

The Journal of Scholarship of Teaching and Learning (JoSoTL)



Volume 3, Number 1 (2002)

Copyright 2002, The Trustees of Indiana University. Except as may be expressly provided elsewhere in this publication, permission is hereby granted to reproduce and distribute copies of individual works from this publication for nonprofit educational purposes, provided that copies are distributed at or below cost, and that the author, source, and copyright notice are included on each copy. This permission is in addition to rights of reproduction granted under Sections 107, 108 and other provisions of the U.S. Copyright Act.

The Scholarship of Teaching and Learning:

Facilitating Adult Learning

Barbara J. Daley

Adult and Continuing Education
Department of Administrative Leadership
University of Wisconsin – Milwaukee
P.O. Box 413
Milwaukee, WI 53201
bdaley@uwm.edu

Abstract

In the Scholarship of Teaching and Learning (SOTL) project I developed, I chose to investigate how constructivist teaching strategies influence the learning processes of adult students in higher education. I chose to teach two groups of students to use a constructivist strategy called concept mapping. They used this strategy during the courses I taught in the first semester of this study. Then, I followed these students during semester two to see if they continued to use concept maps and to find out how the use of maps impacted their learning. To accomplish this, I checked the students' first map and final map from semester one, and their maps, if any, from semester two. In addition, we interviewed the students at the end of semester one, and again at the end of semester two, to find out how the use of mapping affected student thinking and learning. Results indicate that 65% of students continued to use maps in the second semester and all students reported changes in their thinking.

Framing the Question

The question of how adults learn has always held a deep fascination for me. I believe this is because I started my professional career as a nurse and my first exposure to formal teaching was as a staff development instructor in an acute care setting. In that setting, I was always intrigued by the fact that staff development programs for adults produced such varied and unpredictable results. Some adults used the information presented and some did not. This raised two questions for me, "How do these adults learn within the context of their practice?" and, "What can I do to facilitate that type of learning?" As I moved on in my career, I decided that I wanted to understand this learning question in a much deeper sense and, thus, chose to pursue doctoral work in adult and continuing education. Ultimately, I accepted a faculty position in that discipline.

However, before that time my teaching experience included working with adult students in community college and university settings. Often, I saw these adults enter higher education relying solely on learning strategies that had worked for them in the past. Most often these strategies were rote learning, including memorization, recall of information and passive learning. I began to think about how I could not only teach the content in my courses, but how I could also help adults to understand their own learning processes. From my work as an adult educator, I knew that adults had experiences that were rich resources for learning and, yet, I often saw adults avoid using that experience in a higher education setting.

At about that same time, I came across the work of Stephen Brookfield. Brookfield (1995) advocates the position that if we are to become critically reflective teachers, we need to examine how we as teachers learn from our students, from our autobiography, from theory, and from our colleagues. I decided to take Brookfield's work seriously and began to think about my own experience as a learner, or my own autobiography. When I looked back at my own learning, I recognized that it was in my doctoral program at Cornell University that I began to understand my own learning. In that program, I was fortunate to be able to work with Dr. Joseph Novak (1984, 1998), and to learn more about constructivist learning and the use of concept mapping. As I began doing concept maps, I recognized that I did not understand how to link concepts. Additionally, I had not learned how to search out interconnections across bodies of knowledge, nor had I learned how to develop a shared meaning with the instructor. Using concept maps helped me to understand how I learned. As I developed this understanding, I started to use concept mapping in the courses I was teaching and each time I used it, I saw significant changes in how students learned. I also saw resistance from students and from other faculty in the use of this particular strategy. I would get questions from both students and faculty such as: "Why are you doing this?" "Does doing concept maps really make a difference?" Since I was teaching in a college of nursing at that time, a few colleagues and I, who were interested in mapping decided to study the learning outcomes for nursing students using maps (Daley, 1996; Daley, et al, 1999). In this work, we did see changes in learning and were able to document some information on how

mapping influenced the learning process.

The issue for me then took on another aspect. Did students, once they left the courses that I taught using mapping, continue to use that strategy? I was curious about long-term student changes where mapping was not required. To me this question is very important because if the purpose of the mapping is to help students understand their own learning and to foster a “learning how to learn” (Novak, 1984) approach, then it seemed really important to know if they continued using this strategy. Also it seemed important to know if mapping was incorporated into their learning and thinking activities irrespective of its use in specific courses.

At about the time I was pondering this question, the University of Wisconsin – Milwaukee, under the direction of Tony Ciccone with the Center for Instructional and Professional Development (CIPD), began participating in the Scholarship of Teaching and Learning Program with the Carnegie Foundation for the Advancement of Teaching. CIPD sponsored a Center Scholars program and provided funding for me to investigate how adult students learn with concept maps. The funding allowed me to follow students for a year and see what impact the maps had on their learning.

Context of the Work: Adult and Continuing Education Graduate Program

I currently teach in an adult and continuing education graduate program. The students in our program are all Masters or Doctoral students who come to us from a variety of disciplines. Many of our students are trainers in business

and industry, staff developers in health care, faculty in vocational technical institutions or teachers of adults in community-based agencies. Our students, all adult learners themselves, are on average 35-40 years old.

I chose to use two different courses in this project. The first is a Masters Degree course which is the initial course our students take when they enter our program. Since these students are very new to graduate education, they are often concerned that they do not have the ability to succeed in graduate school, and are often unsure of the requirements. Many have been out of school for a number of years and feel their academic skills are a bit rusty. The second course in this project is an elective in our program attracting predominately doctoral students. The second course was also taught completely on-line, with only one face-to-face orientation meeting.

In each course, I taught students to use concept maps by first having them read literature on concept mapping. Then we discussed mapping, either face-to-face or on-line, and they practiced developing maps by mapping out an article from their reading. In the first course, students did concept maps on their reading as a way to frame a paper on their development as adults, and in classroom exercises as a way to link conceptual material from the course to their own experiences. In the second, the on-line course, students did concept maps of case studies and used the maps to link the case study to their reading. Additionally, they mapped out and compared and contrasted two books. Finally, students in the second course created concept maps of their readings.

The face-to-face course met once a week during the evening. In this course, students developed maps any way they wanted. Some chose to hand write the maps, some did them on a computer program called Inspiration (<http://www.inspiration.com>), and some used other programs such as Microsoft Word or PowerPoint. The on-line course was structured in seven modules, including readings, learning activities, individual or group project work and on-line discussion time. In this course, students created their concept maps in Cmap, a server-based program created at the University of Western Florida (<http://cmap.coginst.uwf.edu/>) and installed on the UWM School of Education server. Students learned to access the Cmap program and then to develop maps on the server. In this way, students in this course could view their colleagues' work.

The purpose of this study was not necessarily to look at the impact of technology on the mapping process. However, because one course was face-to-face and one was on-line, the project did end up acquiring a technology facet. Still my major interest is how mapping shapes learning, whether face-to-face or on-line.

Finally, I used quantitative and qualitative research methods since both research methods are valued within the field of adult and continuing education. Moreover, since the purpose of this study was two-fold, first to see changes in concept maps, and second, to understand the student experience of learning with maps, it seemed to me that a mixed-method approach was needed.

Gathering Evidence

The major question that I wanted to investigate in this study was how concept mapping impacts adult student learning over time. To do this, I chose first to request that students participate with me in this venture. All the students enrolled in both courses agreed to have their course work analyzed and used in this study. While some students requested that certain pieces of their work not be used, as they saw them as very personal accounts of their growth and development as adults, most students were very agreeable about being interviewed and having their work analyzed.

In the Fall 2000, I collected the first and final concept maps created by 21 randomly selected students from these two courses. Then in December 2000, my assistant interviewed these 21 students. At first, I wanted to talk with students about how the mapping influenced them. However, I came to realize that if I did the interviews the students might tell me what they thought I wanted to hear. To avoid this potential bias a doctoral student in adult education, completed the interviews. We structured the interview guide so that she asked the following questions: 1. What was it like to use concept maps as a learning strategy? 2. What did you learn while doing concept maps? 3. Where else have you used the maps since the completion of your course (if at all)? 4. How was doing the maps the same or different than other learning strategies you have used previously? 5. What did you like most/or like least about using concept maps? 6. What changes, if any, did you see in your thinking ability since using concept maps? 7. What was the most significant learning you remember from this course? 8. If you were going to describe concept mapping to another graduate student, what would you say? 9. How do you see using/or not using this learning strategy in the future? At the end of the first semester, we scored the first and final maps, then

analyzed the qualitative data collected by developing categories and coding the data.

In May 2001, we again contacted each of the 21 students and completed a second interview. If these students had constructed a concept map in the second semester, we then asked them to send us a copy of that map. Once again, we scored the maps (see Novak and Gowin, 1984 for scoring formula) and analyzed the interviews through a system of categories and codes. This is the dimension of the study which is most unique since, to my knowledge, there has been little work done following students over a period of time to see if and how their learning strategies change after learning concept mapping.

Emergent Findings and Broader Significance

So what has this work demonstrated about student learning? During the first semester there was a statistically significant change in student concept map scores from the first to the final map. The mean score on the first set of maps was 44.81 and the mean score on the final maps at the end of the semester was 121.43, for a difference of 76.62. This change in mean scores indicates that students learned to subsume lower order concepts under higher order concepts, to progressively differentiate concepts and to synthesize concepts on their maps. These findings indicate students learned to link, develop interconnections, analyze and synthesize course information with their experiences. What was really exciting to me, however, was that 65% of the students continued to use maps into their second semesters. For those students who did use the maps, the

mean score on the maps from the second semester was 120.22. This seems to indicate a significant change from the end of the first semester in the quality and development of maps in those students who continued concept mapping. Two things are of particular interest; first, many students continued to do maps, and, second, that the mean score was virtually the same. I anticipated that the means would decrease to some degree compared to the end of the first semester.

When analyzing the interview findings, we were able to categorize student responses in three basic categories that indicated how they learned and used cognitive mapping. These categories were: Developing Cognitive Maps, Learning with Cognitive Maps and Follow-up. An example of a cognitive map is presented in Figure 1.

Developing Cognitive Maps

What students indicated was that their learning was facilitated when they understood how to develop maps. This involved understanding their own initial reactions, which were often negative, and being able to articulate how that reaction changed over time. Additionally, students indicated that they needed to be able to describe mapping to others and discuss what they liked and disliked about it and where they were having difficulty in creating maps. Finally, students expressed the view that their comfort and familiarity with computer software often impacted how they felt about mapping and how much they were able to learn from mapping.

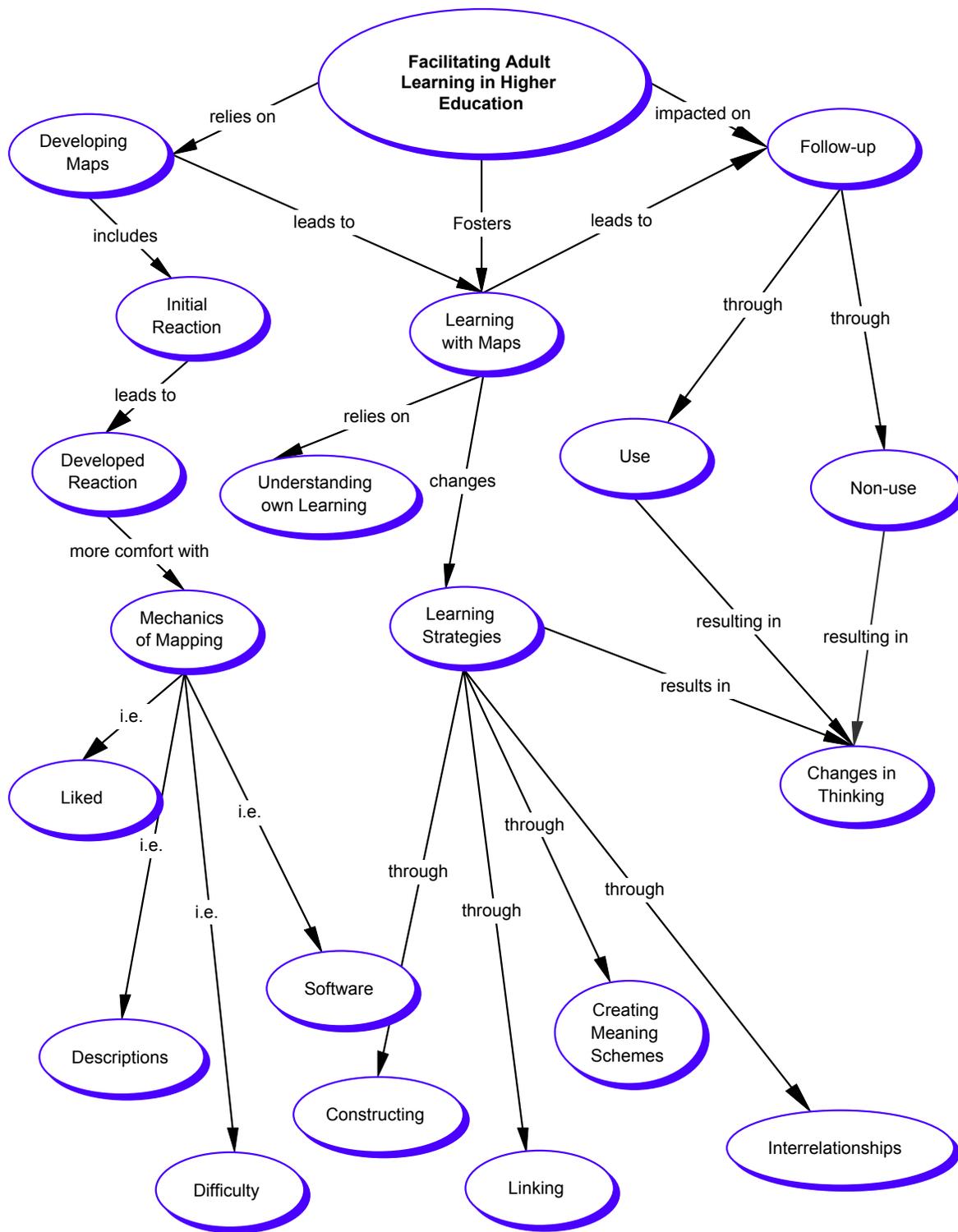


Figure 1: Facilitating Adult Learning in Higher Education Learning with Cognitive Maps

Students also indicated that mapping helped them to understand their own learning. It was through understanding their own learning that students began to use maps to develop the learning strategies of linking concepts, developing interrelationships, creating meaning schemes, and constructing knowledge. We could see from student responses in the interviews that linking was the first step in developing these new learning strategies. Students learned to link concepts in ways that made sense to them and connected with their previous experiences. They also learned to search out relationships among concepts. They told us that they learned how they were creating meaning schemes and constructing their own knowledge base through this process.

It was very exciting to hear student say things such as:

You read it first and then you pull out the basic concept, the major concepts that are within that framework and you draw connections between those concepts, and you are going to see connections and you are going to see distinctions that were not apparent to you before you sat down and actually did that. That is how you construct your new knowledge

or,

Concept mapping is a way to take the idea, apply it, and get a deeper meaning out of it at the very end. It is not just a matter of learning a concept, learning about theory, defining a word and spitting back a definition. It is actually applying it to what you know so that it makes more sense in the actual world.

or,

I would say things like the purpose of concept maps is to

help us explore the meanings, the inner-relationships, that we are making as we developing our understanding of the concepts. So that it is a meaning/making process. That is what really grabs me, anyway.

and, finally,

It made you look at whatever it was you were doing in its entirety. It made you look at it as a whole. And then started breaking it down by concepts and then you would rebuild it by linking stuff and I guess that is how I constructed new knowledge or how I found myself looking at things differently. You feel the knowledge building. You just feel yourself seeing things differently than before you started doing that.

There were some students in the study who had difficulty creating maps and using mapping as a strategy. The difficulties seemed to be related to the time required. Often students would indicate that this type of learning activity required more time than they were prepared to, or wanted to, give to the particular assignment. Other students admitted that the difficulty they had with maps had more to do with changing how they learned. Students stated that the maps required them to think differently and some students just did not like that.

As this student indicates:

But, I guess what I hated the most was that I had to change my thinking mode. It is before, like, well, I am just reading this information, and I am picking out what I see is in the writing or what the writer is trying to present. I guess I just didn't like the idea of changing old habits and doing things differently.

Follow-up

In interviewing the students on follow-up we found that 65% did continue to use mapping as a learning strategy, but even those who did not use cognitive maps in future learning reported that their thinking had changed. Students were able to describe how, when they approached learning a new topic, they started to think conceptually, searching out interrelationships and looking for ways to connect the information with their experiences. What I found very interesting was that students were able to describe changes in their thinking even if they no longer sat down and formally developed maps.

In this project, students who continued to use mapping reported that they did so for a number of reasons. They seemed to use maps to understand course material in subsequent graduate courses. They also relied on maps as a way to understand particularly difficulty material. Many participants reported that when they felt “in trouble” in a course or that they “did not get it,” they would try mapping out the material as a way to develop their understanding. Additionally, learners tended to use maps to frame projects for subsequent courses or work-related projects. One participant described how he had a big project to do at work and as a way to help his team understand the scope of the project, he mapped it out and shared the map with them. Another student described how she used a concept map in a subsequent class to demonstrate decision-making.

The students who did not use mapping indicated that they chose not to because it was not required, took too much time or they did not have access to concept mapping software. This last statement was a surprise to me. In teaching the

classes, I thought I had been clear that the maps could be constructed in most any way the students chose. However, since the software does facilitate the actual mechanics of mapping it seemed that for those who did not create the maps, the lack of access to software most likely compounded the time problem.

Another interesting aspect of this study was that it included both an on-line and a face-to-face component. It did not appear that there was any difference in the quality of maps created by the students in the on-line and face-to-face courses. However, in the on-line course, there was a higher percentage of students who continued to do maps at the one-year follow-up. My sense is that this finding emerged because there were mostly doctoral students in the on-line class and those students saw the maps as tools to assist them in the conceptualization of their dissertations, as a way to synthesize literature reviews and as a way to conceptually link research and theory courses. I did not get the sense that the on-line component of the course facilitated map development, but rather that the students’ need to use the maps in subsequent scholarly work seemed to be the motivator to continue. That said, I think the connections among mapping, software and technology are still very important issues for further investigation.

Conditions of Doing Scholarship of Teaching and Learning

Part of what made it possible to do this project was timing. The University of Wisconsin – Milwaukee has begun to look at the SOTL approach and has initiated a number of activities designed to inform faculty of its possibilities.

Being involved in some of the initial committee and planning meetings, I found myself getting very excited about the possibilities for research and scholarship around teaching and learning issues. So, when CIPD offered small grant opportunities to design SOTL projects, I applied. The grant funding was important because it did allow me to buy myself out of one course and to fund the typing of transcripts. However, more important to me was the acceptance of this kind of work by colleagues within my own department and across the University. Funding is great, but without a commitment by the institution and one's colleagues, it would be difficult to persist in work studying our teaching and learning practices in higher education.

Benefits of the Work

I see the benefits of this work as three-fold. First, the students benefit. By studying, analyzing, reflecting on and changing our teaching practices, we offer new insight to students and facilitate their learning in ways that we may not have thought about previously. Second, I, personally benefit. I found myself very excited about this project because it allowed me to look at my teaching and ask questions that I felt could only help me become a better teacher. It also motivated me to continue using mapping once I saw the results.

Finally, the institution benefits. As we develop an institutional reputation for focusing on teaching and learning, that reputation can only enhance our credibility and authenticity within the communities in which we live and provide our services to students.

Lessons Learned

As I think back on the lessons learned in this project, one of the things that struck me was how difficult it is to get learners to change their learning strategies. I knew there would be resistance to doing concept maps, but I did not expect students to articulate that one of the things they did not like about mapping was having to change their ways of thinking. It again points out to me the depth to which learning strategies are engrained. Cerbin (2000) seems to agree when stating, "I now believe much more firmly that changing students' minds, moving them to 'deep understanding,' is quite a bit harder than is usually recognized" (pg. 16).

I also learned that it is important to continue investigating the connections between learning and technology. In this project, students expressed how the use of software was important in learning to develop concept maps. Moreover, the on-line course results were in some ways different than the face-to-face results. This indicates to me that much more work is needed in this area.

Additionally, I think that I learned just how invaluable our peers can be and how much we can learn from them. Because this project was funded by CIPD, there were other Scholars working on SOTL projects on campus. A group of five Center Scholars met monthly. These group meetings provided a safe place to talk about the work, to discuss the set-backs and to offer peer-based critique and feedback.

Finally, I have come to believe in the strength of the SOTL approach in higher education. SOTL offers faculty a way to understand their teaching and student learning, as well as, to initiate deep and

long lasting change in both. Pat Hutchings (2000) explains that SOTL is characterized by three factors. She writes, “. . . the scholarship of teaching and learning is deeply embedded in the discipline; its questions arise from the character of the field and what it means to know it deeply” (pg. 6), “. . . the scholarship of teaching and learning is an aspect of practice” (pg 8) and finally, “The scholarship of teaching and learning is characterized by a transformational agenda” (pg. 8). The discipline, practice and transformation are all aspects of SOTL that will continue to impact higher education as we move ahead in the future.

References

- Brookfield, S. (1995). *Becoming a critically reflective teacher*. San Francisco, CA: Jossey-Bass, Inc
- Cerbin, W. (2000). Investigating student learning in a problem-based psychology course. In Hutching, P. (Ed.) *Opening Lines: Approaches to the Scholarship of Teaching and Learning*. The Carnegie Foundations for the Advancement of Teaching. Menlo Park, CA.
- Daley, B., Shaw, C., Balistrieri, T., Glasenapp, K., & Piacentine, L. (1999). Concept maps: A strategy to teach and evaluate critical thinking. *Journal of Nursing Education*, 38, 1, 1-6.
- Daley, B. (1996). Concept maps: Linking nursing theory to clinical nursing practice. *Journal of Continuing Education in Nursing* 27, (1), 17-27.
- Hutching, P. (2000). *Opening Lines: Approaches to the Scholarship of Teaching and Learning*. The Carnegie Foundations for the Advancement of Teaching. Menlo Park, CA.
- Novak, J., & Gowin, B. (1984). *Learning how to learn*. Cambridge University Press.
- Novak, J. (1998). *Learning, creating and using knowledge: Concept maps as tools to understand and facilitate the process in schools and corporations*. Lawrence Erlbaum Associates.