

## Threshold Concepts in the Learning of Agriculture: Quality and Relevance for Curriculum Innovation

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Agricultural education in Brunei Darussalam is getting diminished despite the need for expansion and diversification from petroleum-based economy. Agriculture in schools is confronting the issues of quality education. But how do we address quality in learning in a prescribed curriculum? In pursuit of quality, this paper presents agricultural learning concepts responsible for higher levels of understanding, and how students arrive at this understanding.

This multicase study draws on data from secondary education students studying agriculture during 2009 – 2010. It uses the threshold concepts framework as an analytical tool for understanding students' learning and exploring their personal experiences based on interviews, questionnaires, and curricular documents. The methodological approach is phenomenological qualitative using four stages of Interpretative Phenomenological Analysis (IPA) supplemented with some quantitative analysis.

The threshold concept constituents discovered are very diverse ranging from skills, science, business, research and management; but 'planting' is the key. Eleven super-ordinate themes illuminated two stages of threshold understanding: 'planting and plant sciences' at the crop production level; and 'research, business and management' at the commercial level. The findings showed the importance of phenomenological experiences: 'feelings' associated with sweat, yields and money generation, and a sense of agency and affective labour, linked to power of purpose towards self and socio-economy. Understanding the importance and merits of their learning activities made students reflect on meaning and positive feelings about themselves. This motivated them to achieve further learning goals.

Agricultural learning transformation seems to come through a combination of knowledge-based understanding in plants, how they grow, alongside the 'experience' of planting and growing crops successfully. Importantly, it is not just knowledge that the students get from the experience, it is the 'feelings' (emotion) that emerge from sweating under the sun that helps to consolidate that knowledge into part of their identity.

This study's findings about lower level agriculture learning seem to leverage on 'experiences' to create bigger learning outcomes prior to mastery in the discipline. Transformative learning occurred when learners studied through situated contextual experiential activities providing affective embodiment and thinking like agriculturists.

Thus agricultural understanding and transformation was triggered by 'experiential threshold concepts' whose foundations arise from integration of personal, *affective feelings* and everyday experiences with disciplinary ideas. Emotional feelings provide an added dimension to the 'basic threshold concept' work in Davies and Mangan (2008). These results reveal a new perspective on threshold concepts work, particularly relevant to disciplines involving processes and experiences.

They offer useful implications for a quality curriculum in agriculture which fosters personal identity transformation so more students become future agriculturists and help the economy. Of foremost importance is to include in the curriculum the key threshold concepts capable of transforming understanding and how to teach these concepts through meaningful/engaging experiences (via practicality and doing project-evidence/outcome-based learning) and provision of connections and relationships. The key for quality in the agriculture curriculum is therefore, how to translate and teach these concepts into meaningful affective learning experiences.