

## Crossing the threshold – Language and identity in learning concepts in biology

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Following Meyer and Land (2003), the acquisition of threshold concepts is transformative, resulting in an irreversible shift in how discipline knowledge is understood. They add, in later work, that this fundamental shift in learner perspective can be expected to coincide with increasing control over discipline language and an overarching transformation of identity as learners progress from mimicry to membership (Meyer & Land, 2005). In the context of biology, Ross et al (2010) suggest that such shifts and changes may reflect the process of intellectual and social apprenticeship to the discipline – “rather like the passage from novice to expert” (p. 6) – and, moreover, that the specialised language of the discipline may form a significant barrier to this process for many learners. These observations resonate strongly with a range of scholarship on student language and literacy learning for academic purposes. Leading researchers of both cognitivist (Bereiter & Scardamalia, 1987; Cummins, 2001) and sociocultural persuasions (Lea & Street, 1998; Ivanic; Haggis, 2006; Carter, 2007; Wingate, 2007; Bruce, 2008) broadly agree that becoming literate in an academic discipline involves coordinating language learning and thinking in increasingly sophisticated ways to enable participation in discipline practices of knowledge construction. There is an extensive literature on the difficulties of learning the language of biology including the conflict between “scientific” and “natural” language contexts (Ross & Tronson 2007; Ross et al 2010) and strategies designed to enable language acquisition in the learning of biology (Zhang & Lidbury 2006; Brown & Ryoo 2008) where part of the challenge for novices is coming to terms with the variety of language forms and communication genres (McCune & Hounsell 2005). On the other hand, there is little in the literature on how to engage linguistically with the learner to initiate the requisite identity shift (Lemke 2004). Here we report on an empirical study in a large first year class, at a mainstream tertiary institution, where students took on the identity of a biologist to write and receive feedback on explanatory narratives in key concept areas. These explanatory narratives were set in a relevant real world context and required students to surface the tacit knowledge and threshold concepts identified by Ross et al (2010) within each content area.

The study provides insight into the relationship between students’ understanding of threshold concepts in first-year biology and the design and communication of tasks that assess this learning. While these learning-oriented assessment (Carless, 2007) strategies engaged students in thinking and writing like a biologist they raise issues of linguistic and cognitive apprenticeship that may also apply to learning threshold concepts in other domains of science, or to facilitating ‘legitimate peripheral participation’ (Lave & Wenger, 1991) in any academic ‘tribe’ (Becher & Trowler 2001).

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