Identifying threshold concepts specific to science learning in nursing and the development of teaching approaches to facilitate their crossing.

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The learning and teaching of science subjects in undergraduate nursing programs can be difficult and a number of issues which contribute to this have been documented (McVicar & Clancy, 2001). Nurse educators are faced with the fact that nursing students have a wide range of different educational backgrounds and life experiences and many of these students struggle to recognise the relevance of these sciences in their program of study. Identifying threshold concepts and troublesome knowledge in the disciplines of biology (Taylor, 2006) and chemistry (Moss et al 2007) have been documented and focus largely on students who are studying to become 'scientists'. The study of science from the nursing students' perspective can be considered somewhat distinctive insomuch as these students only engage in the discipline for a brief time and therefore do not get the opportunity to 'think like a scientist'. As a result they can remain at an unsophisticated level of understanding which can act as a barrier to students as they try to make sense of abstract ideas which are quite alien and removed from their proposed nursing profession.

Identifying the central concepts is key to any discipline as advocated by Cousin (2006) in overcoming the 'stuffed' curriculum. Learning chemistry and biochemistry traditionally requires the development of a gradually increasing awareness and constant re-evaluation of the topics being studied. However, science courses in nursing do not have this luxury. Therefore, we need to re-evaluate the importance of the subject matter and provide different points of foci which relate the fundamental concepts to nursing practice.

The threshold concepts framework has proven to be useful by taking the "less is more" approach in curriculum design. A student evaluation of the 2009 cohort was performed in order to determine knowledge gaps and student confidence in certain areas. One potential threshold concept that was identified as a result of the evaluation was the formation of free ions in the human body and the concept of atom/compound stability. A shift in teaching emphasis on this topic and other topic areas has resulted in a more refined decision about what is fundamental to nursing students specifically. Prior knowledge of the material also plays an important role from the student's perspective. In response to the survey results a pre-study resource has been developed which students can use prior to the start of and during semester. The main essence of the resource was to provide a 'big picture' of the material and to present a few founding concepts as 'critical concepts' which would act as a trigger for students when they cover the material during

This presentation firstly explores the notion that threshold concepts within disciplines like chemistry and biology maybe different depending on the student cohort and the context of their study. It will also discuss a number of the specific threshold concepts identified through student evaluation and present a number of teaching approaches including the pre-study package. It is hoped that the ensuing discussion will provide a valuable opportunity to share with colleagues and to seek comment.

References:

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