

USING CONCEPT MAPS IN QUALITATIVE RESEARCH

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Abstract. Despite the huge increase in the number of qualitative research studies conducted, using concept maps as a methodological research strategy has received little attention in recent literature. This paper will discuss the connections between qualitative research and concept maps. Additionally, four strategies for incorporating concept maps in qualitative research will be presented along with sample maps for each strategy. Finally, advantages and disadvantages of using concept maps in qualitative research will be discussed.

1 Introduction

Qualitative research as a form of inquiry has grown tremendously in the last decade. The number and quality of qualitative studies in almost every discipline has increased. In addition, sophisticated computerized software programs have been developed to assist with the data analysis process in qualitative inquiry.

The focus of qualitative research tends to be on understanding the meaning imbedded in participant experiences through an open-ended, unstructured and subjective approach (Lincoln & Guba, 1985). The research is most often conducted in a naturalistic setting with a purposive sample (Patton, 2002). The research tends to be holistic, descriptive and focuses on the depth and details of experiences (Denzin & Lincoln, 1998). Data collection methods include interviews, observations, field notes, and documents to name a few (Wolcott, 1994). Data tend to be analyzed through an inductive, ongoing and evolving process of identifying themes within a particular context (Miles & Huberman, 1994). As Creswell (1998) indicates,

Qualitative research is an inquiry process of understanding based on distinct methodological traditions of inquiry that explore a social or human problem. The researcher builds a complex, holistic picture, analyzes words, reports detailed views of informants and conducts the study in a natural setting (p15).

1.1 Challenges in Qualitative Research

Researchers engaged in qualitative inquiry find varying challenges in the process. Often these challenges have to do with the data analysis process. In qualitative inquiry, researchers need to take voluminous amounts of text-based data and reduce that data to a manageable form without losing the embedded meaning. Additionally, qualitative researchers are challenged to make the process they use in data analysis transparent. Often qualitative studies describe the data analyses as a process of reading and re-reading transcripts until themes emerge. This type of description makes it difficult for subsequent researchers to understand not only the analysis process, but to understand where and how the findings have emerged from the data. If readers can not rely on the credibility and trustworthiness (Lincoln & Guba, 1985) of the analysis process, then the findings from qualitative studies tend to become suspect.

Concept maps can provide one strategy to deal with the methodologic challenges of qualitative research. A concept map (Novak, 1998) can be used to frame a research project, reduce qualitative data, analyze themes and interconnections in a study, and present findings. "A concept map is a schematic device for representing a set of concept meanings embedded in a framework of propositions" (Novak and Gowin, 1984, p. 15). Concept maps are created with the broader, more inclusive concepts at the top of the hierarchy, connecting through linking words with other concepts than can be subsumed. Concept maps are an important strategy in qualitative inquiry because they help the researcher focus on meaning. The maps allow the researcher to see participants' meaning, as well as, the connections that participants discuss across concepts or bodies of knowledge. Additionally, the maps support researchers in their attempts to make sure that qualitative data is embedded in a particular context. Since the maps focus on subsumption, progressive differentiation, and integrative reconciliation of concepts (Novak & Gowin, 1984) the research context remain an integral part of the data analysis process. The remainder of this paper will focus on examples of how concept maps can be used in qualitative studies.

2 Mapping and Methods

2.1 Framing Research Projects

Concept maps can be used to frame or plan research projects. For example, the first map shown in Figure 1 was used to plan a research study investigating how the use of concept maps impacted the learning of adult students in higher education over two semesters.

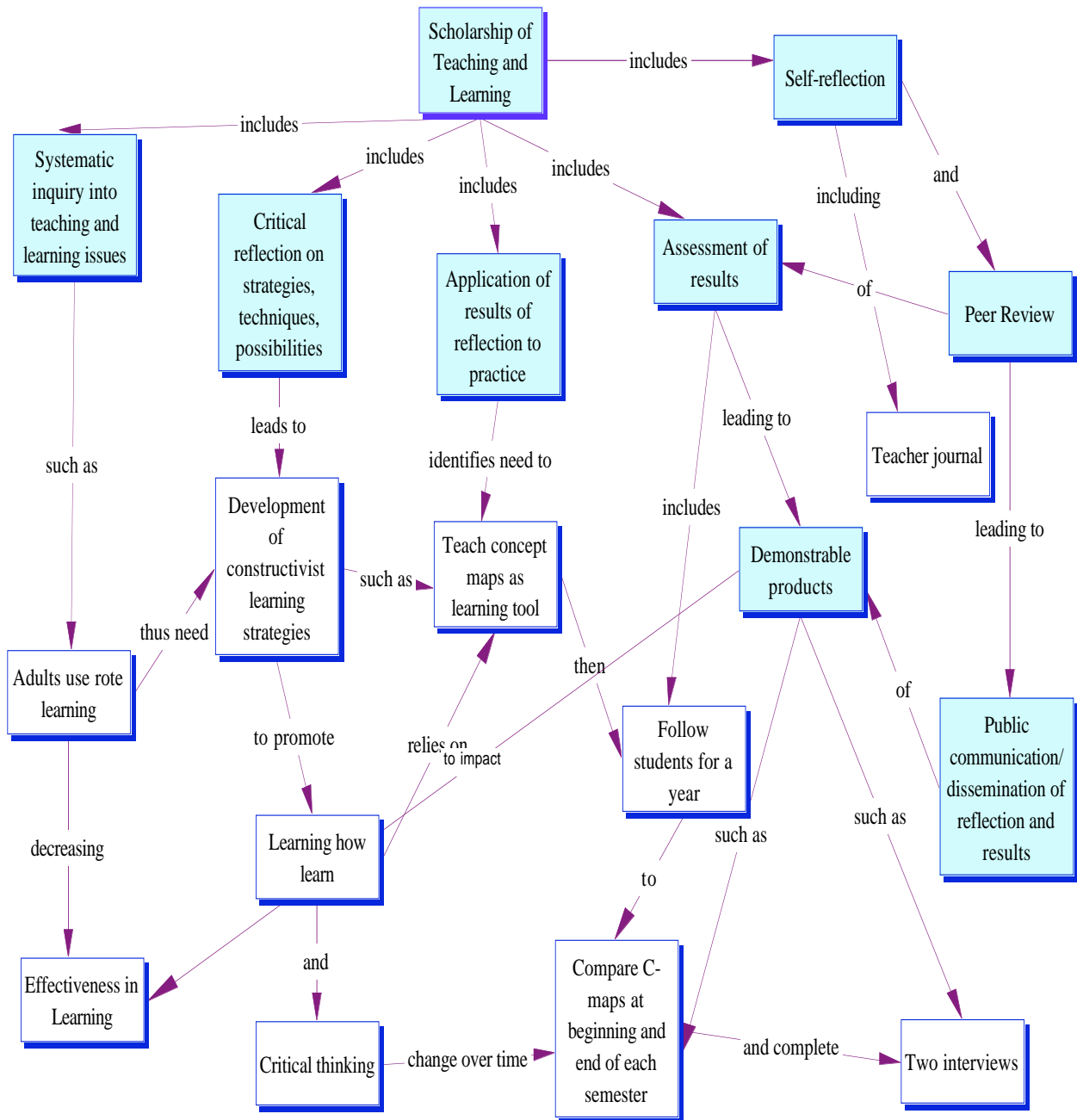


Figure 1: Applying the Scholarship of Teaching and Learning: Understanding Adult Students in Higher Education

Part of the purpose of this research was to link the study to the eight principles of the scholarship of teaching and learning (SOTL). (<http://www.carnegiefoundation.org/CASTL/highered/index.htm>). So in planning the study, these eight principles were presented (note blue concepts) on the concept map and the actual research

project was linked to each of the eight principles (Daley, 2002). This map clearly depicted for other researchers how the SOTL principles were incorporated through out the research project. In planning research projects the maps serve the purpose of helping researchers to link the conceptual framework of the research to the actual research methods.

2.2 *Reducing Data*

One of the strengths of using concept maps in qualitative research is that it allows the researcher to reduce the data in a meaningful way. By using maps it is possible to display an average 20 page interview transcript on a single page. Using concept maps in the data reduction process, allows for the visual identification of themes and patterns. It also allows the researcher to capture meaning of the participant interviews because the maps display concepts in both a horizontal and vertical fashion. It is these linkages that facilitate the process of understanding interconnections and meanings in the data. The vertical linkages display how the participant differentiated concepts and the horizontal linkages display how the participant connected and related different areas of the study.

In addition, reducing qualitative data to a one page concept map can facilitate the process of cross-site or cross-group analysis. Sorting the one page maps by groups or sites can facilitate the process of comparing for similarities or highlighting differences. For example, in a study of how different professionals learn in their practice, concept maps were created of each interview. This allowed researchers to compare how nurses, adult educators, social workers, and lawyers learned (Daley, 2001).

2.3 *Analyzing Themes*

Concept maps also can be used as a strategy to search out and analyze themes in qualitative research. To identify these overarching themes requires that researcher identify interconnections between concepts. If the researcher is searching for specific interconnections, a concept map can be created from the interview transcript that demonstrates these connections. For example, in one study on how professionals learn the researcher was looking for the connections participants made between what they learned in formal continuing education programs and their professional practice. So concept maps were created of each interview the depicted what participants said about their knowledge from continuing education, the context in which they worked and their professional practice.

Figure 2 depicts the connections one participant, a social worker, in this study made. The map displayed here is difficult to read because of the complexity, and yet the interconnections are clear. At the top of this map are the concepts of knowledge, context and professional practice (in blue). The interconnections that the interview participant discussed are displayed in pink. The social worker in this interview had been to a continuing education program on long-term care issues. From the map, one can see that when returning to work she did share the content of the workshop with her supervisor. Additionally, she clarified how she could use this information in counseling clients.

Concept maps can also be used to help create a category or coding system in qualitative research. After the maps are created from each interview or observation, the researcher can go through these maps looking for levels of hierarchy, interconnections and repeated concepts. These items then may indicate emerging themes. The category system created can then be used in conjunction with computerized qualitative data analysis packages. Once the category system is created the actual data can be coded and concept maps can even be linked or tagged to individual data samples. Again this linking and tagging helps to keep the participant meaning and research context central in the data analysis process.

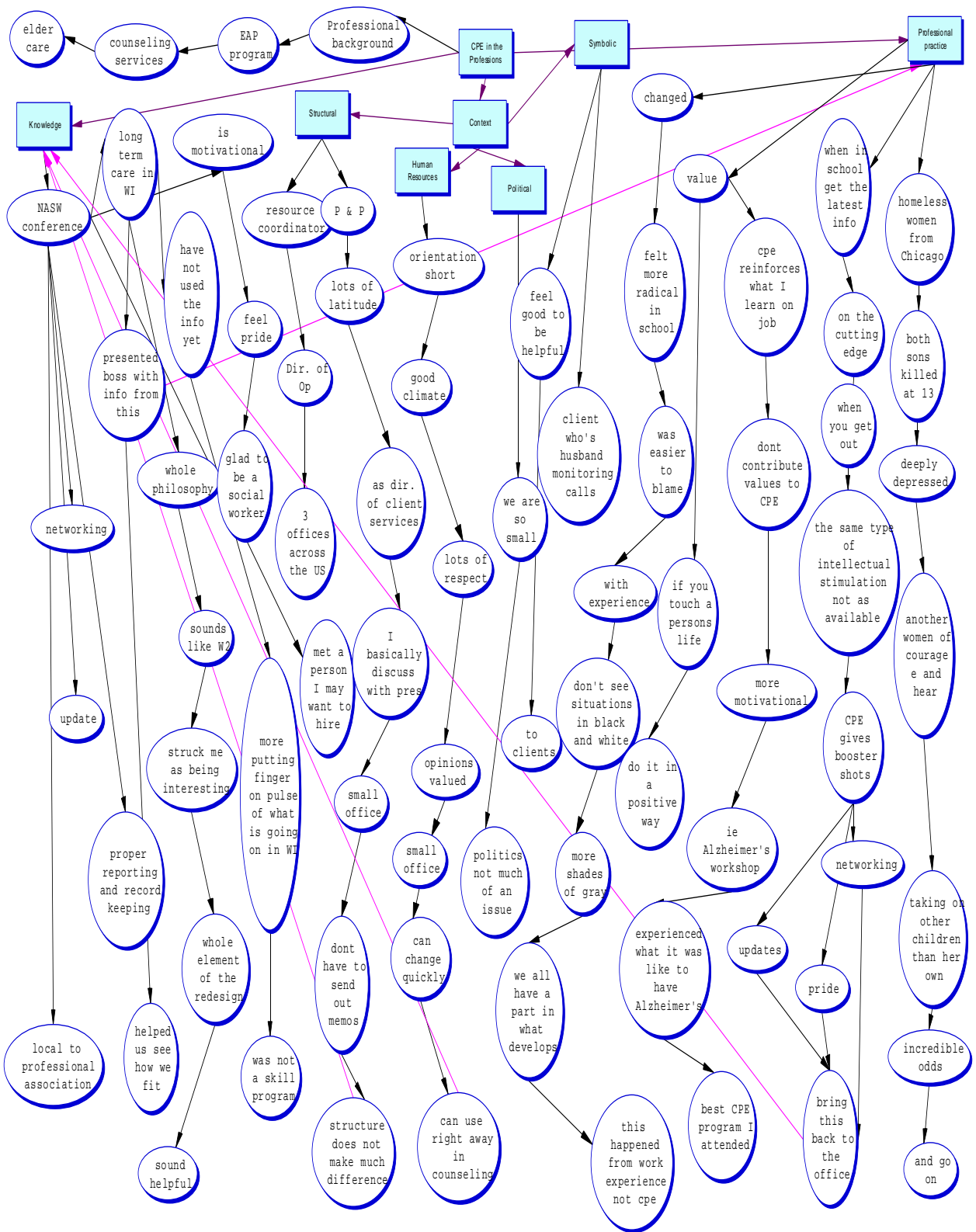


Figure 2: Concept Map of Social Worker Interview Depicting Connections between Knowledge, Context and Practice

2.4 Presenting Findings

Finally, concept maps can be used to present the findings of a qualitative research study. As a graphical display the maps can help readers understand the findings by providing a vehicle whereby the actual data quotes can be connected to larger parts of the study. For example, in a study analyzing the different learning processes of novices and experts, researchers found that novice learning was often contingent on the novices need for

validation, insecurity and fear of mistakes. Novices were still forming concepts in their practice and then when confronted by these feelings, they often described how they just wanted to be told what to learn. The map displayed in Figure 3 succinctly displays these findings.

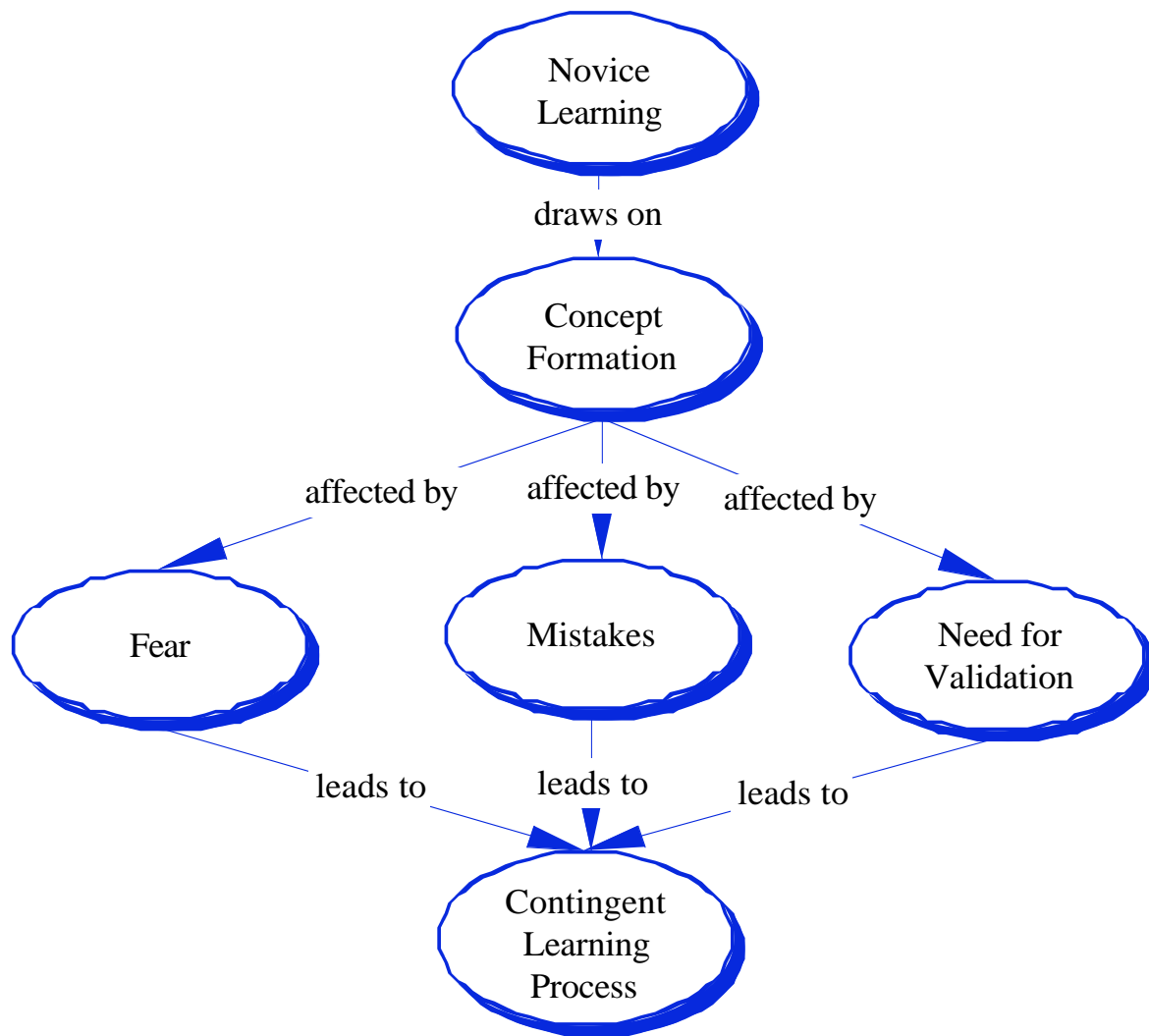


Figure 3: Learning Process of Novices
(Daley, 1999)

In contrast expert learning was found to be a more constructivist process based on an understanding of client need and the practice setting. In Figure 4 it is clear that experts integrate newly learned concepts with their experience through a process of dialogue and sharing (Daley, 1999).

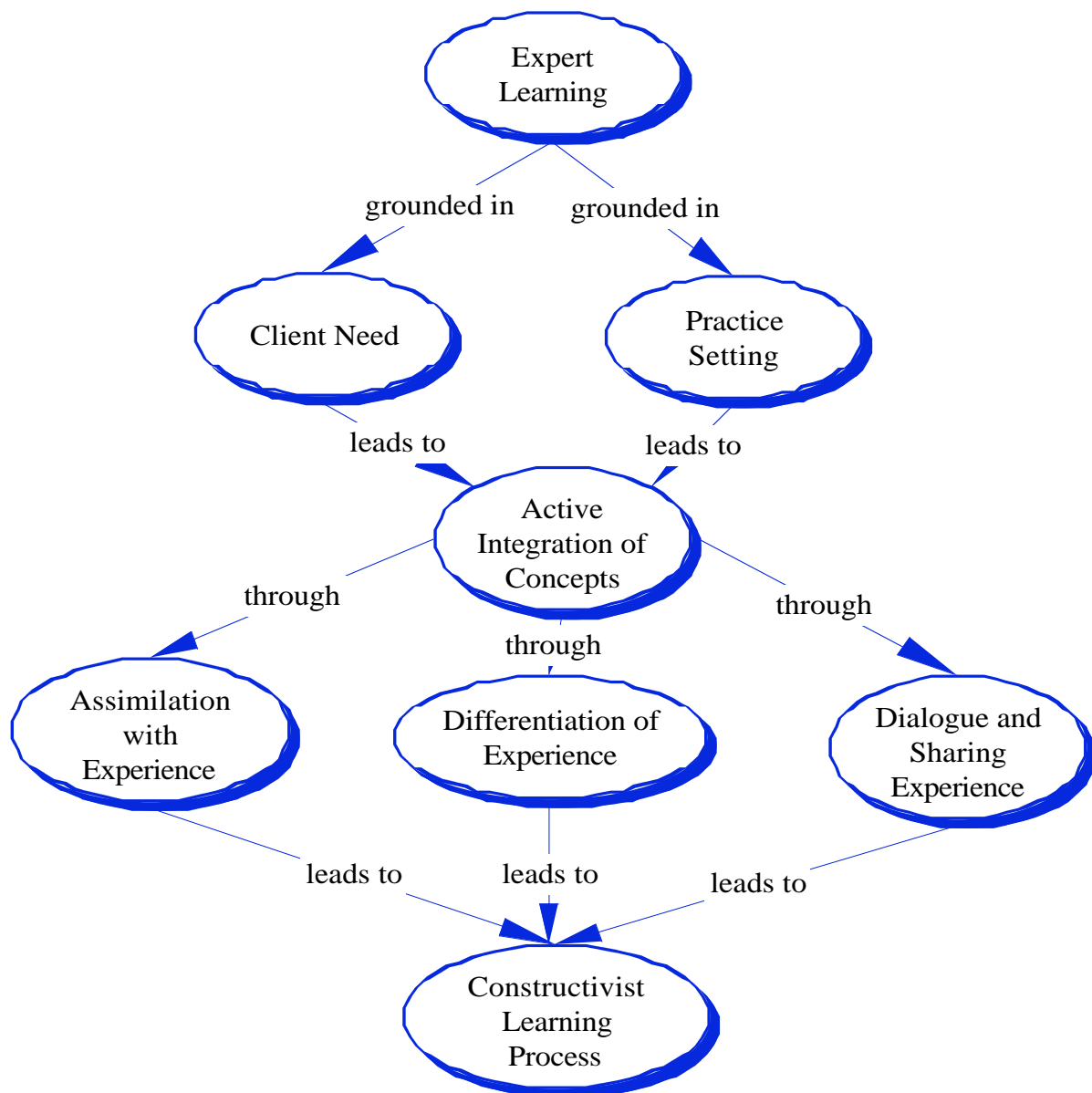


Figure 4: Learning Process of Experts
(Daley, 1999)

By using the maps in Figures 3 and 4, researchers were able to help the reader compare and contrast the findings of this study. The maps allowed for discussion of two clearly different learning processes and graphically displayed the differences for the reader.

3 Advantages and Disadvantages of Using Concept Maps in Qualitative Research

Using concept maps in qualitative research has a number of advantages. First, the maps help researchers to maintain the meaning of the interview within the data analysis. Often when looking at an interview transcript, the richness of the participants meaning can be lost. Because of the interconnections displayed on a concept map this meaning can be maintained. Transcripts tend to represent the spoken language in a linear fashion, where as the maps represent the interview data in an interconnected and hierarchical fashion. This representation is more analogous to the way we think and to the way we actually discuss concepts in an interview format. Concept maps created from interview transcripts allows the researcher to probe the human cognitive structures and then to represent these structures by linking concepts within a framework of propositions. Second, the maps are advantageous in that they support the philosophical underpinnings of qualitative research and they help operationalize this philosophy in the data analysis process. Third, concept maps also help reduce the volume of

the data, display linkages, and facilitate cross group or site comparisons. Additionally, the maps can be returned to participants and participants can be asked to review the map and make sure the researcher is accurately understanding and conveying the meaning of what the participant discussed in the interview. Finally, concept maps are a qualitative data analysis strategy that can be used with other strategies in the same study. For example, the maps can be used to support the creation of coding and categorization systems, as well as the development of matrices.

The major disadvantage of using concept maps in qualitative work seems to be their complexity. The maps can be difficult for participants unfamiliar with the format to read and the linkages may be harder to see as the maps get more and more complex as demonstrated in Figure 2. Because of this complexity, it is most often necessary to use other data analysis strategies in conjunction with the maps. Additionally, the complexity at times makes it difficult for the reader to determine what concepts are of critical importance and what concepts are of secondary importance.

4 Summary

Miles and Huberman (1994) indicate that the data analysis process in qualitative research contains the three sub-processes of data reduction, data display, and conclusion drawing. In this paper it is demonstrated how concept maps can be involved in each of these sub-process, as well as, in thematic analysis and the framing of research projects. One of the biggest advantages of using concept maps in qualitative research is that they can be applied in multiple studies and with multiple kinds of data. Despite the disadvantage of complexity, concept maps can serve as an important advance in qualitative research and data analysis.

5 References

- Creswell J. (1998). *Qualitative inquiry and research design: Choosing among five traditions*. Thousand Oaks, CA: Sage Publications.
- Daley, B. (2002). The Scholarship of Teaching and Learning: Facilitating Adult Learning. *Journal of the Scholarship of Teaching and Learning*, 3,1, 14-24. Available at: http://titans.iusb.edu/josotl/VOL_3/NO_1/daley_vol_3_no_1.htm.
- Daley, B. (2001). Learning and Professional Practice: A Study of Four Professions. *Adult Education Quarterly*, 52,1,39-54.
- Daley, B. (1999). Novice to Expert: An exploration of how professionals learn. *Adult Education Quarterly*, 49, 4, 133-147.
- Denzin, N., & Lincoln, Y. (Eds.). (1998). *The landscape of qualitative research*. Thousand Oaks, CA: Sage.
- Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Thousand Oaks, CA: Sage.
- Miles, M., & Huberman, M. (1994). *Qualitative data analysis: An expanded sourcebook*. Thousand Oaks, CA: Sage Publications.
- Novak, J. (1984). *Learning how to learn*. Cambridge University Press.
- Novak, J. (1998). *Learning, creating and using knowledge: Concept Maps™ as facilitative tools in schools and corporations*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Patton, M. Q. (2002). *Qualitative evaluation and research methods* (3rd ed.). Thousand Oaks, CA: Sage.
- Wolcott, H. F. (1994). *Transforming qualitative data*. Thousand Oaks, CA: Sage.