**Visual Learning Through Concept Mapping**

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## Abstract

This paper describes and demonstrates the use of electronic visual learning tool Open Mind in the classroom to create concept mapping. The concept maps are used either at the beginning of starting a new topic in the classroom to assess prior knowledge or at the end to summarize student's new learning. It develops the critical thinking skills, explores understanding of concepts and links to their future learning. The instructor can also create the concept maps and each box can be electronically linked to add images, pictures, Flash, audio, video, clipart, text, and power point documents. Finally the completed concept map can be exported to Microsoft word, power point, or HTML and can be used as a document or Web page. This software can also be used to make electronic portfolios. The lesson plan and other documented maps serve as links to the electronic portfolio or the portfolio itself.

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**An investigation of the effects of interventions on problem-solving strategies and abilities**

by [Cox, Charles Terrence, Jr.](javascript:void(0);), Ph.D., Clemson University, 2006 , 185 pages; AAT 3217983

## Abstract (Summary)

Problem-solving has been described as being the "heart" of the chemistry classroom, and students' development of problem-solving skills is essential for their success in chemistry. Despite the importance of problem-solving, there has been little research within the chemistry domain, largely because of the lack of tools to collect data for large populations. Problem-solving was assessed using a software package known as IMMEX (for Interactive Multimedia Exercises) which has an HTML tracking feature that allows for collection of problem-solving data in the background as students work the problems. The primary goal of this research was to develop methods (known as interventions) that could promote improvements in students' problem-solving and most notably aid in their transition from the novice to competent level.

Three intervention techniques that were incorporated within the chemistry curricula: collaborative grouping (face-to-face and distance), concept mapping, and peer-led team learning. The face-to-face collaborative grouping intervention was designed to probe the factors affecting the quality of the group interaction. Students' logical reasoning abilities were measured using the Group Assessment of Logical Thinking (GALT) test which classifies students as formal, transitional, or concrete. These classifications essentially provide a basis for identifying scientific aptitude. These designations were used as the basis for forming collaborative groups of two students. The six possibilities (formal-formal, formal-transitional, etc.) were formed to determine how the group composition influences the gains in student abilities observed from collaborative grouping interventions. Students were given three assignments (an individual pre-collaborative, an individual post collaborative, and a collaborative assignment) each requiring them to work an IMMEX problem set. Similar gains in performance of 10% gains were observed for each group with two exceptions. The transitional students who were paired with concrete students had a 15% gain, and the concrete students paired with other concrete students had only a marginal gain. In fact, there was no statistical difference in the pre-collaborative and post-collaborative student abilities for concrete-concrete groups.

The distance collaborative intervention was completed using a new interface for the IMMEX software designed to mimic face-to-face collaboration. A stereochemistry problem set which had a solved rate of 28% prior to collaboration was chosen for incorporation into this distance collaboration study. (Abstract shortened by UMI.)