Students of All Learning Styles Report that Knowledge Maps are Beneficial to Learning

Ron Gerrits, Milwaukee School of Engineering, Milwaukee, Wisconsin

Ron Gerrits
414 277-7561
gerrits@msoe.edu

Introduction

Knowledge maps (a.k.a. relationship maps) are a way of presenting textual information in combination with graphical linkages . The linkages show the relationships between sets of information. Knowledge maps tend to include more detail and have greater structure than concept maps (see Figure s1 and 2 for an examples). I have been using expert-generated knowledge maps in my physiology, pathophysiology and pharmacology classes for the past few years and have received a number of positive comments about them on my instructor evaluation forms. In order to better determine how students perceived their use, and whether or not these perceptions were correlated to particular student learning styles, a retrospective study was performed to test the hypothesis that students of all learning styles would find the knowledge maps beneficial to learning.

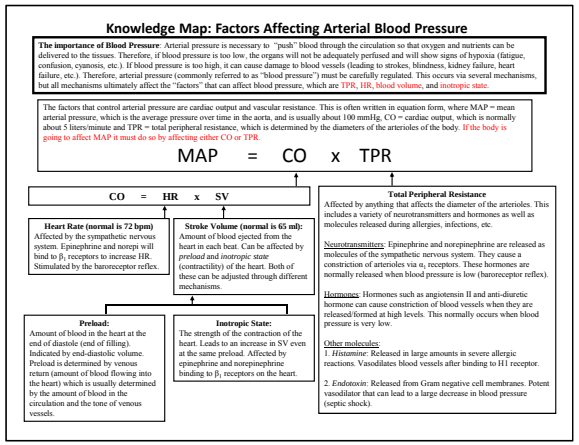

Figure 1: Knowledge Map of Blood Pressure Regulation[1]

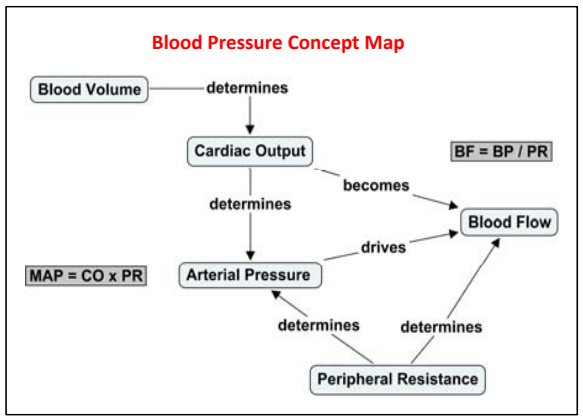

Figure 2: Concept Map of Blood Pressure Regulation[1]

Methods

1. A retrospective survey was administered to thirty-one previous students who had not taken any courses with me for at least one academic quarter.
   a) The first section of the survey asked students to take and report their scores on the VARK exam.
   b) The second section asking free response questions such as "what was most beneficial to learning in Dr. Gerrits' class" .
   c) The third section asked questions focused specifically on knowledge maps. Students were unaware until the third section of the survey that knowledge maps was the focus of the study.
2. A Chi-square analysis with William's correction (used when numbers within the Chi-square test are low) was used to determine if there was an association between learning styles and the responses to the questions on the survey.

Results

•Student learning styles, as determined by the VARK exam[3], are shown in Figure 3.

•Most students identified knowledge maps as beneficial to learning on the free-response portion of the survey, and all responded that they were beneficial when asked specifically about them (Figures 4 and 5). This was not associated with learning styles.

•Almost all students have referred to the knowledge maps in future courses and 58% have drawn their own (Figure 6). This was not associated with learning styles.

•When presented with the knowledge map and concept map shown in Figures 1 and 2, 55% reported preferring the knowledge map, and 40% stated they would be equally beneficial. This was not associated with learning styles.

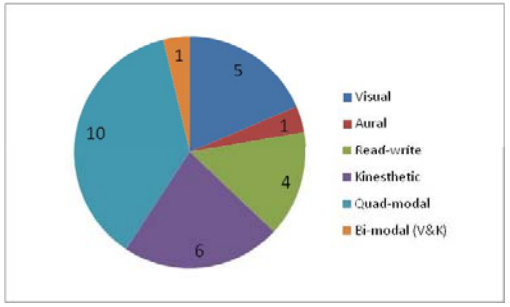

Figure 3: Student Learning Styles

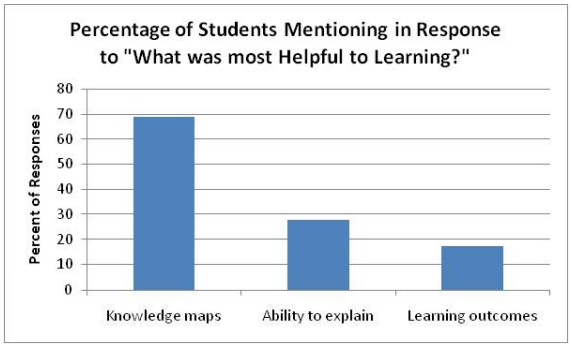

Figure 4: Top 3 "Free Response" Answers

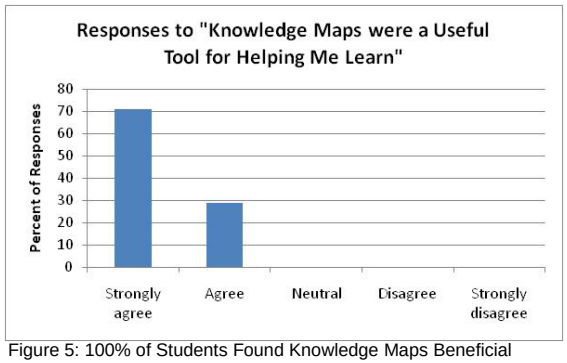

Figure 5: 100% of Students Found Knowledge Maps Beneficial

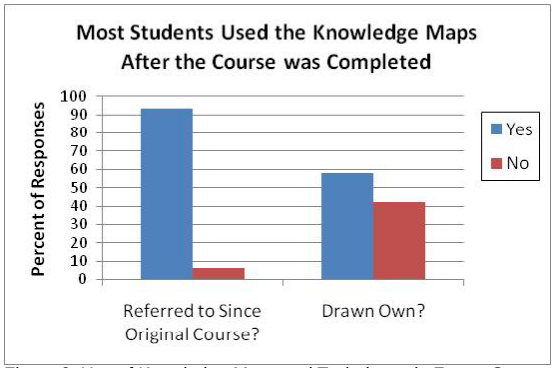

Figure 6: Use of Knowledge Maps and Techniques in Future Courses

Conclusions

• All students report knowledge maps as beneficial to learning, making the perception independent of learning style.

•Because student often use them in multiple courses, it indicates that they can help link information across these courses

[1]From Gerrits, Ron. Case Study for Teaching the Variables that Regulate Arterial Pressure. *American Physiological Societies Archive of Teaching Resources* (www.apsarchive.org), 2007.
[2]Thankfully obtained from Bill Cliff at Niagra University, NY.
[3]Scored using VARK scoring software purchased from http://www.vark-learn.com/english/page.asp?p=products

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