Development of a Physics Goal Orientation survey

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Abstract: *Together with cognitive processes, a key question in learning and teaching is: What motivates students to learn? In the second half of the 20th century "achievement goal theory" emerged as a key feature of the motivation literature. It focuses on what motivates students toward actions which will result in learning; students have particular goals and beliefs which orientate them to select particular strategies and ways of learning and planning their success.*

As motivation and goal orentations influence student learning outcomes, but no studies on goal orientations in university physics were found, this study focused on developing a goal orientation survey specific to university physics studies. A pilot study was undertaken in 2006 (Lindstrøm and Sharma 2008). This paper describes the continuation and conclusion of the study in 2007 and 2008 spanning five administrations, each with sample sizes between 162 and 360 students.

References

Lindstrøm, C. & Sharma, M. D. (2008). Initial development of a Physics Goal Orientation survey using factor analysis. *Visualisation and concept development. Proceedings of the UniServe science symposium.* Sydney, NSW: UniServe Science, 60-66.

Do interventions using threshold concepts assist learning in Biology?

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Abstract: *The current interest in threshold concepts in the disciplines (Meyer & Land 2003, 2005) may provide a powerful heuristic for academics to help students to pass through conceptual gateways associated with previously inaccessible and possibly troublesome ways of thinking. Meyer and Land used three critical descriptors to identify threshold concepts, namely being transformative, irreversible and integrative experiences which are typified by cognitive and ontological shifts often accompanied by an extension of the student's use of language. Ross et al (2009), as part of an ALTC funded research project on Threshold Concepts in Biology, have developed a framework of discipline and threshold concepts which identifies a web of threshold concepts in biology, some of which are equivalent to epistemes.*

Interventions were then designed, to test the threshold properties of one of these concepts, which we predicted would assist students to make the link between the submicroscopic and the macroscopic cellular world and their connections at various spatial scales. All students in an introductory molecular and cellular biology course, offered in their first year at university, were surveyed at the commencement of the course about their conceptual understanding of scale. Half this cohort was then given two different interventions relating to scale and the remainder were provided with material similar in format, but which only reinforced relevant curricular content. Students were then surveyed following these interventions to determine the effectiveness of the intervention.

Our results demonstrate the effectiveness of such an intervention in assessing whether once students cross one threshold, in a context such as cells and protein synthesis, they can subsequently transfer this way of thinking to aid in crossing thresholds in other contexts and other similarly difficult concepts in biology.