Knowledge Maps: A novel online tool for learning and assessment

Veronica Costin and Gary Velan
School of Medical Sciences, UNSW Medicine

Abstract:
Background: Concept and knowledge maps have the potential to improve student learning and understanding by promoting meaningful learning and critical thinking. However, providing manual feedback on students' maps is not feasible for large classes. Accordingly, a user-friendly, valid and reliable, automated online tool for assessment and feedback of students' maps might have significant benefits for learning.

Method: Knowledge Maps is an online mapping tool, which provides automated feedback on students' attempts. Three studies were performed: A) Group 1 completed a mapping activity on Ischaemic Heart Disease (IHD) and was given a link to existing resources on Deep Venous Thrombosis (DVT), while Group 2 received a map on DVT and was given a link to existing resources for IHD. Groups were assessed using a quiz including questions on both topics, then completed a usability questionnaire. B) Participants completed maps on cranial nerves, with a pre-test prior to the mapping activity and post-test following the activity. C) The potential utility of Knowledge Maps for assessment was investigated by comparing scores generated by the software with manual grading of a modified essay question (MEQ) on the same topic. A questionnaire was used to gather students' perceptions of the tool.

Results: A) A higher perception of learning was reported after using Knowledge Maps, but no difference between groups in quiz scores. Most participants agreed that they found the activity helpful to their learning and would recommend it to others. B) There was a significant improvement between pre-test and post-test quiz scores. C) Regression analysis showed a significant correlation between map scores and MEQ scores, and questionnaire responses were overwhelmingly positive.

Discussion: These preliminary studies show that Knowledge Maps software is readily accepted by both students and educators. Results from Study C suggest mapping provided a similar indication of students' understanding of a topic as a modified essay question, with the advantage of instant, consistent computer grading.

Conclusions: Knowledge Maps is a web-based system integrated with Moodle that can be used to create, edit and share maps, as well as providing automate feedback on students' inputs. This tool has potential benefits for learning in a variety of disciplines and might be a useful addition to the digital assessment repertoire in higher education.