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Deepening Understanding in Qualitative Inquiry

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Abstract

In this paper the authors describe how the use of multiple methods of qualitative data collection over a two-year period, including interviews, concept maps and journals, and the analysis of data through visual inquiry, categorizing (constant comparison thematic analysis), and connecting (narrative analysis) provided a more comprehensive understanding of the process of evolution in college teachers' perspectives on teaching and learning within a professional development program than would have emerged with only a single method . Concept maps provided an initial visual footprint of teachers' emerging perspectives. Categorization revealed four major patterns across teachers' perspectives. Connecting the data through narrative summaries exposed a contextualized rendition of aspects of individual teachers' perspectives. Each of these three approaches offers a unique lens into qualitative data analysis, and when used together, they clarify important aspects of the phenomenon under investigation.

Keywords

Visual Inquiry, Categorizing Strategies, Connecting Strategies, Professional Development, Teacher Perspectives, Higher Education

Deepening Understanding in Qualitative Inquiry

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In this paper the authors describe how the use of multiple methods of qualitative data collection over a two-year period, including interviews, concept maps and journals, and the analysis of data through visual inquiry, categorizing (constant comparison thematic analysis), and connecting (narrative analysis) provided a more comprehensive understanding of the process of evolution in college teachers' perspectives on teaching and learning within a professional development program than would have emerged with only a single method. Concept maps provided an initial visual footprint of teachers' emerging perspectives. Categorization revealed four major patterns across teachers' perspectives. Connecting the data through narrative summaries exposed a contextualized rendition of aspects of individual teachers' perspectives. Each of these three approaches offers a unique lens into qualitative data analysis, and when used together, they clarify important aspects of the phenomenon under investigation. Keywords: Visual Inquiry, Categorizing Strategies, Connecting Strategies, Professional Development, Teacher Perspectives, Higher Education

Within higher education, teachers' perspectives on teaching and learning have been identified as an important area of investigation (Hativa, 2002; Kember, 1997; Kember & Kwan, 2002; McAlpine & Weston, 2002). This paper describes how when various forms of data are analyzed using a visual inquiry approach (Butler-Kisber & Poldma, 2010) in conjunction with categorizing and connecting approaches (Maxwell & Miller, 2008), the results can be used successfully to track teachers' evolving perspectives on teaching and learning. It reports on the use of various types of data that were collected over a two-year period, including primarily repeated interviews, which were subsequently corroborated by teachers' concept maps and their reflective journals. It shows how these data were analyzed through visual inquiry and through the complementary strategies of categorizing and connecting (Maxwell & Miller, 2008). It demonstrates how visual inquiry as shown through teachers' concept maps helped to uncover and make explicit their emerging thoughts. The procedure of categorizing using the constant comparison approach (Butler-Kisber, 2010; Charmaz, 1998, 2000, 2005; Maykut & Morehouse, 1994) yielded a thorough thematic description of the evolution in teachers' perspectives about teaching and learning. Also, it shows how the use of connecting strategies through a narrative analysis (Lieblich, 1998) that probed the data contiguously, resulted in the production of narrative summaries (Rhodes, 2000), revealing some of the distinctions in individual teachers' perspectives. This paper argues that the use of these multiple approaches to data collection and analysis create a multifaceted way of examining teachers' perspectives, provide a more comprehensive understanding of the data, and increase the persuasiveness of findings.

We situate ourselves in this research process as two experienced higher-education teachers who embrace a critical social-constructivist epistemology (Schwandt, 1994). We believe that knowledge is constructed in social interaction and mediated by language/tools and

that there are multiple ways of seeing, doing, and understanding. We draw from the pragmatists (Clandinin & Rosiek, 2007) in that knowledge is experience and hence inquiry is a way of knowing that emerges from a relational, participatory, inclusive and holistic process that develops over time. Inquiry then, is not just a series of discrete methodological steps, but rather as feminist research has shown (Creswell, 2013), involves an overall way of being in and doing research that is predicated on ethical and inclusionary practices with special attention to those who may be marginalized and/or silenced. We take, too, from critical realists (Maxwell, 2008), the imperative to listen and observe in great detail thereby observing anew with self-conscious reflection. We adhere to postmodern notions with a view to action and social change.

Research Questions

Over the past several decades, teaching has assumed an increasingly important role in higher education. The work of Ernest Boyer (1987, 1990, 1998) and the Scholarship of Teaching movement, as well as changing student needs and the changing landscape in higher education (Nicholls, 2001) have contributed to this shift. These factors, among others, have led to demands for greater accountability in the areas of both teaching and student learning.

Some have described the current teaching situation in higher education as problematic and the need for change as urgent (Charbonneau, 2003; Knapper, 2005). One area of particular importance in relation to teacher professional development concerns academics' perspectives on teaching and learning. Saroyan et al. (2004) define perspective as a conception or belief that can be conscious or unconscious. According to the authors, these perspectives play a critical role in the decisions teachers make about teaching and learning. They act as filters, and in order to understand teaching from the teacher's point-of-view, it is necessary to probe these beliefs (Hativa, 1998). This is especially so in the case of new teachers who often begin teaching armed with little more than their own ideas about teaching and learning. These ideas are based largely on their experiences as learners and they may be faulty (Hativa). In contrast, teachers who hold more sophisticated conceptions of teaching and learning are likely to adopt higher-level approaches that entail more complex views of learning (Trigwell & Prosser, 1996). A number of researchers including Kember (1997), and McAlpine and Weston (2000) maintain that fundamental changes to the quality of teaching in higher education are unlikely to occur without changes to professors' beliefs or perspectives on teaching. The fact that at the college level, in contrast to the pre-college level, few studies have been conducted into teacher perspectives further signals the need to explore this area.

Researchers including Kember (1997) and Robertson (1999) have described an evolution in teacher perspectives from a teacher-centered to a more learner-centered orientation. They posit that such evolutions occur over time and as a result of experience. However, this continuum is often based on data solicited from questionnaires and single interviews with one or more teachers. As a result, the evolution in individual teachers' perspectives is not revealed, but only inferred. In a review of 49 studies on teacher perspectives in higher education, Kane, Sandretto, and Heath (2002) outlined several methodological flaws in both data collection and analysis. No study solicited information from individual teachers on more than one occasion, rendering it impossible to uncover the process, if any, underlying changes in individual teachers' perspectives over time. By conducting repeated interviews with individual teachers over time, the present study sought to investigate the process of change that might be occurring in individual teachers' perspectives. As well, researchers have also posited different time frames for bringing about changes in perspectives on teaching and learning. This study also sought to establish a time frame in which such changes might occur.

The domain of teacher perspectives presents additional methodological challenges. Because thinking cannot be observed it must be inferred, and inferences are usually based on

teachers' unconfirmed self-reports. As well, beliefs exist in a tacit form and are often difficult to articulate (Kane, Sandretto, & Heath, 2002). Dinham (2002) argues for the use of multiple types of data collection in research on teaching in higher education, claiming that different sources of data can play different roles. Denzin (1978) and Patton (1987) have discussed how different types of data can show convergence, or triangulation, and reveal complementary dimensions of the same phenomena. Also, they can show divergence in a study, which can signal something very important is in need of further exploration. Although interviews are often the primary source of data collection in the area of teacher perspectives, other methods including reflective journals and concept maps can be used to supplement primary data. Kember et al. (1999) have demonstrated how reflective journals can reveal an evolution in teacher thinking. Concept maps, defined by Maxwell (2005) as a visual display of a phenomenon that is being studied, represent an interesting alternative to traditional, linear ways of viewing text. Not only do they establish a visual footprint of thinking as it emerges in its formative stages (Butler-Kisber & Poldma, 2010), but also provide a convenient and permanent record of early thinking that researchers and participants can easily revisit. Visual modes of inquiry offer a unique lens onto the data and should be considered as an important component of data collection. According to Maxwell (2005), the triangulation that results when additional sources and approaches for data collection are used can provide a broader understanding of the participants' experiences, reduce the chances of producing biased or limited results that might occur if only one data source were used, and increase the trustworthiness of the findings. Kane, Sandretto, and Heath (2002) reported several concerns with data gathering across the 49 studies on teacher perspectives they reviewed. In several cases, methods were unreported or difficult to discern. No single study integrated more than one method of data gathering and analysis, prompting the researchers to suggest that the complexity of teacher thinking needs to be investigated through multiple methods and over time.

Qualitative researchers, and in particular constructivists, argue that there are multiple ways of doing and understanding (Creswell, 2003, as cited in Butler-Kisber & Poldma, 2010). In addition to integrating multiple sources of data collection, evidence suggests that data analysis can also be enhanced through the use of more than one analytic procedure. For example, concept maps, which are often used in the early stages of a research process, can serve as a way of documenting emerging, baseline thinking. They can also help to expose and make explicit, tacit or hidden aspects of both understanding and process (Butler-Kisber & Poldma, 2010, p. 1 of 16) and thereby uncover the unconscious aspect of perspectives described by Saroyan et al. (2004). For example, they can be used to show how concepts are linked to each other, and as a way of exposing the assumptions that underlie thinking. By making the implicit explicit, such visual modes of inquiry move thinking to a deeper level. As well, concept maps can be compared at different times to track the evolution of beliefs (Deshler, 1990). Textual modes of analysis that include the complementary approaches of categorizing and connecting data (Maxwell & Miller, 2008) offer new insights. The authors claim that while each of these two procedures provides a unique analytic lens onto the data, when used individually they present certain limitations. For example, contextual relations are lost during a thematic analysis, and the use of connecting strategies only can lead to an inability to compare two things in separate contexts. Together they provide a useful distinction that helps to clarify important aspects of qualitative data analysis. As well, the individual voice, which is suppressed when data are coded, resurfaces when a connecting strategy is used. We argue that when data take turns being foregrounded and subsequently backgrounded, and are examined through both visual and textual approaches, a deeper understanding is made possible.

The idea of multiple representations has been conceptualized in different ways by qualitative researchers. Traditionally, the term triangulation has been used to refer to the inclusion of multiple data sources and research methods (Maxwell, 2005). Triangulation has

been shown to increase the trustworthiness of the data, and according to Kagan (1990), including such multimethod approaches "makes it more likely to capture the complex, multifaceted aspects of teaching and learning" (p. 459). Conle (1996, 2000) suggests that in lieu of the term triangulation in qualitative inquiry, the idea of resonance provides a more useful metaphor. Resonance occurs when what is represented is sufficiently and particularly detailed that the work resonates with the experiences of the reader and provides new insights and/or understandings as a result. Resonance is often evident in narrative analysis (Butler-Kisber, 2010). As social constructivists who embrace a myriad of ways of seeing, doing and understanding, rather than triangulation, we prefer the term crystallization, popularized by Laurel Richardson (2008) for a way of conceptualizing reality. By crystallization we do not suggest a rigidness, or something that becomes solid, concrete or permanent. In contrast to this and the two-dimensional image of the triangle discussed above, the crystal is a prism that reflects an infinite variety of shapes and patterns, depending upon one's vantage point or angle of approach. In examining the phenomenon of teacher perspectives through a variety of lenses including multiple methods of data collection and both visual-spatial and textual methods of analysis, we portray reality, in line with Richardson, as deep and complex, but only ever partially understood.

This study investigated college teachers' changing perspectives over time, in response to a professional development program, the Master Teacher Program (MTP), in which approximately 150 Anglophone college teachers in Quebec were enrolled. The overarching question that guided the research was

> *How does reflecting on teaching and learning throughout the first four courses which cover a two-year period in a professional development program (MTP) contribute (or not) to teachers' changing perspectives on teaching and learning?*

More specifically, we explored the following questions:

- *What are the commonalities (if any) among teachers' perspectives on teaching and learning that emerge from the data?*
- *How do teachers understand these commonalities?*
- *What are the distinctions (if any) related to individual teachers' perspectives on teaching and learning that emerge from the data?*
- *How do individual teachers understand these distinctions?*

Since the purpose of this article is to show how methods of data collection and analysis were used to reach a deep understanding of teachers' perspectives, a brief summary of the main findings will be presented in the following section. This will be followed by a thorough exploration of the methodology.

Summary of Main Findings: Four Patterns and Three Dimensions

Maxwell (2005) has described concept maps as a "picture of the territory you want to study" (p. 37, as cited in Butler-Kisber, 2010). In this research, concept maps not only provided a visual footprint of teachers' initial thoughts on effective teaching, but also led the way into data analysis. They were consulted regularly and helped to inform findings that emerged throughout the process of coding the data and constructing the narratives, as summarized below.

An analysis of approximately 25 hours of coded interviews of the six participants across a period of 14 months revealed four major patterns or phases. These patterns were represented through the four metaphors of *awakening, stretching, exercising, and shaping* (Kerwin-Boudreau, 2009, 2010b). After coding the first set of interviews, two common themes emerged: participants reported that they had become aware of their original perspectives on teaching and learning which placed the teacher in a central role, and these perspectives were beginning to shift. The metaphor of *awakening* provided a way of thinking about what became the first major pattern. Findings that emerged from the second set of interviews indicated that teachers were more aware of the learner's role, but expressed difficulty in linking theories of learning with their classroom practice. This phase was represented through the metaphor of *stretching*. An analysis of the third set of interviews, which took place during the second year of the research project, revealed that teachers were beginning to experiment with new instructional strategies in their classes. They had begun the leap from theory to practice and hence this phase was represented through the metaphor of *exercising*. The fourth set of interviews indicated that teachers were beginning to assemble the pieces of the teaching/learning puzzle. They expressed a new appreciation for the meaning and purpose of assessment. Because they were beginning to demonstrate a more integrated understanding of the interdependent roles played by teacher, learner and curriculum, this phase was referred to as *shaping*.

In addition to coding the data, findings were also analyzed in a more contiguous fashion. Narratives were constructed for three of the participants (i.e., a new teacher, one with five years of teaching experience, and a 25 year veteran teacher), based on their interview data. The four patterns discussed above appeared, to greater or lesser extents, in the teachers' stories, and in particular in the case of the new teacher. Further, the three narratives provided evidence of movement from a teacher-oriented perspective to one that placed students at the center of the learning process. The three narratives confirmed findings that had emerged from the coded data, that is, that a change in teachers' perspectives on teaching and learning preceded changes in their classroom practice. Interestingly, although concept maps had been collected during the very early stages of the research process, the changes that were evident between the first and second map that each teacher produced, foreshadowed the change in perspectives that they were only able to articulate through the interviews, in the second year of data collection.

Thus, findings from the triple processes of visualizing (through concept maps), categorizing (through coding interview data) and connecting (through constructing narrative analyses) converged to reveal similar patterns. In line with research by others such as Kember (1997), Kember and Kwan (2002), and Samuelowicz and Bain (2001), teachers' perspectives had shifted from teacher to learner centeredness. Furthermore, the results of this study revealed that this shift was marked by three major dimensions: increased awareness of the learner and the learning process, increased intentionality to align the curriculum, and increased self-knowledge. In terms of increased awareness of the learner, teachers reported a greater appreciation for individual learning styles and a commitment to the idea that learning can only take place if and when the student is actively involved in the process. The second major dimension, increased intentionality to align the curriculum, was revealed as teachers spoke increasingly of matching course objectives, learning tasks and assessments in an effort to "demystify the curriculum" for their students and promote student achievement. An interesting set of findings emerged with respect to teacher identity. Teachers reached new insights about themselves as educators. They spoke of themselves as both disciplinary and pedagogical experts and reported enhanced confidence and greater enjoyment of teaching.

Finally, reflection on practice over time emerged as the primary factor that ignited the process of evolution in teacher perspectives. Reflection is what allowed teachers to link theory with practice and to deconstruct what was happening in their classroom, thereby affording them critical insight into their practice. As well, as their knowledge base increased, their reflections

became more grounded in theory. Based on teachers' self-reports, findings also showed that changes in perspectives preceded changes in classroom practice. It took at least one year for perspectives to be sufficiently integrated before teachers reported adjustments to their classroom practice (Kerwin-Boudreau, 2010a). In the following section, we present an in-depth exploration of the methodology, in order to delineate and illustrate how the research process unfolded.

Methodology

Participants

After presenting the parameters of the research project to a cohort of 21 teachers who were enrolled in the MTP, six female college teachers volunteered to participate in the study. These participants teach at various Anglophone colleges (known as CEGEPS in Quebec), have a range of teaching experience from less than one year to 25 years, and teach in different programs, including two in the Sciences, two in the Social Sciences and two in Career Programs. Hence, they satisfy criteria of both heterogeneity and representativeness or typicality, as outlined by Maxwell (2005). To guarantee confidentiality they were each given a pseudonym from A to F (i.e., Anne, Barb, Carly, Deana, Ella and Fran). Even though this sample of volunteer recruits is self-selected as opposed to deliberately chosen, according to Maxwell they represent a purposive sample, in that they were able to provide us with the information necessary to answer the research questions. Prior to the commencement of data collection, this study received approval from the Research Ethics Board of McGill University.

Data Collection

The primary source of data consisted of four interviews, which were conducted with each of the six college teachers as they completed the first four courses in a professional development program, the MTP. This was followed by a fifth retrospective interview with each participant. A total of 25 hours of interview data were collected from the six participants. These interviews were carried out in a semi-structured fashion (Seidman, 1998). Student products including two concept maps and reflective journals over two years were also gathered and used to corroborate the findings that emerged from the interview data. As well, analytic memos and contact summaries as outlined by Miles and Huberman (1994) were used to promote reflexivity.

Data Analysis and Results

Although data analysis in qualitative research does not occur in discrete steps but rather as an iterative, interrelated process, for the purpose of this discussion it will be presented primarily in a linear fashion.

The two concept maps that participants produced early in the study became an important repository for their emerging thoughts on teaching and learning. These maps were consulted throughout the entire research process, from coding the data to establishing patterns and thinking metaphorically, to constructing the narratives. They enabled us to move from linear to spatial representations and back again. As recommended by Butler-Kisber and Poldma (2010), these maps were not viewed as independent forms of analysis but rather read alongside textual analysis. The juxtaposition of the verbal and the visual allowed us to reach new insights and move to a deeper level of understanding.
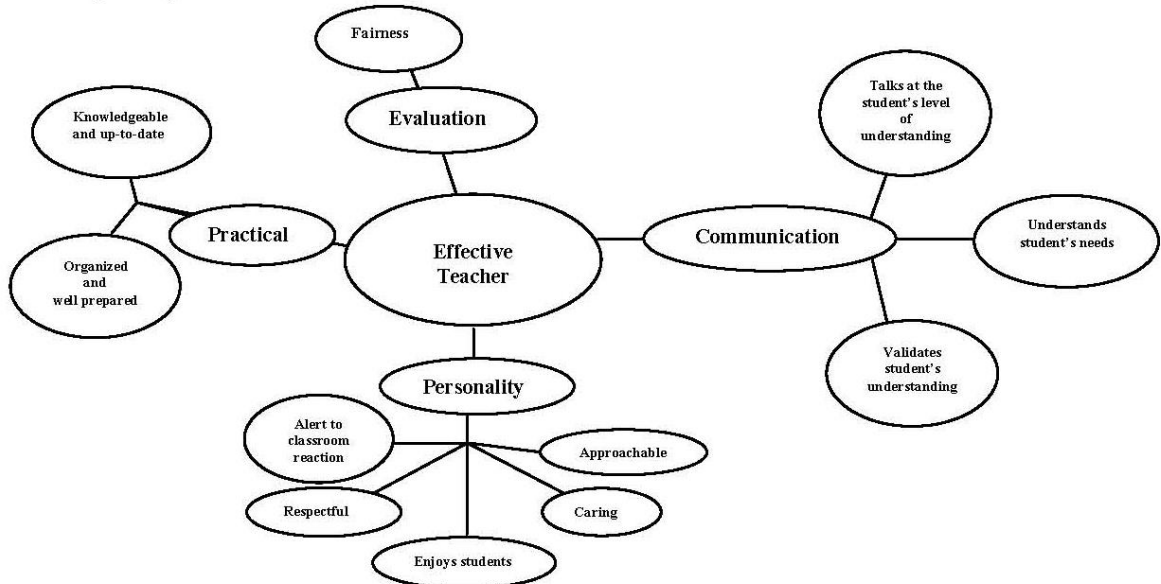
A comparison of the two maps, shown below, illustrates that even early on in the study, participants' perspectives were beginning to shift. What is noteworthy is that in Deana's first map, the emphasis is on teacher characteristics and personality and little reference is made to the learner. While teacher characteristics such as disciplinary knowledge still appear in her second map, constructed a few months later, there is also evidence of a much greater awareness of teaching with the learner in mind. Assessment features prominently as does course design. The shift from teacher to learner-centeredness appears to have begun. As well, this shift is evident in Deana's commentaries that accompanied each map. For example, at the end of her first map Deana wrote:

> An effective teacher is one who knows the subject, who communicates with the students and who cares about the students. As long as the teacher is well prepared, then the students are supposed to learn. There is no notion of learning strategies. Students are expected to absorb the knowledge of the teacher by osmosis. (Deana, commentary, September 2005)
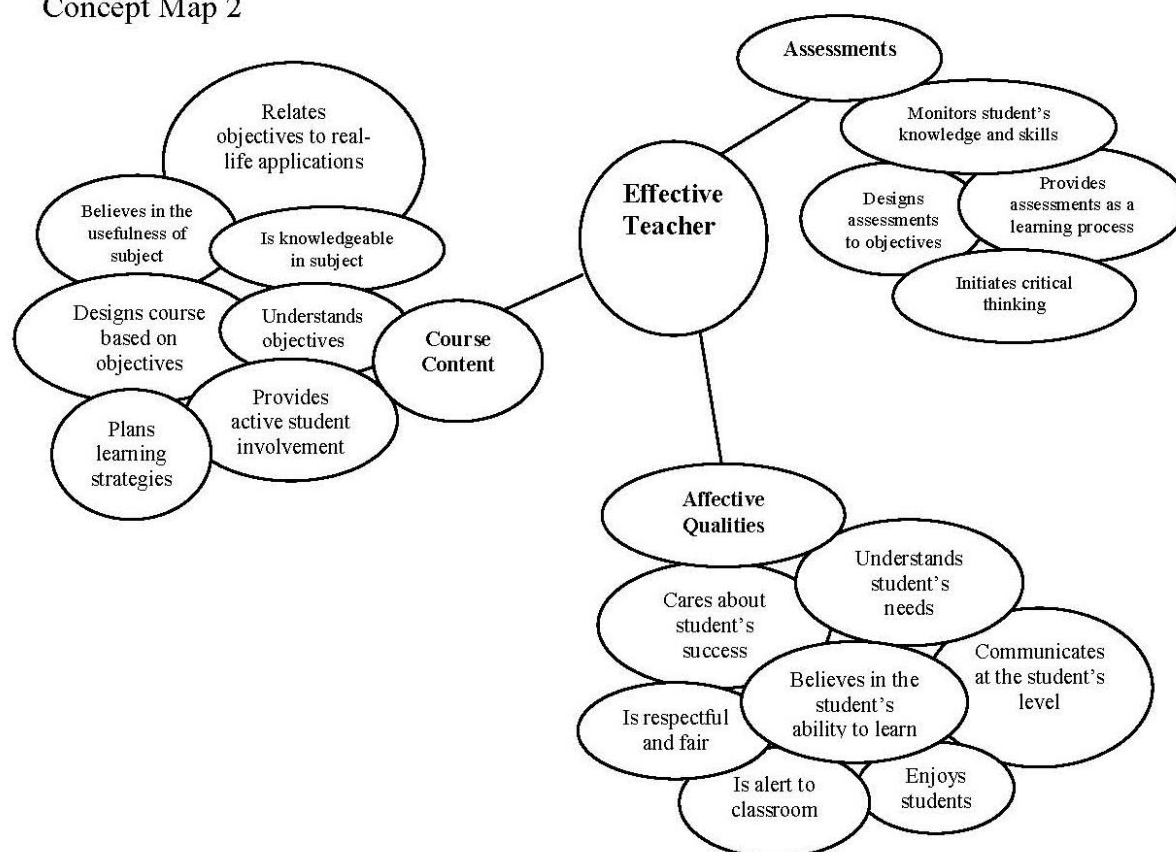
Two months later, after constructing her second concept map, Deana wrote, "The effective teacher is able to design a course where objectives are met through student involvement and learning activities."

During our first interview when I showed Deana her two maps and her related commentaries she stated, "These [ideas] are seeds. I am still not sure how to do this." It would appear that these maps represented an ideal that participants were striving for, but had not yet achieved. Deana's comment and the visual representation of her ideas foreshadowed the fact that changes in instructional practice would take time and would not take place until perspectives had become firmly entrenched.

Concept Map 1

Concept Map 2

In addition to the concept maps, reflective journals that participants completed over the two years of the MTP served as an additional way to substantiate the findings that emerged from the interview data. Although the 360 pages of journal entries were not analyzed in great depth, they were read and this information helped to contextualize the process that was unfolding. For example, in her second interview, Deana had made rather global references to developing new vocabulary and expanding her knowledge of how students learn. In a journal entry she wrote at approximately the same time, she elaborated upon this:

> The theoretical framework offered by Baxter-Magolda is perfect for my students. My first-year students were absolute learners who were indiscriminately absorbing information. Some of my second-year students were transitional learners who had started to understand the concept. (Deana, course 2, journal 3)

Journals are an integral part of the MTP and initially participants reported difficulty articulating their thoughts on teaching and learning through this medium. However, as their knowledge base and time spent in the professional development program increased, their journal reflections became more sophisticated and showed more evidence of linking theory with practice. For example, in year two, there was evidence in journal entries that problems in the classroom were increasingly viewed as challenges that could be overcome. Journals helped to corroborate findings that were emerging in the interview data that identified reflection as a key element that ignited changes in perspectives.

Patton (1987) refers to the period immediately following an interview as critical for analysis. The contact summary sheets, a synthesis of key findings that were completed soon after each interview, became a repository for valuable first impressions. Had these initial

insights not been recorded, they most probably would have disappeared. Furthermore, writing analytic memos throughout the process of data collection and analysis helped the researcher remain aware of assumptions or biases that might affect data collection and interpretation. The following excerpt from an analytic memo shows how the interview process needed to be adjusted:

> The next time I meet with Deana I have to comment less, summarize less, and listen more." (Analytic memo, June 22, 2006)

The process of data analysis was not always smooth and predictable. Analytic memos were also used to reflect on outliers that sometimes emerged, that is, unusual or contradictory chunks of data that did not appear to fit in with general patterns. Outliers were set aside momentarily and in some cases they foreshadowed major themes that emerged later. For example, the notion of the teacher as caregiver surfaced as an outlier while categorizing the first set of interviews. The notion of caring reappeared as a significant theme in Fran's narrative below entitled *Learning in Community:*

> They always knew I cared about them. [What's different is] they care about each other more; they care about their [learning] more. Caring and investment are a part of it. There is a sense … I think it feels good for everybody to want to be there. They carry that with them and that is what learning should be.

Analytic memos also helped to inform the emerging data. Images sometimes emerged while the researcher was engaged in activities other than writing. The following excerpt illustrates how the metaphor of awakening surfaced as the researcher attempted to identify a theme or process to represent what participants had experienced during the first set of interviews:

> My data are never far from me! As I was swimming today, …suddenly it came to me. The image of someone awakening (as from a deep sleep) emerged…It's as if they've been roused or shaken and now they're beginning to see things in a whole new light. (Analytic memo, July 5, 2007)

In summary, while concept maps provided an initial window onto teacher thinking and helped to make implicit ideas more explicit, a variety of additional sources of information including teachers' reflective journals, as well as researcher tools such as analytic memos, contact summaries and the analysis of outliers provided a rich source of data, helped us broaden the conceptual base and ultimately increased the credibility of the findings.

To further provide a more comprehensive understanding of the data and minimize the possibility of distortion, this analysis also involved the complementary processes of categorizing and connecting (Maxwell & Miller, 2008). Data were categorized using the constant comparison method, as outlined by Maykut and Morehouse (1994), and Charmaz (1998, 2000, 2005). This involved unitizing the data into segments of written text and subsequently expanding and collapsing these categories to produce a number of overall themes that could account for these data. This process is reductive and decontextualizes data, but it allows a researcher to see commonalities across the interviews of different participants.
The constant comparison method began with the identification of relevant chunks of data. In turn, these chunks suggested analytic categories. For example, the following chunk of data from the first set of interviews suggested the category of becoming unsettled:

> I remember my first semester. The students were not doing well on their tests and I could not understand why. I was well prepared and I thought I was doing everything right. But the students were not learning. (Deana, interview 1, June 2006)

It was through further reflection that the analytic categories of hanging on, becoming unsettled, and shifting that emerged from the first set of interviews were collapsed into the metaphor of *awakening*.

As previously discussed, four major patterns or phases representing teachers' evolving perspectives on teaching and learning emerged as a result of categorizing the interview data. Through further reflection these four patterns were represented through the four metaphors of *awakening, stretching, exercising, and shaping*. As thematic pieces of a process, these four images that became metaphors provided a way of thinking about how the data related to each of the four sets of interviews could be collapsed. These metaphors also enabled us to uncover connections between the categories. Through this, they exposed the process underlying changes over time in the teachers' perspectives.

Furthermore, evidence for the four major patterns was corroborated by teachers' concept maps and their reflective journals. There were indicators early on in these data sources, and in particular in participants' concept maps and the commentaries that accompanied these maps, that teachers were beginning to challenge previously held beliefs about teaching and learning, thus supporting the phase of *awakening*. For example, this shift is evident in Deana's concept maps and the related commentaries, cited above. Crosschecking sources, from visual to textual representation and back again, helped confirm the emerging patterns.

While the procedure of categorizing enabled us to flatten the data in order to get a sense of emerging patterns across the six cases, the complementary procedure of connecting allowed us to analyse the data contiguously in order to get at the depth of individual experiences and nuances across cases. The methodology of holistic content analysis as outlined by Lieblich (1998) and Seidman (1998) was used to identify major themes for the narratives. The narratives were constructed in the first person, using an adapted version approach of "ghostwriting" in which "researchers create images of others and also enter those images" (Rhodes, 2000, p. 511). This approach involves repeated re-readings of the transcripts, the use of a general narrative structure to create the narrative, and the incorporation of verbatim text wherever possible to create a "written narrative congruent in feel and content to the discussion that transpired in the interview" (p. 518). Therefore, using each participant's own words as much as possible, the narratives were composed as though each participant was writing it as part of her autobiography. Once completed, the narrative was sent to the participant for review. The final version was a jointly constructed product.

Three of the participants with varying levels of teaching experience were selected and narrative summaries were constructed. The procedure of holistic content analysis involved both logic and intuition. Briefly, the participant's transcripts were reviewed and relevant sections pertaining to the underlying theme (i.e., the participant's perception of her role in the classroom) were extracted. Through repeated reading, patterns began to emerge and these became the lenses through which the stories were crafted. The participant's own words recorded during the interviews were used as much as possible, and the narratives were constructed using the first person to retain the authenticity of each account. Finally the narratives were sent to each participant for a member check and their suggestions were integrated into the final product. The narratives thus became negotiated texts. This confirmation by the participants corroborated our findings and increased the confirmability of the study. The three narratives, entitled*, The Active Resistor, Learning as a Student, and*

Learning in Community revealed important distinctions linked to the individual participant's perspectives on teaching and learning.
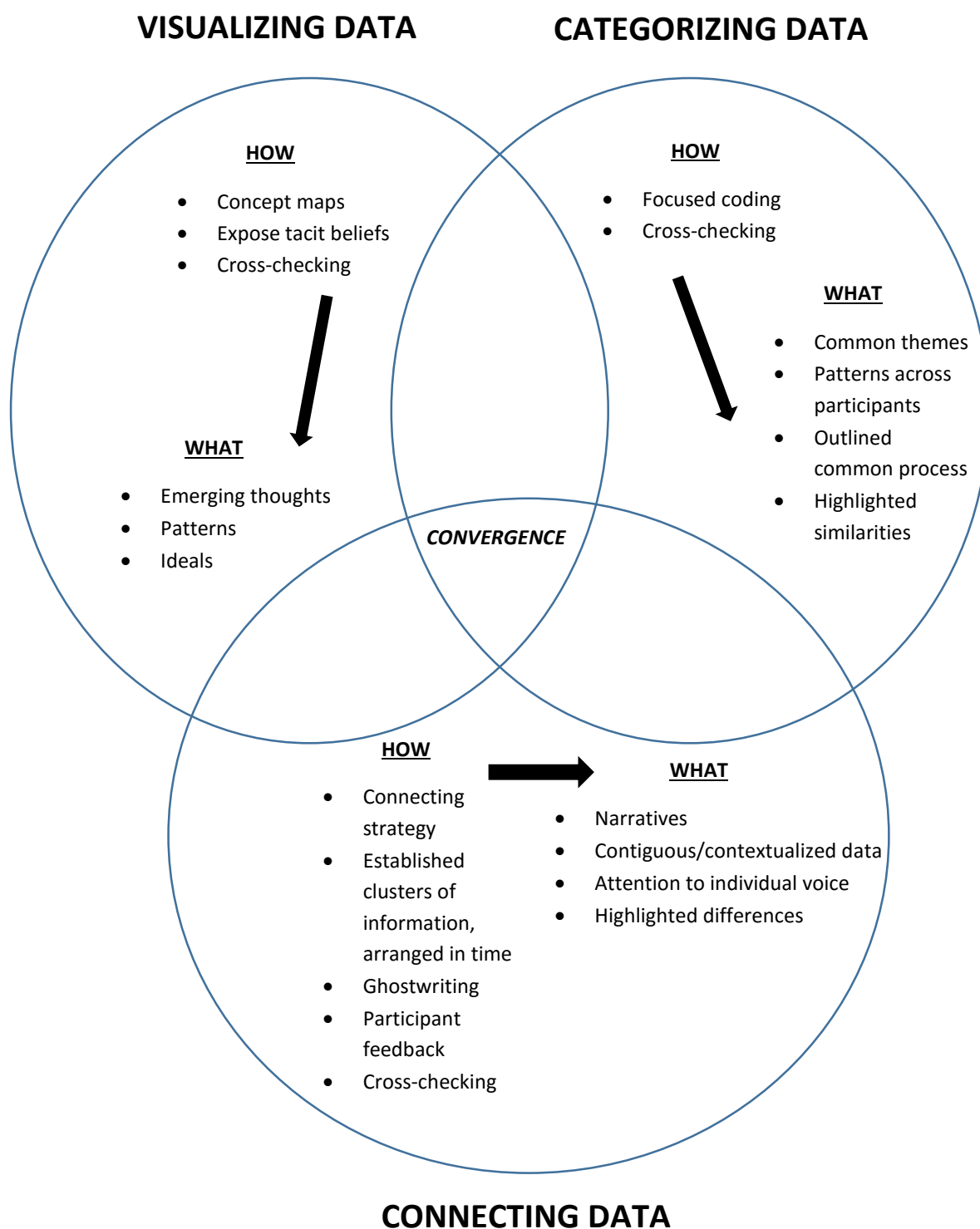
More contextualized factors related to teaching experience and disciplinary background also emerged in the narratives. For example, although evidence for the four major patterns appeared in the three narratives, the new teacher provided evidence of her progress through explicit stages of changes in perspectives.

> First I had to get all this new knowledge. Then I had to take ownership for it by connecting it to my discipline. I resisted this step. Finally, after careful planning, I tried new strategies. (Deana, narrative, *The Active Resistor*).

In contrast, the more experienced teacher showed a faster rate of progression through the four patterns. These distinctions provided a deeper understanding of how the process of change in perspectives was unfolding for individual participants. This difference would not have emerged through the use of categorizing procedures only.

Conclusions: Deepening Understanding through Convergence

Results from visualizing, categorizing and connecting approaches converged to reveal a shift in perspectives from a teacher-centered/content-focused orientation toward a student-centered/learning-focused orientation. Each of the analytic procedures yielded a distinctive outlook onto the data. Together they provided a more comprehensive understanding of the phenomenon under investigation. It is at the intersection of these three rich analytic procedures where our understanding of teacher perspectives deepens and crystalizes. Just as a kaleidoscope uses light and mirrors to reflect objects and create patterns, these methods also took turns, moving from the visual to the textual and back again, backgrounding and foregrounding particularities in the individual teacher's stories as well as patterns across the participants. What one method suppresses the other exposes, and it is in the juxtaposition of one lens against the other that the abundance of data is revealed. In tandem, the three methods cooperate to provide a more holistic and informed outcome. The visual below depicts the complexity that emerged through these three analytic procedures. In particular, it outlines methods (the how) that were used to uncover the data for each of the three analytic approaches of visualizing, categorizing and connecting, and findings (the what) that subsequently emerged through each lens. The intersection depicts the convergence that resulted, leading to deepened understanding.

VISUALIZING DATA   CATEGORIZING DATA

HOW

- Concept maps
- Expose tacit beliefs
- Cross-checking

HOW

- Focused coding
- Cross-checking

WHAT

- Common themes
- Patterns across participants
- Outlined common process
- Highlighted similarities

WHAT

- Emerging thoughts
- Patterns
- Ideals

CONVERGENCE

HOW

- Connecting strategy
- Established clusters of information, arranged in time
- Ghostwriting
- Participant feedback
- Cross-checking

WHAT

- Narratives
- Contiguous/contextualized data
- Attention to individual voice
- Highlighted differences

CONNECTING DATA

From a methodological point of view, this study is unique in a number of ways. First, it combined both visual and textual forms of data collection and analysis to uncover the process underlying change in teachers' perspectives over time. Concept maps collected early in the program exposed teacher thinking in its emergent, idealized state. They provided a map of the terrain to be explored and were revisited regularly. Serving as an important interpretive tool, concept maps helped to confirm the identification of emerging patterns and to make explicit, teachers' tacit or implicit beliefs. The process underlying change from teacher to learner-centeredness was also thoroughly investigated through categorizing and connecting

procedures. Repeated, semi-structured interviews with each of the six college teachers over time revealed a process underlying change in perspectives through four patterns and three major dimensions. The representation of these four patterns through metaphors helped to further unearth the connections between categories and expose the process underlying change. While much of the previous research based on single interviews has featured summative snapshots of teacher perspectives, this methodology of repeated interviews over time provided a well-documented, explicit, and formative picture of the evolution of teacher beliefs. By using a number of methods of data collection and by studying participants over an extended period of time, this study has produced more comprehensive, explanatory research findings. Second, a systematic audit trail was established in this study. Processes related to participant selection and data collection and analysis were clearly outlined. By taking these steps, the methodological drawbacks reported in many of the earlier studies on teacher perspectives in higher education (see Kane, Sandretto, & Heath, 2002) have been avoided. In summary, the convergence of results that emerged from these three analytic approaches has increased the credibility of the findings. Together they provided a more holistic and comprehensive understanding of teacher perspectives that would not have been possible if only one procedure had been used.

There is much currently being written about "mixed methods" in quantitative work, which means the mixing of both quantitative and qualitative methods (Creswell, 2013). We would suggest that more attention should be given to the mixing of qualitative approaches, such as described here. Maxwell and Miller (2008) first introduced the idea when discussing the complementarity and richness of understanding that occurs when thematic and narrative approaches are used. As mentioned, thematic approaches strip away context, but allow researchers to find commonalities in experience among participants, which gives breadth to the work. Narrative inquiry retains context and allows the researcher to further particularize experiences, which adds a depth to the interpretation of results. We would argue that other forms of analysis and representation in areas of, for example, poetic, performative, visual and auditory inquiry, when combined in some way, have the same potential, and might add a novel dimension of complementarity that is worth exploring.

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