

Uncovering assumptions about the introduction of concept mapping to first year students of anatomy and physiology.

Dr Natalia Bilton, Dr Patricia Logan, Dr John Rae and Dr Gregory Maynard
School of Biomedical Sciences, Faculty of Science, Charles Sturt University.

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Background

Learning can be defined as the cognitive change that results from experience [1]. The construction of new knowledge begins with our observations of events or objects through the concepts that we already possess. Concept mapping is a technique that can be used to help students construct new knowledge. In concept mapping, a concept is defined as anything that can be observed and a proposition is created when two or more concepts are linked by key words. To learn meaningfully, individuals must choose to relate new knowledge to relevant concepts that they already know [2]. Meaningful learning is supported when students join concepts with relevant, correct and valid linking phrases. An increase in learning quality is indicated by the integration of new information with old information using linking phrases. In this study, we used concept mapping to measure learning quality under two different learning conditions.

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Method

This study was divided into three phases.

Phase 1 (30 mins): Students completed a concept mapping exercise that measured what they already knew about the organizational structure of the human skeletal system (Pre-Test). Students were given the concept map shown below and were asked to include the concepts listed on the left hand side in their concept map. Students were also instructed to make sure that each concept was linked to another using linking phrases.

Phase 2 (60 mins): Students were assigned to either the experimental or control condition. In the experimental group, students completed a body painting learning activity. Students in the control group undertook the regular assigned lab activities for that day which included labelling, short answer questions and looking at models of the skeleton.

Phase 3 (30 mins): Students completed the same concept mapping task as in phase 1 (Post-Test).

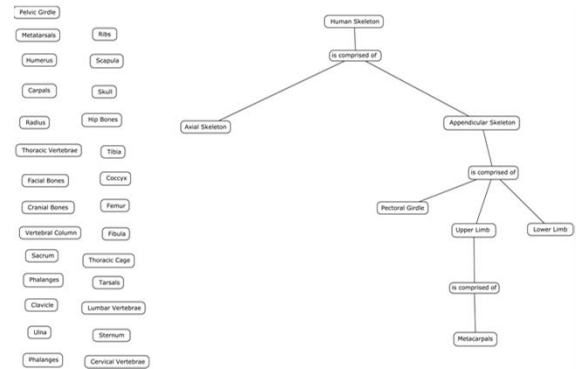


Figure 1: The concept map "test" that was presented to students.

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Data Analysis

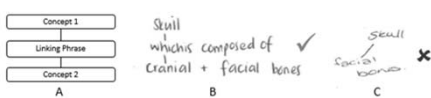


Figure 2: How concepts are linked (A), an example of a correctly linked concept (B) and an example of an incorrectly linked concept (C).

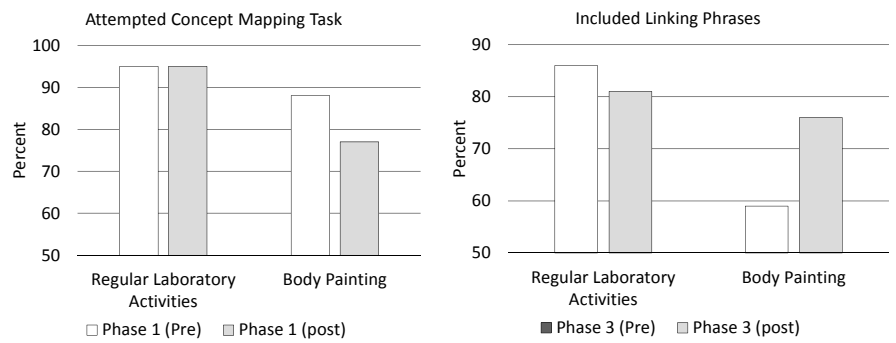


Figure 3: The percentage of students that attempted to make a concept map and those whose concept maps included linking phrases in the two conditions of our study.

Overall, 91% of the groups attempted to construct a concept map and 72% of those maps contained linking phrases. Despite random allocation of students to groups, those in the control condition showed more engagement with the concept mapping task (Figure 3A and B).

Qualitative survey data showed that the control group commented more about their actual learning (n = 10 of 21 responses), whereas the experimental group wrote more about 'fun' (n = 8 of 25 responses). Those in the experimental group were also more likely refer to the learning activity as 'visual' (n= 6 of 25 responses).

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Conclusions

Brief text-based instruction was found to be insufficient in producing concept maps with linking phrases. This study suggests that one cannot assume that students will learn to construct concept maps in a short time frame. An initial scaffolded concept mapping learning task would likely have enabled these first year students to better employ the technique, especially when it is used in conjunction with other visual teaching methods like body painting.

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References

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Contact Details

Natalia Bilton nbilton@csu.edu.au
02 658 29359