**Group Learning in the Classroom**

Group Concept Mapping Activity

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 Last fall, I tried a new activity in my Developmental Biology course (BIOL370). For several years, I have included concept mapping exercises as daily assignments for students. Students draw a concept map illustrating the integration of the main concepts of the previous class period. Concept maps are turned in at the beginning of class. After class, I grade them and then return them to students at the beginning of the next class meeting. I like using the maps as formative assessment tools. I can quickly pick up topics/concepts that students misunderstand or find confusing. Over the years, I began to notice a correlation between the structure of a particular student’s daily concept maps and their scores on exams. Some students draw fully integrated maps pulling in information from numerous courses including very descriptive linking phrases, I’ll call these students “mapping gurus.” Other students merely draw a linear flow-chart like map using vague linking words, these students are referred to as “mapping flow-charters.” The students with the more complex maps consistently earn better grades in the course than do the students with the rudimentary maps. I reasoned that there was something that my “mapping gurus” know how to do that my “mapping flow-charters” do not. What is the difference? I have not collected quantitative data, but my gut feeling is that “mapping gurus” know what it means to integrate knowledge while the “mapping flow-charters” either do not know what it means to integrate or they do not understand how to integrate.

 I feel for the “mapping flow-charters.” These are the students who try hard but never seem to “get it.” I wondered if it would be beneficial for “mapping flow-charters” to work with “mapping gurus” to generate concept maps such that the “flow-charters” could observe and mimic the thought processes that the “gurus” use. Several times during the term, I divided students into groups, gave them a list of concepts and asked them to construct a map including those terms plus other concepts from BIOL373 or other courses. I was nervous to do this. I was not sure how things would go, but I was pleasantly surprised. As I watched groups work, each member of the group participated (including the low achieving students). There was productive discussion about appropriate linking phrases. Pages were turned in notebooks as students reviewed material, and questions reflecting a high level of understanding were asked.

 My exams in this course were divided into three sections: an individual assessment, a group concept map, and a self-assessment. The individual assessment included multiple-choice, true/false, short answer, and essay questions that students answered individually. The group concept assessment was as I described above except that I included concepts from each section of the unit being assessed, forcing students to interconnect seemingly distinct topics. The self-assessment was a written reflective component of the exam designed to initiate deliberate reflection about each student’s development as a learner. Again, I was nervous about this format, but, again, I was pleased with the outcome. All students participated in constructing the concept map of their group. Students augmented each other’s ideas, they corrected each other, and (best of all) they took the task seriously. The maps that groups produced were high quality maps, even though students had a strict time limit on how long they could take to construct it. Most importantly, I observed upward movement in exam scores in nearly all of the low achieving students as the term progressed. It is difficult to tease out any one learning tool that might have made the difference; however, my impression is that group concept mapping did not hurt students. The collaborative learning that took place before exams was useful for students, and the collaborative learning on exams gave students a feeling of comfort and satisfaction that they could find a way to connect the concepts I gave them.

 My group concept mapping experience with this cohort of twenty-five students was positive, and I plan to continue to use this learning tool in my course with the addition of more intentional assessment.