Chapter 10

Concept Maps as Replacements of Written Essays in Efficient Assessment of Complex Medical Knowledge

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EXECUTIVE SUMMARY

Marking efficiency and timely student feedback are two aspects of assessment that may be greatly improved with concept maps (cmaps), if student learning style preference for more traditional approaches can be overcome. A semester-long exploratory case study was designed and performed in a distance aviation medicine course. This involved participant observations, interviews, and task analysis to investigate cmaps' claimed advantages for meaningful learning. The results showed that cmaps could be suitable replacements of written essays in the assessment of complex medical conceptual knowledge. Both present similar strengths and weaknesses; however, cmaps are faster to mark, and quickly reveal student understanding of a particular

topic. The discussion of results is informed by relevant literature on concept mapping (cmapping) in medical education, assessment for deep understanding, and learning styles. This research can benefit online postgraduate education programmes searching for alternatives to improve the assessment process.

INTRODUCTION

This chapter discusses outcomes of a pilot exploratory case study related to the use of Joseph Novak's concept map template (concept → linking phrase → concept; see Figure 1) in a distance postgraduate course, and its suitability as a replacement for written essays in efficient assessment of medical knowledge. Specifically, the aim was to investigate if cmaps could be used as an alternative method to evaluate students' individual conceptual understanding in "clinical aviation medicine." Before a more in depth description, some information about the study's origins is introduced.

As part of the expansion of the Occupational and Aviation Medicine Department, preliminary discussions have been undertaken on offering aviation medicine courses in Asia through the University of Otago's distance learning programme, potentially multiplying enrollments to several hundred students. Development of an alternative assessment system that is operationally feasible at a distance might address the assessment issues generated by educational programmes taught in high volumes, and to students with very different cultural and linguistic backgrounds.

This research into university teaching was undertaken in 408 hours with the support of the 2007 E-learning Enhancement Grant, awarded by the Committee for the Advancement of Learning and Teaching (CALT). Its overarching goal was to investigate how cmaps could be used in the courses run by the Department, since previous research demonstrates that they have been applied as an effective learning strategy for enhancing understanding and assessment tool in various educational areas including medicine. The project had four aims:

1. Review of the cmapping literature as it pertains to distance education, medical education, formative and summative evaluation
2. Development of master cmaps for subject areas
3. Trial cmaps in an existing aviation medicine course
4. Assess the use of cmapping as a part of a strategy to assist in the internationalisation of aviation medicine course content

While Gomez (2008) reports on every aim of the project, this chapter limits its scope to present only outcomes that impact aims 3 and 4. It uses the literature review gathered for aim 1 to inform the discussion and answer the research questions formulated by two lecturers teaching the course that was used in the study.

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