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Emergent learning and threshold concepts in tertiary education

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‘Nettlesome knowledge’ and threshold concepts: An afterword

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A short overview

The title of this afterword derives from Peter Mudge’s contribution in this special issue devoted to threshold concepts (TCs). His paper focused upon the challenge faced when crossing frontiers without a map in pursuit of a more profound understanding of religious education and spirituality. He, in common with a number of authors of the range of papers, was concerned with the notion of troublesome knowledge that he perceived could be characterised as “nettlesome knowledge”, that is those “elements of knowledge that are deemed taboo in that they are defended against, repressed or ignored because if they were grasped they might ‘sting’ and thus evoke a feared intense emotional and *embodied* response” (Sibbett & Thompson, 2008, p. 229). Being stung into sensibility is at the heart of the identification of threshold concepts, for the pathway to learning is one that has a capacity to discomfort as the learner experiences cognitive dissonance.

Reducing cognitive dissonance is the task of good pedagogy and curriculum design, but only if it enhances powerful and substantial progress in learning (Walker, 2013). The efforts and energy of the authors of these varied papers, both in terms of disciplinary orientation and methodologies, can be said to be directed to acknowledging the centrality of careful and developmental curriculum design that has as its purpose student learning, whether in the physical sciences or the humanities. As well, a number of papers draw attention to teaching and learning issues. While Jonathan Scott in a footnote has observed that in useful and powerful ways TCs have contributed to curriculum design, their contribution to teaching methods themselves are less clear. This may be true of the physical sciences but there is ample evidence in the papers that the impact on pedagogy itself in the social sciences and humanities has been significant. The pedagogical consequences of embedding TCs are laid out by Ann Harlow and Mira Peter in their overview of the TLRI project that was the genesis of the conference from which the majority of these papers derived. The key question that the project addressed was in relation to how the introduction of TCs into *teacher-student discourse* and teaching practice impacts *student learning* at the tertiary level.

Of course, none of these papers suggest that tertiary students come to their university courses free of knowledge and experience in relation to their chosen subjects. A combination of prior socialisation, earlier educational encounters and culture will have already given them pre-dispositions to reflect on phenomena in a variety of ways; ways that may lead them to misunderstandings. Marcus Wilson’s paper on students’ and experts’ perceptions of the role of mathematics in physics provides us with an interesting and challenging example. He found that in teaching physics to physics and engineering students, students often adopted two, equally unhelpful, views of mathematics within physics.

> Students who are not strong in mathematics take the first view; they can assume that their lack of skill in mathematics will necessarily prevent them from understanding physics, and therefore they lack motivation in their studies. Some students who are strong in mathematics hold the second view; they can take the approach that their

> mathematics will carry them through the physics—that the physics doesn't add anything substantively new to what they know already. (p. 94)

He argues that both these views can hold students back from learning physics.

Similarly it may be argued that academic practitioners themselves may be captured by their own experiences and limitations. Nicholas Rowe and Rosemary Martin in writing of the transition of performing artists into academia through their engagement in postgraduate coursework proposed:

> While we may question the pedagogic strategies and academic responses that we encountered during our initiation into academia, underlying these were our own assumptions about what it meant to be an academic. These assumptions formed a threshold, or mental barrier to our understanding, which restrained both of us on our separate pathways into postgraduate research. (p. 26)

Marcia Johnson in examining the professional development of doctoral supervisors identified two TCs emerging from her research: talking to think: and developing self-efficacy. This identification has led to insights that could extend the content of supervisor professional development beyond those regulatory and compliance issues that so dominate what little preparation there is for doctoral supervisors who often carry the legacy of their own experience as the sole touchstone that can guide their practice.

A number of papers drew attention not only to the threshold concepts themselves[i] but also to their relationship to other ways in which concepts might be identified for the purposes of curriculum design. Tony Parker and Daniel McGill make a distinction between threshold concepts and what they identify as "key concepts". They consider *threshold concepts* to be *transformative* in that they radically challenge and change the students' approach to the body of knowledge associated with the discipline of an undergraduate engineering course, whereas a *key concept* is of an *associative* nature, in that it is closely aligned to, and supportive of, the threshold concept being developed. They see that it is possible to design a curriculum as a structured sequence of TCs arguing that at each point in the curriculum, a threshold concept is precisely specified, developed, and assessed within the teaching module. The required body of knowledge is linked to the appropriate TCs. The result is that emphasis is placed on understanding through the development of threshold concepts rather than on "wholesale coverage of a list of topics".

Kirstine Moffat and Anne McKim tackled the difficult and elusive matter of subjective interpretation in the arts and humanities. They identified 'subjective interpretation' as "a complex and crucial threshold concept in the arts and humanities. This multifaceted concept covers understanding the role and function of perspective, point of view, and voice in the critical appreciation and analysis of texts and other media" (p. 37). They believed that their students entered into their tertiary studies with a somewhat naïve and uncritical view of facets of interpretation and that 'subjective interpretation' could be constructed as a 'meta threshold concept' in that it serves as an umbrella to a range of interrelated contributing concepts. Their means of tackling TCs also included specific assessment tasks that gave students insight into their level of mastery and integration into their understanding of subjective interpretation.

An interesting issue arises in relation to planning for TCs when designing on-line courses. Mary Hedges examined embedding TCs in an MBA course that included a weekly online discussion forum that had two intended purposes: to develop engagement with the course content; and to explicitly enable the students to embed and apply key TCs to their professional lives. Early in the course, students were required to discuss specific questions relating the theoretical content to familiar experiences, "thereby focusing on the practice–theory link". By the end of the course, they had to relate theoretical content to both familiar and new contexts, thus "extending theory–practice links". An online reflective journal provided the opportunity to explore the 'practice–theory–practice' cycle that the students had to integrate into other assessment tasks. Keeping the online journal was compared to keeping a trip diary so that when students reviewed their early postings they would be able to estimate how far they had come and how much their understanding of theory and their emergent worldview had developed.

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[i] The TCs are not listed in this afterward as they have been fully treated in the range of articles.

Connecting to student learning

It is clear from this brief summary, of the range and variety of articles included in this issue dedicated to TCs, that there is a determination to enhance student learning through engagement with the students themselves, giving them a 'voice' in designing the apposite curriculum and indicating appropriate teaching strategies. In effect, the students are operating with their teachers in a form of pedagogical partnership (Cook-Sather, Bovill, & Felten, 2014).

In their advocacy for such partnerships Cook-Sather et al., suggest that such arrangements are themselves a threshold concept both for academic staff and students (p. xviii). They see partnerships for learning and teaching require an openness to the student experience and what it is like to be a learner in a tertiary course—learners who act not only as legitimate informants, but also as authors of their own learning engaged in new forms of participative inquiry. Radloff & Coates (2013, p. 29) have argued: "Students' engagement in education is an inherently human phenomenon, and as with any shifts in quality assessment change hinges on having academic and professional staff who can give life to new strategies and practices."

It has now been long noted that joining in participative inquiry in the context of universities is 'a struggle' (Levin & Greenwood, 2001). The contributions in this special issue take us into a new domain of student voice in higher education. Seale (2010) suggests the two most commonly cited purposes of student voice in higher education are those related to quality enhancement and assurance and academic staff development—both being of an instrumental rather than emancipatory and transformative in nature. Much teaching, in tertiary education has become fragmented and dominated by specific criteria and competencies, irrespective of context and the learning needs of the students. Approved templates for course outlines, assessment regimes, learning outcomes and the like are increasingly prescribed. Discretionary actions on the part of tertiary educators are, as a result, progressively more constrained, limiting their role to that of operatives. Knowledge is codified and routinised with little space for improvisation and elaboration and leaves little room for authentic dialogue in what Kemmis (2010, p. 17) refers to as "praxis-related research … developing an inquiry culture in a field setting".

By working, with their students, on the nature of TCs and the ways in which they can inform curriculum design and pedagogy it is clear that the contributors to this journal are truly engaged in 'praxis-related' research. Not only are students more deeply engaged and motivated, it is also clear that they are developing a greater enthusiasm for their own learning. In partnership with their teachers they are jointly taking responsibility for learning through an application of what Sambell, McDowell & Montgomery (2012) regard as meta-cognitive strategies in the form of critical analysis of their tertiary experience through self assessment, as is clearly manifest in the range of articles.

In summary, reading through these papers has produced a number of encounters with 'nettlesome knowledge'. Investigating threshold concepts requires not only tenacity and imagination but also a readiness to battle with 'dangerous ideas'. The process is a disruptive one that challenges the status quo where normally power and authority are beyond the grasp of students. In effect, the process reminds us that universities should and can be a safe place for unsafe ideas (Groundwater-Smith, 2007).

References

Cook-Sather, A., Bovill, C., & Felten, P. (2014). *Engaging students as partners in learning and teaching: A guide for Faculty.* San Francisco, CA: Jossey Bass.

Groundwater-Smith, S. (2007). Universities in the 21st century—the need for safe places for unsafe ideas. In P. Ponte & B. Smit (Eds.), *The quality of practitioner research: Reflections on the position of the researcher and the researched* (pp. 57–64). Rotterdam, The Netherlands: Sense.

Kemmis, S. (2010). Research for praxis: Knowing doing. *Pedagogy, Culture and Society, 18*(1), 9–27.

Levin, M., & Greenwood, D. (2001). Pragmatic action research and the struggle to transform universities into learning communities. In P. Reason & H. Bradbury (Eds.), *Handbook of action research: Participative inquiry and practice* (pp. 103–113). London, England: Sage.

Radloff, A., & Coates, H. (2013) Monitoring and improving student engagement. In S. Marginson (Ed.), *Tertiary education policy in Australi* (pp. 21–30). Melbourne, Vic, Australia: Centre for the Study of Higher Education.

Sambell, K., McDowell, L., & Montgomery, C. (2012). *Assessment for learning in higher education.* London, England: Routledge

Seale, J. (2010). Doing student voice work in higher education: An exploration of the value of participatory methods. *British Educational Research Journal*, *36*(6), 995–1015.

Sibbett, C., & Thompson, W. (2008). Nettlesome knowledge, liminality and the taboo in cancer and art therapy experiences: Implication for learning and teaching. In R. Land, J. H. F. Meyer, & Smith, J. (Eds.), *Threshold concepts within the disciplines* (pp. 227–242). Rotterdam, The Netherlands: Sense.

Walker, G. (2013). A cognitive approach to threshold concepts. *Higher Education 65*(2), 247–263.