

THE USE OF CONCEPT MAPPING IN INTEGRATIVE LEARNING WITH ALLIED HEALTH PROFESSION STUDENTS

Dawndra Scott, John Pelley, & LesLee Taylor, Texas Tech University Health Sciences Center, USA

Abstract. Educators in Allied Health Professions are always looking for effective teaching methods to enhance student learning in the classroom. Promoting critical thinking through integrative learning is necessary to allow students to transfer knowledge from the classroom environment to the real world environment of the clinic. Concept mapping is a teaching technique that has been used in a variety of educational settings to promote integrative learning and can be utilized with different student learning styles. Concept mapping can be used as a teaching method for individual and group instruction. The purpose of this study was to investigate the role concept mapping plays with integrative learning in individual concept mapping versus group concept mapping with Master of Athletic Training (MAT) and Master of Occupational Therapy (MOT) students. This study focused on differences between individual concept maps and group concept maps. MAT students (n=32) and MOT students (n=59) participated in this study. Students participated in two 50-minute concept mapping sessions. Students were required to complete an individual concept map as a homework assignment. Measurements for each student included an individual concept map score, time to complete the individual map, a group concept map score, and a change score from individual to group concept map. Findings identified a statistically significant difference ($p < 0.0001$) between change scores from individual concept map scores and group concept map scores, supporting the idea that group work can enhance individual work. This study and its application of concept mapping have practical implications for educators. Concept mapping can be an effective teaching method to use in the classroom as both an individual and group assignment.

1 Introduction

The development of critical thinking skills in athletic training and occupational therapy students is vital in effectively transferring information from a classroom setting to a “real world” setting. Critical thinking skills are necessary for students in a healthcare field to have a conceptual understanding of the material rather than relying strictly on rote memory. Adema-Hannes and Parzen (2005) have used concept mapping as a critically thinking tool for nursing students to apply classroom knowledge to a clinical setting. The concept map helped the students organize their thoughts, plan the care of their patient, prioritize, and critically think. Concept mapping as a teaching method can be used as an individual or group activity. Group learning, also known as cooperative learning “is the instructional use of small groups so that students work together to maximize their own and each other’s learning” (Johnson, D.W., Johnson, R.T. & Holubec, 1993, p. 6). Formal cooperative learning involves students working together to achieve shared learning goals aimed at collective completion of specific tasks (Johnson D.W., Johnson R.T., & Smith, 1998). Concept mapping is a task that could be given to a small group of students and completed in one class period.

2 Study Design

This study employed concept mapping as a small group task. Concept mapping has been identified in the literature as an effective teaching method to incorporate constructivism in the classroom to promote integrative learning. Concept mapping has the potential to give students in small groups the sense of direction and purpose needed for the group to run smoothly and effectively. A review of the literature shows there is limited research on the use of concept mapping in a Master of Athletic Training (MAT) or Master of Occupational Therapy (MOT) programs. This study was conducted to examine the benefits of concept mapping as a teaching method to promote integrative learning with MAT and MOT students. For this research project, a comparison was made between the change scores on individual case maps and group case maps.

2.1 General Study

Concept mapping was introduced in four different courses in the Spring 2006 semester. Each course instructor chose a concept mapping topic from a lecture covered early in the semester and also created a concept map which was used as a “reference” map when scoring student concept maps. Instructional objectives incorporating concept mapping also were included in each course and were tied to specific course content. A grade for the concept map

assignment was part of the course assessment (in-class participation grade – one percent of their grade). Full credit was given for completed maps. Two 50-minute class periods were utilized in each course.

During the first class period, the researcher explained to the students the purpose of the research study. The consent form was explained and students were given an opportunity to ask questions about the research study. Students were given the option to sign the consent form to allow their concept map scores to be used for the study. All students (n= 92) agreed to participate in the study. The researcher introduced concept mapping and each student was given a handout outlining steps in concept mapping along with examples of concept maps. Students assisted the researcher in constructing a concept map on the topic of “headache”. Students were shown the grading system for the concept map. Each proposition link scored one point, each hierarchy scored five points, and each crosslink scored ten points. Students were then assigned a homework activity to construct an individual concept map on a topic covered in the course. The information used in the concept map was limited to information testable in that course. Students were also asked to record on the back of the individual concept map the time it took to complete the individual concept map.

At the next concept mapping session students turned in their individual concept map to be copied at the beginning of the session. At a later date, the researcher scored the individual maps and recorded the information on a data collection sheet. The researcher scoring the concept maps has several years of experience with concept mapping. Accuracy of the links was verified by consulting the course instructor’s concept map or the course instructor. Individual maps were handed back to the students (after they were copied) and students used their individual maps to construct one group map. Each group (of four to five students) had 25 minutes to merge their individual concept maps into one group concept map. The researcher collected the group maps and scored the maps later. Qualitative questions about the concept mapping process were discussed at the end of the session.

2.2 Results

Analysis of the data was done using descriptive and inferential statistics. Procedures that were used included descriptive statistics such as mean, minimum, maximum, range, and standard deviations as well as the Mann Whitney U. Results were identified as being statistically significant at, or beyond the 0.05 level. The Mann-Whitney U test was run to compare the change score for individual concept map scores and the group concept map scores. The test statistic U (5631.5) indicated that concept map group scores were significantly higher than individual concept map scores ($p < 0.0001$).

2.2.1 Qualitative Feedback

Qualitative feedback was collected to obtain student perceptions of the individual and group concept mapping process. Comments from students included the following:

- “Using the linking words made it easier for me to understand the concepts, otherwise it was just a bunch of words.”
- “Helpful for studying as you do the process.”
- “I can see how it is a way of getting it out of my head so you can see how I am thinking, but it was challenging because it was a different way for me to learn.”
- “The concept mapping challenged me to think.”
- “It helped to see what I had already learned and I was not familiar with.”
- “It helped me to stay focused.”
- “I think a broader topic is harder to map than a smaller topic.”
- “I had to do several drafts before I came up with my final concept map.”
- “It was easier in a group than doing it individually.”
- “We found it easy to integrate the information from each individual map.”
- “We liked doing our map with the group using our individual maps because we could see how and where we could place some of the links we had trouble placing on our individual maps.”
- “It helps us to see another person’s way of thinking. Some of my classmates thinking processes were very different from my own.”
- “I found that I really had to know my material/map because I had to teach others in the group what I was thinking.”
- “We only had 25 minutes for the group map and some of us took up to 2 hours on our individual map.”

2.3 Examples of Concept Maps

There were differences in time students spent on individual concept maps. The minimum amount of time spent on an individual concept maps was 20 minutes and the maximum time was 180 minutes. It is interesting to note the differences in map construction. Figure 1 provides an example of a student's individual concept map on ethics. The construction is linear with very few cross-links. Group concept mapping appears to be a strategy to push linear thinkers to a higher level of thinking. Figure 2 shows the group concept map for the student whose individual map is found in Figure 1. Note how the group map has more hierarchies and cross-links.

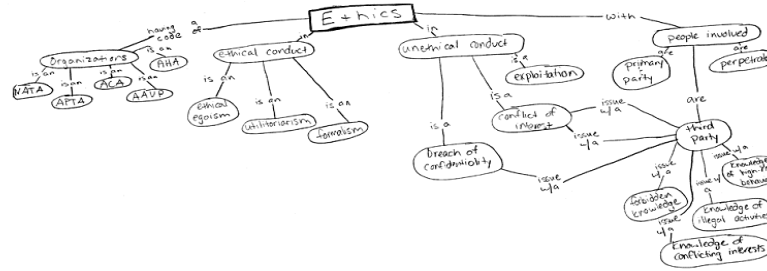


Figure 1. Individual Concept Map on Ethics

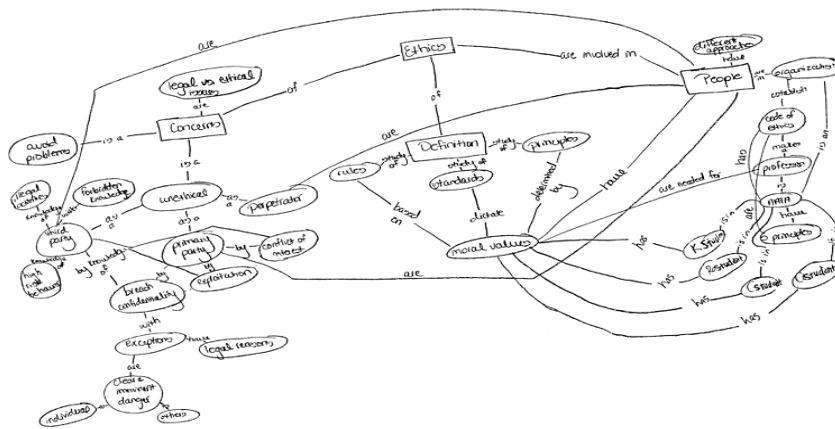


Figure 2. Group Concept Map on Ethics

Figure 3 provides an example of a student's individual concept map adapted as a group map. This student also went to the course instructor's office and expressed her enthusiasm for concept mapping. She stated, "I probably went way overboard on this assignment, but I really enjoyed the concept mapping technique." It was interesting to observe the group interaction involving this student's concept map. When students in her group compared their individual maps, they decided her map was an adequate collective summary of everyone else's maps. They used her map and "added" concepts she was missing.

