-in-higher-ed-stlhe2015> 6

<http://www.slideshare.net/londonellen24/light-lunch-thresholds-workshop>

Threshold concepts in Academic Discipline

(Stokes et al., 2007; Tucker, 2012)

Discipline/Subject	Suggested Threshold Concept(s)	Reference
Economics	Opportunity cost; elasticity	Reimann & Jackson (2006)
Pure mathematics	Complex numbers; limits	Meyer & Land (2003)
Electrical engineering	Frequency response	Carstensen et al. (2006)
Statistics	Sampling distribution	Kennedy (1998)
Health care	Care; pain	Clouder (2005)
Law	Precedence	Land (2005)
Biology	Process, e.g., energy transfer	Taylor (2006)
Biology	Evolution	Taylor & Cope (2007)
Information systems	Information systems as social systems	Cope & Staehr (2008)
Computer science	Object-oriented programming	Zander et al. (2008)
Economics	Efficiency; market equilibrium	Dulleck & Tang (2009a;2009b)
Physics	Energy quantization; atomic structure	Park & Light (2009)
Doctoral research	Argument; theorizing; knowledge creation; analyzing & interpreting	Kiley & Wisker (2009)
Calculus	Limit; integral	Sheja & Pettersson (2010)
Information literacy	Systemic thinking, pattern perception	Blackmore (2010)
University teaching	Structural transformation (knowledge structures)	Kinchin & Miller (2012)



Threshold concepts and teacher (Cousins, 2006)

“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.”

“One important caution is to be aware that a threshold concept can be a form of disciplinary property and as such, its presentation in a curriculum may carry an inherent tendency to invite congealed understandings. This implies a curriculum design perspective that aims for a research-minded approach to mastery in which there is always space for questioning the concept itself.”

Think about ...

**What is the potential
threshold concept
in your course?**



Concluding remarks

“If we want to develop an understanding of the pedagogy of the subject we teach, we have to start somewhere and making sense of what seems central and often difficult to grasp by most learners, is a good place to begin our inquiry” (Cousins, 2006)

- A threshold concept is often irreversible; once understood the learner is unlikely to forget it
- Prerequisites needed for threshold concept
- Threshold is linked to student’s learning outcomes and every step of Benjamin Bloom’s taxonomy

Questions to think about:

- What are central to the mastery of your subject/ program
- What are your course’s subthresholds supporting the program’s one

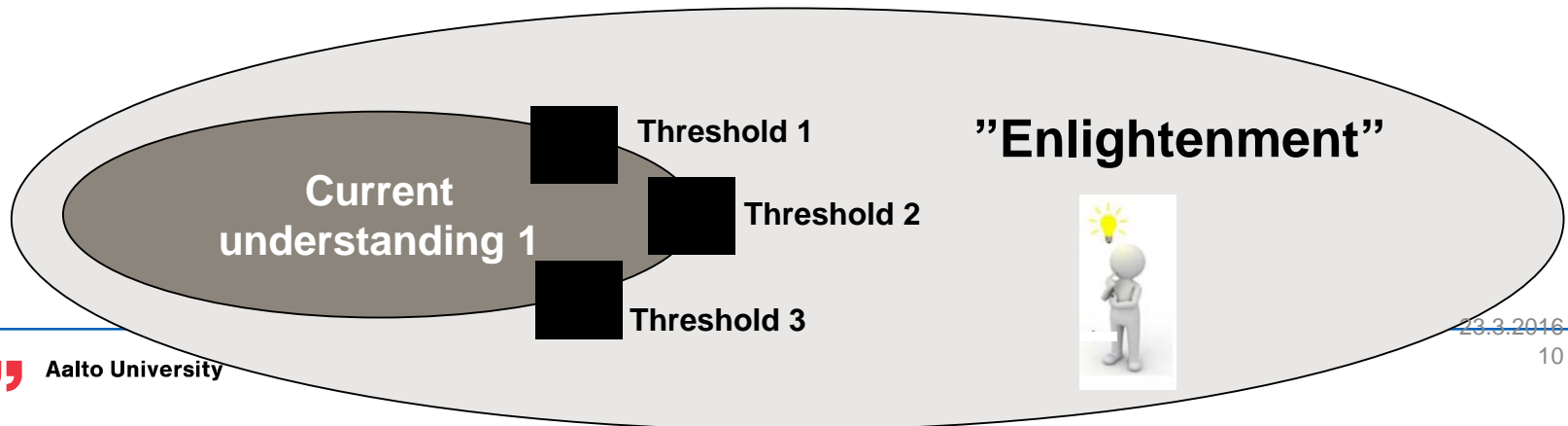


Figure: Threshold process (Bask, Norvasuo, Laatikainen)

Thank you

Anu



Markku



Tiina



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