EDUCATORS' BELIEF CHANGE IN A SITUATED LEARNING ENVIRONMENT

by

CHRISTA HARRELSON DEISSLER

(Under the Direction of Michael A. Orey)

ABSTRACT

The objective of this study was to understand four educators' beliefs about the nature of learning and purpose of education before and after participation in an educational theory class that focused on theories related to the situated perspective. For the purpose of this study, the situated perspective includes social and educational theories of learning that focus on contextually-based, authentic learning that occurs within a specific setting. The class was designed to provide an opportunity for teachers to both study the theories behind the situated perspective and experience learning from the situated perspective. The situated learning experience took place through the educators' participation as educational interns with a non-profit whale conservation organization that provides education on-board sight-seeing trips with a commercial whale-watching company. Through this internship, educators were learning about whales, their environment, and issues affecting their survival. During the week that this situated learning experience was taking place, educators were also involved in formal class sessions and reflection sessions that focused on both the experience and the relevant supporting theories. Using an ethnographic case study design and a narrative analysis approach, four case studies are presented along with analysis in respect to the theoretical frameworks of conceptual change theory and transformational learning theory.

INDEX WORDS: Situated Cognition, Situated Learning, Communities of Practice, Epistemology, Epistemological Belief Change, Transformational Learning

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DEDICATION

For Grandma Christine, who should have been the first doctor in the family,

and

For Momma, who was my first teacher.

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How does a person write this section? There are so many people to thank that I don't know where to start. (Is my Theatre background haunting me, or does this sound like the beginning of a bad Academy Awards acceptance speech?)

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the rest of the participants in the Whale Class of 2006, thank you for letting me be a part of your community.

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CHAPTER I

INTRODUCTION

What does it mean to believe? According to Merriam-Webster (1997), to believe is “to have a firm conviction about something: to accept as true.” For educators, their firmly held convictions about the nature of learning and knowledge directly affect the choices they make in the classroom. Often, educational theory courses and professional development models encourage teachers to adopt teaching practices that are different from their current practices, without addressing their existing beliefs about learning and knowledge. There is evidence to suggest that if teachers’ beliefs are not supportive of the particular theory that is being encouraged by the course or professional development model, there is very little chance for success in influencing their practice, long-term (Gregoire, 2003). Therefore, if designers of professional development are interested in affecting teachers’ educational practice and the choices that are made in the classroom, they must address the practicing teachers’ currently held educational beliefs.

In an attempt to change teachers’ beliefs, Dr. John Schell takes a group of educators to Salem and Gloucester, Massachusetts every summer on an eight day excursion in which those teachers become learners in a graduate level course on situated and contextual learning theories and associated instructional methods. However, the experience is much more than a typical college course. In this course, educators learn about the theoretical and practical applications of the situated perspective. But perhaps

more importantly, in order to illustrate the potential of these educational theories and methods, Dr. Shell has designed this course to be situated within a powerful context of its own – the context of whales and their environment. The result is what has become known in the College of Education as the "Whale Class."

During the Whale Class, educators participate in class sessions on the various educational theory topics mentioned above. Then after each class session, educators head for the high seas to participate as learners on a commercial whale watching expedition. At the beginning of the week their level of participation on the boat is just like that of average whale watchers on their first trip learning from the on-board naturalist and educational interns. Throughout the week, the class members progress in their level of participation to the point of becoming on-board educators themselves, helping other passengers understand what they are experiencing while out on the ocean by implementing the strategies they have learned in the class. While all of this is happening, a dynamic learning community develops. In this community the learners are educators themselves – educators who are challenged to examine how their own personal learning experience influences their beliefs about their students' learning.

Design of the Whale Class

The specific context of whales and their environment is central to the design of the Whale Class. We are all citizens of the planet Earth and environmental issues that affect the natural world, affect us all. Therefore, there is inherent relevance for all learners associated with topics that focus on environmental issues. One of the goals of the Whale Class is to encourage environmental stewardship among educators and to help them use contextual teaching and learning practices to incorporate environmental

education into their curriculum. Also, because the environment is a complex system of the natural world and the societies that inhabit it, it provides a rich interdisciplinary context for embedding any curriculum topic including science, social studies, mathematics, and language arts. Not to mention the non-core subjects of fine arts, health and physical education, and career and technical education. As such, the environment of whales serves as an ideal example for modeling the use of context in educational practice. Furthermore, having teachers investigate unique environmental issues within the context of professional learning puts them in the position of learners of new subject area content as well as educational theory and methods, providing an opportunity for them to examine the situatedness of their own learning and how their personal learning experience influences their beliefs about teaching and learning.

Study Design

As mentioned above, Dr. Schell has designed the Whale Class to be a situated learning experience for teachers. Putnam and Borko (2000) have discussed the values of situating professional development experiences for teachers outside of regular classroom settings and in more authentic contexts as a way to encourage teachers to "learn and change in powerful ways" (p.6). The current study investigates the Whale Class, which has arguably encouraged many of its past participants, to learn and change their educational beliefs in powerful ways. The question is whether the change was an unanticipated byproduct for those particular learners, or if the transformative power and potential exists for other course participants.

One particular theory that supports the investigation of such a question is conceptual change theory. A number of researchers (Pintrich, Marx, & Boyle,1993;

Posner, Strike, Hewson, & Gertzog, 1982; Chinn and Brewer, 1993 & 1998; Davis, 2001) have added to the knowledge base in this area. Additionally, the theory of transformational learning (Mezirow, 1991) can also be used as a lens for investigation of the phenomenon of teacher belief change. Furthermore, the specific type of beliefs that the Whale Class is meant to influence and with which this study is most concerned are epistemological beliefs. In Chapter II, I will fully discuss the theories of conceptual change and transformational learning and how these theories relate to an investigation of the change of teachers' epistemological beliefs.

Statement of the Problem

In past years of the Whale Class, teachers have created lessons that demonstrated their abilities to design products that utilize the particular theories and methods that are taught in the class. The professor also has anecdotal evidence from students who have stayed in touch that they have continued to use what they learned in their practice. However, no formal research had been conducted in the past to determine the specific influence of the Whale Class on teachers' epistemological beliefs. It was assumed that if teachers continued to implement the theories and methods that they learned during the class, that there had been some sort of change in beliefs in order to support their practice, but that had not been investigated up to this point. Further, there had been no documentation of the conceptual change process of teachers during the Whale Class or a systematic investigation into the transformative nature of the class.

Purpose of the Study

Given the assumptions that educational beliefs are an important factor in teachers' practice and that the Whale Class has the potential to augment and even transform

teachers' beliefs, it was my goal in this study to determine if the Whale Class does facilitate a change in teacher beliefs and to document that change as it happened. Through this investigation, it was my goal to contribute to the body of knowledge that exists on the epistemological belief change process of teachers in situated professional development settings.

Research Questions

Given that my purpose was to determine if the Whale Class facilitates a change in teacher beliefs and to document that change as it happens, the specific questions that were addressed were:

- What were teachers' epistemological beliefs prior to participation in the Whale Class?
- What was the nature of the course that was the context for any change in educators' beliefs?
- What were the epistemological beliefs of teachers after participation in the Whale Class?
- What elements of the context could be attributed to any belief change that the teachers experienced?

Overview of the Methodology

I used a multiple case study design accompanied by participant observation and document analysis methods in order to investigate the research questions stated above. Before the start of the Whale Class in the summer of 2006, I sent a survey to all teachers who had signed up for the class in order to determine their general beliefs about teaching and learning. Based on the information gathered from the survey, I identified four

teachers who were the focus of in-depth case studies. I conducted semi-structured interviews with each of the identified participants prior to the start of the Whale Class in order to more thoroughly investigate their existing educational beliefs and concepts of teaching and learning that are related to those espoused by in the curriculum of the Whale Class. During the week of the class, I was a participant observer in the course. It was my aim to gain a full understanding of the nature of the learning context and to identify elements of the context that could have an influence on educational beliefs of teachers involved in the class. After the class ended, I conducted another round of semi-structured interviews to determine whether or not the class had any influence on the teachers' educational beliefs. In conjunction with this, I analyzed both the lessons and final reflections that the teachers created for course assignments for evidence of the teachers' understanding of the theories promoted by the class. Finally, I analyzed the findings from the pre and post course interviews in conjunction with the findings from the participant observation in order to create narratives that represent any conceptual change and transformation that was experienced by each of the participants.

Chapter Summary

In this chapter I have presented an overview and introduction to the context, design, and purpose of this study. In the chapters that follow, I will more completely describe these elements. In Chapter II, I will summarize the literature that has informed me in the design of this study including conceptual change theory, transformational learning theory, epistemological belief change, and the various educational theories that form the curriculum of the Whale Class. Then in Chapter III, I will present the fully

designed research plan. Chapters IV and V are the findings and analysis. Finally, Chapter VI is a conclusion detailing specific recommendations for future research and practice.

CHAPTER II

REVIEW OF THE LITERATURE

Introduction

In this chapter I will review the literature that informed the design and interpretation of this study. Since the goal of this study was to investigate the influence of the Whale Class on teachers' epistemological beliefs, there are two main areas of the relevant literature. The first area is related to the process of belief change, since that was the phenomenon under investigation. In particular, conceptual change (Chinn & Brewer, 1993 & 1998; Posner, et al., 1983; Pintrich, Marx, & Boyle, 1993; Davis, 2001) and transformational learning (Mezirow, 1991) are the theories that are related to belief change that were considered in the design and analysis of this study. The second area of the literature is the specific type of epistemological belief that is advocated by the Whale Class – the situated perspective. So in the second section of this chapter, I discuss the literature on the broad topic of epistemological belief development and then focus specifically on a discussion of the epistemology of the situated perspective.

Area One – Changing Beliefs

Given my initial interest in teachers' epistemological beliefs, I turned to the literature on the theories have been proposed as an explanation for the process of changing one's beliefs. This led me to the theories of conceptual change and transformational learning. In this section I will discuss each of these two theories that

served as a lens for my investigation into the change process that I witnessed in educators involved in the Whale Class.

Conceptual Change

Conceptual change can be broadly defined as learning that facilitates the change of an existing concept or idea. In this particular study, the "concept" under investigation was educators' concepts, or more specifically, their beliefs about the nature of knowledge and how knowledge is developed. While this study focused specifically on beliefs, which are often more emotional and less logical than many have defined concepts, there is a large part of the conceptual change literature that addresses the fact that concepts are not always based on factual information, and further, there is a suggested relationship between the affective domain and the conceptual change process (Pintrich, Marx, & Boyle, 1993; Chinn & Samarapungavan, 2001; Hofer & Pintrich, 1997). There are multiple versions of conceptual change theory, and below I summarize and synthesize the main works that have informed my understanding of conceptual change.

Pintrich, Marx, and Boyle (1993) provided a comprehensive summary of conceptual change research and pointed toward Piaget as the originator of the notion of conceptual change with his thoughts of disequilibrium and accommodation. They summarize Posner, et al., (1982) and the four conditions that must exist for a learner to make accommodations in their existing concepts for new information and ideas. Those four conditions are that 1) the learner must be *dissatisfied* with their existing concept; 2) the new concept must be *intelligible*; 3) the new concept must be *plausible*; and, 4) the new concept must seem *fruitful*. Notice two of the conditions of this model appeal to the logical constructs of intelligibility and plausibility. However, the classification of

concepts as being satisfactory or fruitful appeals to the affective domain. So even in this early model of conceptual change, there was some consideration of more subjective issues.

Chinn and Brewer (1993, 1998) created a taxonomy of the conceptual change process. Their original work in 1993 in which they studied students' responses to anomalous data, led to the original taxonomy. At that time they proposed seven categories of responses that learners exhibit when presented with anomalous data. Those categories of responses are to:

a. ignore the data
b. reject the data
c. exclude the data
d. hold the data in abeyance
e. reinterpret the data
f. accept the data and make peripheral theory changes
g. accept the data and change theories

Upon further studies in 1998, they determined that there is an eighth category of response that was not found in the original studies. That category of response is to *profess uncertainty about the validity of the data.* This eighth response category falls between categories *b* and *c* above. While this taxonomy provides a continuum of responses that might be observed in the conceptual change process, it does not suggest reasons why a learner might respond to a new concept in any of the particular ways. However, when Chinn and Brewer's taxonomy is combined with Posner, et al.'s conditions, the result is a much more productive framework for investigation of the conceptual change process.

The result of the combination is represented below an analysis checklist that allows an investigator to look for the logical stages of conceptual change while still considering elements of the affective domain.

Table 1

Conceptual Change Observation Tool

Observed Category of Conceptual Change	Conditions for Conceptual Change
a. ignore the data b. reject the data c. profess uncertainty about the validity of the data d. exclude the data e. hold the data in abeyance f. reinterpret the data g. accept the data and make peripheral theory changes h. accept the data and change theories	❑ The learner was *dissatisfied* with their existing concept ❑ The learner felt the new concept was *intelligible* ❑ The learner felt the new concept must be *plausible* ❑ The learner felt the new concept was *fruitful*

However, even if we view the model proposed by Posner, et al., to be inclusive of the affective domain, and we overlap their conditions with Chinn and Brewer's taxonomy, Pintrich, Marx, and Boyle (1993) still argue that these models are "cold," rational models that do not allow for the consideration of the role played by motivation and context in the conceptual change process. They discuss the role of beliefs of all sorts, including epistemological beliefs, on the conceptual change process. They go on to say that as long as learning is situated within the design of traditional classrooms and schools, and not authentic environments in which concepts can be applied and utilized, conceptual change is very unlikely. The importance of context is discussed more thoroughly below in the section on contextual teaching and learning (Schell, 2001) which is a major theory used to develop the curriculum and experience of the Whale Class.

While the works above focus on conceptual change of grade-school students within specific disciplines, Davis (2001) argues that conceptual change is relevant when studying the professional development of teachers. She argues that conceptual change could be considered in any discipline and at any level. Further, in order to facilitate conceptual change, an educator should employ the specific instructional model that she outlines. The elements of the conceptual change instructional model are:

1. Reveal student preconceptions
2. Discuss and evaluate preconceptions
3. Create conceptual conflict with those preconceptions
4. Encourage and guide conceptual restructuring.

Though it was not the purpose of the current study to make recommendations for designing instruction to teach for conceptual change, I was mindful of features of the course design that happened to exhibit characteristics of any of the elements of such an instructional model. With this in mind, the observation tool expands to include one more column in Table 2 below.

My goal in using conceptual change theory in the context of the current study is to use this theory as a lens for examining change in the epistemological beliefs of teachers. While much has been written on conceptual change (Chinn & Brewer, 1993 & 1998; Posner, et al., 1983; Pintrich, Marx, & Boyle, 1993; Davis, 2001), and much has been written on epistemological beliefs and belief change (see below), the literature that specifically addresses the relation of epistemological beliefs to conceptual change (Qian & Alvermann, 1995) investigates only the influence of epistemological beliefs on learning, not on teaching. Teaching beliefs are the focus of this study. Further, the

Table 2

Conceptual Change Observation Tool – *Expanded*

Observed Category of Conceptual Change	Observed Conditions for Conceptual Change	Observed Elements of the Conceptual Change Instructional Model
a. ignore the data b. reject the data c. profess uncertainty about the validity of the data d. exclude the data e. hold the data in abeyance f. reinterpret the data g. accept the data and make peripheral theory changes h. accept the data and change theories	❑ The learner was *dissatisfied* with their existing concept ❑ The learner felt the new concept was *intelligible* ❑ The learner felt the new concept must be *plausible* ❑ The learner felt the new concept was *fruitful*	❑ Reveal student preconceptions ❑ Discuss and evaluate preconceptions ❑ Create conceptual conflict with those preconceptions ❑ Encourage and guide conceptual restructuring.

literature discussed above focuses on conceptual change in relation to subject specific concepts, rather than epistemological concepts. Therefore, the specific gap in the literature related to conceptual change, is to investigate the theory's application to development of epistemological concepts and beliefs. However, there is an area of the literature in the field of Adult Education that has addressed the issue of belief change, and that is transformational learning. In this next section, I will discuss the theory of transformational learning, and will then present the final complied theoretical framework that I have created as a lens for the current study.

Transformational Learning Theory

Another theory that is relevant to the investigation of teacher belief change is transformational learning theory. Transformational learning is an adult learning theory that is used as a lens to investigate certain transformations adults experience when a

change in perspective is taking or has taken place (Mezirow, 1991). Through the lens of transformational learning theory, professional development must encourage a transformation in epistemological beliefs.

There are ten phases of transformational learning theory (or "transformative" as it is used interchangeably in the literature.) Those original ten phases reported by Mezirow are:

1. A disorienting dilemma
2. Self-examination with feelings of guilt or shame
3. A critical assessment of epistemic, sociocultural, or psychic assumptions
4. Recognition that one's discontent and the process of transformation are shared and that others have negotiated a similar change
5. Exploration of options for new roles, relationships, and actions
6. Planning of a course of action
7. Acquisition of knowledge and skills for implementing one's plans
8. Provisional trying of new roles
9. Building of competence and self-confidence in new roles and relationships
10. A reintegration into one's life on the basis of conditions dictated by one's new perspective (Mezirow, 1991, p. 168-69).

In Taylor's (1997) and Wilson and Kiley's (2002) reviews of the literature on transformational learning, they point out that the studies that they reviewed confirm to some degree what Mezirow has been arguing about transformative learning – the revision of meaning structures seems to be initiated by a disorienting dilemma followed by a series of learning strategies involving critical reflection, exploration of different roles and

options, and negotiation and renegotiation of relationships. But they both also argue that the ideal practice for fostering transformative learning is theoretically based, with little support from empirical research.

King (1999, 2002, & 2004) has written extensively on the topic of transformational learning. In 1999, she studied Adult Basic Education teachers who were in a professional development class learning to use technology in their teaching practices. She used a mixed methods study beginning with the Learning Activities Survey (LAS) which helped the researcher to determine if there had, indeed, been a transformation on the part of the learner. Once a transformation had been determined, she then conducted follow-up interviews and document analysis of the journal entries to further explore the nature or the educators' transformations. Then in 2002, she conducted another study with K-12 teachers who were also in a professional development class learning to use technology in their teaching practices. Again she used the LAS, follow-up interviews, and document analysis for data collection. In both of these studies she found that a majority of educators in the situation had experienced a perspective transformation, and that critical reflection was central to their transformation process. Finally, in 2004 she studied the transformational effects of an introduction to adult education class on the beliefs of adult educators. In this study, King addresses the issues that educators who are encouraging a transformation face and the responsibilities that they have. So we see that King has investigated the stages of transformational learning in multiple studies in which she investigates the teachers' pedagogical beliefs, or beliefs about the process of teaching. This is encouraging when considering transformational learning as a possible lens for investigating changes in teachers' epistemological beliefs.

Though all of King's studies are informative and help to validate the components of transformative learning theory, and offer support for the idea of using transformational learning as a lens to investigate teacher's epistemological belied change, they mimic the situation that Taylor (1997) and Wilson and Kiley (2002) describe as cited above. That situation being that there is little empirical research that challenges or further develops the theory. It only uses the theory to investigate a situation. Therefore, I have combined my understandings of conceptual change theory with transformational learning theory to create a modified framework for the investigation of epistemological belief change in teachers participating in the Whale Class.

A Framework for Investigation of Epistemological Belief Change

As I will discuss below in the summary of the literature related to the curriculum of the Whale Class, the class employs theory and methods that have been shown in the literature to be productive in facilitating epistemological change. Therefore, it was assumed that teachers involved in the class would experience such a change. However, a formal investigation into the phenomenon of change had never been conducted on the class before this study. Therefore, the goal of this study – to investigate the influence of the Whale Class on teachers' epistemological beliefs – was both needed and appropriate. In order to do this, I used a combination of conceptual change theory and transformational learning theory as a framework for investigation.

In employing this framework, I looked for evidence of Posner, et al.'s (1982) conditions of conceptual change and elements of Davis' (2001) conceptual change instruction within the activities of the class. Among the participants, I watched for Chinn and Brewer's (1998) categories of conceptual change. In conjunction with the various

elements and conditions of conceptual change theory, I also looked for evidence of the stages of transformational learning during the conceptual change process among the study participants. The use of transformational learning theory is important because it is much more inclusive of the affective domain that Pintrich, Marx, and Boyle (1993) insist is central to the theory of conceptual change.

Below is a table that represents what I originally perceived to be an overlap of the two theories. The stages of transformational learning have been removed from the original order in which Mezirow proposed them, but as he points out in his writings (1991), the stages of transformational learning are rarely linear in their occurrence, and certain stages of transformation may be experienced multiple times within the transformation process.

By combining these two theories, I combined two areas of the literature that, until now, have remained fairly isolated in the literature. This new model served as a framework for the design of the current study, and was be a lens for analysis and interpretation of the data after it was collected.

Area Two – Epistemology of the Situated Perspective

Epistemology is the philosophical study of the nature of knowledge and the process of knowing (Hofer, 2001). But lately, this philosophical inquiry has become the subject of psychological investigation (Perry, 1970; Belenky, et al,, 1986; Hofer & Pintrich, 1997; Qian & Alvermann, 2000). In this section I discuss the literature that has focused on epistemology as it relates to teaching and learning, and then focus on the specific epistemological views of the situated perspective.

Table 3

Conceptual Transformation

Observed Category of Conceptual Change	Conditions for Conceptual Change with corresponding Stages of Transformational Learning		Observed Elements of the Conceptual Change Instructional Model
a. ignore the data b. reject the data c. profess uncertainty about the validity of the data d. exclude the data e. hold the data in abeyance f. reinterpret the data g. accept the data and make peripheral theory changes h. accept the data and change theories	❑ The learner was *dissatisfied* with their existing concept	• A disorienting dilemma • Recognition that one's discontent and the process of transformation are shared and that others have negotiated a similar change • Exploration of options for now roles, relationships, and actions	❑ Reveal student preconceptions ❑ Discuss and evaluate preconceptions ❑ Create conceptual conflict with those preconceptions ❑ Encourage and guide conceptual restructuring.
	❑ The learner felt the new concept was *intelligible*	• Self-examination with feelings of guilt or shame • Acquisition of knowledge and skills for implementing one's plans	
	❑ The learner felt the new concept must be *plausible*	• A critical assessment of epistemic, sociocultural, or psychic assumptions • Planning of a course of action • Provisional trying of new roles	
	❑ The learner felt the new concept was *fruitful*	• Building of competence and self-confidence in new roles and relationships • A reintegration into one's life on the basis of conditions dictated by one's new perspective.	

Epistemological Change

Perry (1970) was one of the first researchers to investigate the nature of epistemological development with his study of college students which resulted in a leveled view of personal epistemology. The resulting model from Perry's longitudinal studies includes nine epistemological positions at which a student might find him or herself, and as Hofer and Pintrich (1997) point out, these positions are similar to Piaget's developmental schemes. In fact, Hofer and Pintrich go on to compare Perry's model with Belenky et al's (1987) epistemological perspectives in "women's ways of knowing," Baxter Magolda's (1985, 1992) ways of knowing in epistemological reflection, King and Kitchener's (1994) reflective judgment stages, and Kuhn's (1991) epistemological views in argumentative reasoning. In these models of epistemological development, the epistemologies range from "absolute truth" views of knowledge at the earliest stages of development to "relative/contextual views of knowledge" in the later stages.

Another developmental view of epistemological beliefs that Hofer and Pintrich (1997) could add to their comparison above is the model proposed by Qian and Alvermann (1995). They have conducted research into the specific relationship of students' epistemological beliefs and conceptual change in science. They found that students who had a "simple-certain" view of scientific knowledge were less likely to experience conceptual change. This simple-certain view of knowledge is in comparison in their model to "complex and tentative." In this study, they investigate the influence of existing epistemological beliefs on new learning, but it does not investigate the phenomenon of the development of epistemological beliefs or recommend strategies to

encourage epistemological belief change. It simply acknowledges that existing beliefs have an influence on learning.

While Qian and Alvermann do not specifically recommend strategies to facilitate epistemological development, many researchers (King & Kitchener, 1994; Schön, 1983; Bushnell & Henry, 2003) have emphasized the importance of reflection in the process of epistemological change. Schön's (1983) model of reflective practice advocates three forms of reflection that must be employed to facilitate change in practice. Those three forms are reflection-in-action, reflection-on-action, and reflection-for-action. In fact, the work of both Schön and King and Kitchener are taught in the curriculum of the Whale Class. Reflection techniques are employed after every day of situated experience during the week of class in hopes of helping class participants incorporate what they have learned during the class into their own practice.

Finally, Brownlee, Purdie, & Boulton-Lewis (2001) have discussed the direct impact that teachers' own epistemological beliefs have on the types of learning opportunities that they design for their own students. They designed a specific intervention to address pre-service teachers' epistemological beliefs. Elements of the intervention include: situating student learning experiences, an atmosphere of mutual respect, and regular opportunities for reflection. The result of this intervention is that students did "become more meta-cognitive" (p.263) and the authors argue that this happened as a result of having the students reflect on epistemological beliefs.

In summary, it seems that most educational researchers with an interest in epistemology recognize that there are levels of epistemological beliefs, and these beliefs have a significant influence on learning. I would argue that for a teacher, these personal

epistemological beliefs are of utmost importance since the beliefs of the teacher influence the design of any lesson or learning activity that is implemented. Therefore, it is important that teacher educators and professional developers encourage epistemological development and design learning activities of their own that model the application of a "relative/contextual" epistemology. Employing the situated perspective is one way to achieve that objective.

The Situated Perspective

The situated perspective, as presented in the context of the Whale Class, is really a blend of several epistemological perspectives that would fall toward the relative/contextual end of the developmental views of epistemological beliefs discussed above. The most extreme version of situatedness represents an epistemological shift in the understanding of the nature of knowledge completely away from the cognitive psychology perspective and views knowledge as a socially negotiated entity generated by and belonging to the social setting from whence it comes, rather than any individual member of the community (Lave, 1988). Other theories that are related, but perhaps not as extreme, include Communities of Practice (Wenger, 1998), situated cognition and cognitive apprenticeships (Brown, Collins, & Duguid, 1989; Collins, Brown, & Newman, 1989), and Contextual Teaching and Learning (Schell, 2001; Sears, 2002). Each of these representations of the situative perspective is discussed below.

Jean Lave has been one of the most prolific writers in this area and first began the dialogue that evolved into situated learning theory with her anthropological investigations into the "informal" learning that occurs in apprenticeships. In 1982, she published an article in *Anthropology & Education Quarterly* in which she challenged anthropologists

lack of involvement in the development of ideas about learning with the statement that, "anthropology has not seriously tackled questions of learning, although we have, through our focus on cultural transmission and on ethnography of schools, spent a good deal of effort investigating teaching." It was in this article that we first saw her specific interest in further developing a social practice theory of learning.

In 1988, Lave published *Cognition in Practice: Mind, mathematics, and everyday practice,* in which she shared findings from the Adult Math Project and argued the contradictions between the psychological and anthropological approaches to understanding how people learn. She argued that psychological tradition is too engrained in the laboratory and the individual mind, while an anthropological/social perspective offers a much richer and more descriptive understanding of the social processes involved in knowledge development. This was a major shift away from the position taken by cognitive psychologists of the time who asserted that learning was about individual accumulation of knowledge (Anderson et al., 1997). She also issues a challenge to the long promoted psychological construct of learning transfer. This challenge and subsequent debate on the topic of learning transfer has been a central issue in the development of this theoretical perspective of learning.

A number of Lave's publications focus on her reports of apprenticeship learning, but in her 1991 publication with Wenger they fully articulated the theory of Legitimate Peripheral Participation (LPP). In this theory, Lave and Wenger argue that all learning is an inevitable product of participation in larger communities of practice. And while the official name LPP has fallen by the wayside in subsequent publications on the topic, the ideas are still embedded within the language of the situative perspective. In LPP theory,

"new-comers" to a community first participate on the periphery of the central activity of the community. However, this does not imply that peripheral participation is any less significant to the community or to the learning than is full participation. Full participation is the level of participation in the community demonstrated by the "old-timers" in the community. Whether the level of participation is peripheral, full, or anywhere in between, the learning that is associated with each level of participation is tied to the community and the socially defined goals and purposes of the community.

Wenger (1998) further developed the notion of communities of practice into a specific model for implementing such communities. Wenger suggests that there are four intermingling aspects of Communities of Practice, all of which interact in the process of learning. Those four components are: community – learning as belonging; identity – learning as becoming; meaning – learning as experience; and practice – learning as doing. In addition to these four components, Wenger helps make distinctions in the language used when discussing these ideas by focusing on "knowing" rather than learning. The use of "knowing" implies more active participation by the individual in constructing meaning rather than "learning" which can be interpreted as more passive reception of empirical truths. We also see that there is a shift away from the purely anthropological perspective in which the knowledge is an attribute of the community and more toward the cognitive psychological perspective. In Communities of Practice, knowledge development is a socially situated activity and the knowledge that can be generated is made possible within the dynamics of the community. However, the knowledge belongs to individuals within the community.

Brown, Collins, & Duguid (1989) and Collins, Brown, & Newman (1989) took a slightly different approach from Communities of Practice in applying the situated perspective in the development of the ideas of cognitive apprenticeships. Cognitive apprenticeships build on Lave's (1988) work with traditional apprenticeships and transforms them into a framework for a specific model of instruction. In this particular model there are six specific instructional methods that are employed to foster the apprenticeship of learners. Those methods are: 1) Modeling, 2) Coaching, 3) Scaffolding, 4) Articulation, 5) Reflection, and 6) Exploration. These methods provide specific guidance for teachers hoping to embrace the situated perspective and employ it in their educational practice. And similar to communities of practice, the idea of cognitive apprenticeships is an attempt to align a social view of learning with the traditions of cognitive psychology by situating the discussion of individual learning within a social framework for instruction.

Greeno (1989, 1997, 1998) has been another voice that has added to the understanding of this social perspective on learning – to which he refers as a theory of thinking, rather than a theory of learning. Greeno was trained as a psychologist, and like Brown, Collins, Duguid, and Newman he brings the cognitive psychology perspective to the discussion. In his 1989 article, he suggests that although psychological research has made great progress in the area of specific task performance, little headway has been made by the field in the understanding of general thinking abilities such as higher order thinking, critical thinking, creative thinking, and otherwise "productive thinking" abilities. In order to better understand the productive thinking processes, he suggests investigation from a situated cognition perspective. He supports this argument saying

that, “Thinking is situated in physical and social contexts. Cognition, including thinking, knowing and learning, can be considered as a relation involving an agent in a situation, rather than as an activity in an individual’s mind” (p. 135).

Another take on the situated perspective is contextual teaching and learning. Contextual Teaching and Learning (CTL) is a framework for teacher education which was the focus of much research funded by the U. S. Department of Education. Researchers at Ohio State University made many contributions to this topic, including numerous technical reports on CTL (Sears, 2001). The U. S. Department of Education also funded the University of Georgia as another location that did extensive work on the topic. The Whale Class is one of the many courses at the University of Georgia that were designed with the CTL framework in mind.

According to Sears (2002), a researcher that led the Ohio State University efforts on the topic, CTL is very simply a concept that helps teachers relate subject matter to real-world situations. She goes on to say that CTL “provides a conceptual framework for unifying a constellation of education theories and practices and represents one approach to improving teacher education. (p.2)” Though there are many who have done research on CTL and have created their own various definitions, Lynch and Harnish (2003) who conducted the evaluations on the CTL project at UGA, claim that the “common denominator of the varied research on CTL-related areas is that education should build on experience and contexts…that are familiar to learners. (p. 7)”

Schell (2001), who chaired the theoretical framework committee of the CTL group at UGA, suggests that there is a continuum of contexts which may be employed when using context for teaching and learning which range from abstract to authentic.

Further, he goes on to arrange this continuum within the construct of various epistemological perspectives that would be prominent at various points along the continuum, with situated cognition on the far end of the continuum. The Whale Class would fall at the far end of that continuum. Below is a reproduction of Schell's model that depicts this idea.

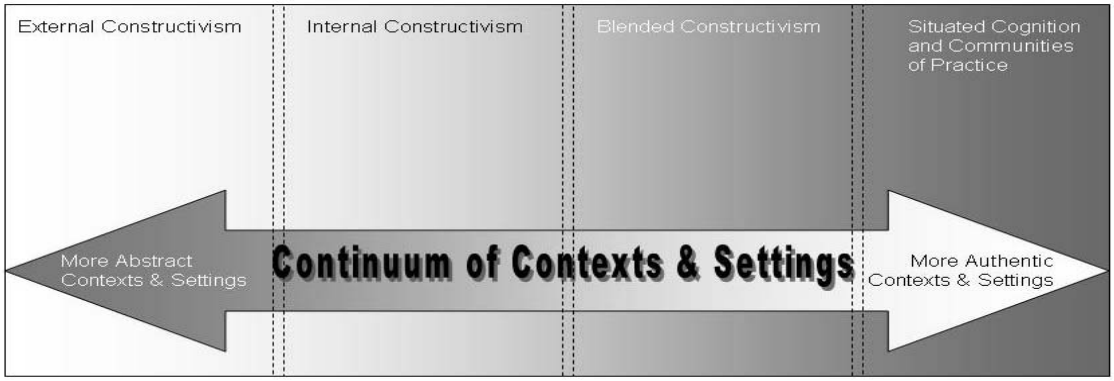

Figure 1

Continuum of Contexts & Settings (Schell, 2001)

External constructivism represents the passive role of the learner in which information is presented by the teacher or instructor and received by the learner. Learners are then expected to incorporate that information into their existing ideas and mental models for future use. External constructivism overlaps with developmental views of epistemology on the "absolute view of knowledge" end of the epistemology continuum. At the opposite end of the continuum we see communities of practice and situated cognition, in which participants in the community are actively engaged in the process by constructing knowledge, rather than accepting information. Knowledge development at this end of the continuum is a process of socially negotiating existing ideas and concepts with new information. As mentioned at the beginning of this section, the situated

perspective would overlap with the “relative/contextual” end of the developmental epistemology models.

As I stated at the beginning of this section, what results from all of these interpretations and applications of the situated perspective is an epistemological shift in thinking from a purely individualistic view of learning and knowledge to a much more socially constructed view. In the design of this study, I was looking for any movement along the continuum of epistemological beliefs away from absolute/objectivist views of knowledge toward the situated/contextual view of knowledge.

Chapter Summary

In this chapter I have discussed conceptual change theory and transformational learning which are areas of the literature that describe the process that I hoped to observe in teachers in this study. Using conceptual change theory and transformational learning theory, I created a framework for investigation in this study. I also summarized the literature on epistemological change and the situated perspective, which serves as the foundation of the Whale Class and is the specific epistemological perspective that teachers are encouraged to adopt as a result of the class. In the next chapter I present the full design of the study that helped me to determine what influence the Whale Class had on educators’ epistemological beliefs.

CHAPTER III

METHODOLOGY

Based on the literature, I have concluded that epistemological beliefs are an important factor in teachers' practice and that the Whale Class has the potential to augment and even transform educators' beliefs. As such, it was the goal of this study to determine if the Whale Class does facilitate a change in educators' beliefs and to document that change as it happened. Through this investigation, it was my goal to contribute to the body of knowledge that exists on the epistemological belief change process of educators in situated professional development settings.

Given that purpose, the specific questions that were addressed include:

1. What are the educator's epistemological beliefs before the class?
2. What is the nature of the class that is the setting for any change in the educator's beliefs?
3. What are the educator's epistemological beliefs after the class?
4. What elements of the class can be attributed to any change in the educator's epistemological beliefs?

Research Design

For this study, I implemented a multiple case study design. Case studies were important because of my interest in the educational beliefs of individuals participating in

the course. In order to fully understand the conceptual change process of an individual, an in-depth investigation into the experience had by that individual was necessary. Further, in order to draw any meaningful conclusions, it was important to have investigated multiple cases in order to discover similarities between cases. Specific methods that I used within the case studies include survey, semi-structured interviews, participant observation, and document analysis.

Possible Paradigms

According to Patton (2002), "A paradigm is a worldview – a way of thinking about and making sense of the complexities of the real world" (p. 69). There are several possible paradigms including objectivism, constructivism, and subjectivism (Crotty, 1998). Further, there are multiple methodological strategies that might be employed within and among each of those paradigms. The question however, is which paradigm and methodological strategies are the most appropriate combination for investigating the questions of this particular study.

Paradigms are also referred to as metaphysics or belief structures (Denzin & Lincoln, 1994). As I have discussed in the previous chapter, belief structures of teachers are important to their practice. Similarly a researcher's belief structure must be identified in order to clearly articulate the position from which she is collecting and interpreting her data. The four main paradigms of inquiry according to Guba and Lincoln (1994) are the positivist, post-positivist, critical theory (including sub strands such as neo-Marxism, feminism, materialism, and participatory inquiry), and constructivism. Crotty (1998) on the other hand, suggests three different paradigms which are further categorized into

various theoretical perspectives. The possible paradigms according to Crotty are objectivism, constructivism, and subjectivism.

Guba and Lincoln's (1994) positivism and post-positivism would be theoretical perspectives that fall within an objectivist paradigm. The objectivist paradigm views the world in terms of an objective reality that exists and is something that can be plainly understood regardless of personal or social influence and bias. The goal of inquiry in this paradigm is to explain reality and predict and control what does or doesn't happen within that reality (Guba & Lincoln, 1994). An objectivist investigation in the context of the Whale Class might look for evidence that teachers have learned specific theories. Further, such a researcher might then scrutinize teacher practice and student learning for evidence of the existence or absence of the pre-determined theories in the teacher's practice. While this sort of inquiry might be appropriate for evaluating the whale class as a form of professional development, the goal of the current study is not an evaluation study.

The multiple forms of the critical theory paradigm also believe in a reality, but that reality is a product of social, political, cultural, economic, ethnic, and gender values that have crystallized over time (Guba & Lincoln, 1994). This type of theoretical perspective would fall within what Crotty (1998) would call a subjectivist paradigm. The goal of inquiry from this perspective is to expose the subjective values that have led to the creation of realities that are engrained in such subjective truths rather than an objective, value-free truth. Given the theme of environmental education that is so prevalent in the whale class, a subjectivist approach could be productive. The whaling industry in which whales are hunted and killed for their blubber is no longer practiced in the Americas. However, it is still a thriving practice in some countries, and some

naturalists believe that this practice is leading to declining whale populations. A subjectivist researcher would be interested in the reasons why certain cultures view the practice of whaling as an acceptable, unquestioned practice and others do not. Further, what are the social, political, cultural, ethnic, economic, or gender values that have helped to create such different realities in the two locations?

The paradigm from which I will investigate the identified research questions is a constructivist paradigm. In a constructivist paradigm the goal of research is to understand the nature of a situation by understanding both object and subject interacting within a situation. Since the goal of this study is to understand the conceptual change process (object) of teachers (subject) within the context of the Whale Class (situation), a constructivist interpretation of the situation is fitting.

Research Setting

As described in Chapter 1, the context for this study was the "Whale Class." More officially, the name of this course is "Situated Cognition and Implications for Teaching." It is a course that was first designed as a traditional graduate level course offered on the campus of a major research university in the southeastern United States. In the summer of 1996, the professor of the course experienced the power of situated cognition while he was on vacation and happened to take a day trip on a commercial whale watch. While on the boat, he met one of the on-board naturalists for the non-profit whale conservation organization that provides educational services on the boat. Through conversation, the two discovered they shared a passion for helping others learn and were excited about the possibility of combining the experience of whale watching with a course on educational theory. So the professor worked with the naturalist to re-design the existing course so that

others could experience the power of situated cognition for themselves. What was created is a contextual, situated learning experience for teachers in which they are studying situated learning theory and the situated perspective and its implementation in educational practice.

The students in the course are housed at a regional college in Salem, Massachusetts. This college is the location of the class sessions in which all of the teachers participate. Each morning of the course, the class members gather with the course instructors to explore a specific instructional method and theoretical perspective that fits within the framework of the course. During this class session, teachers also participate in example lessons that employ the methods discussed. After the morning class session, teachers travel to Gloucester, Massachusetts to travel with a commercial whale watching company that employs a naturalist and educational interns who provide on-board education about the whales and the environmental and marine issues the whales face. From the perspective of the learning theory that was discussed in that morning's class, teachers look for evidence of that theory in practice among the educators (naturalist and interns) and learners (passengers) on the boat as they engage in and learn to lead educational activities. Then at the end of the day after the boat returns to the dock, teachers reflect on the day with the course instructors and discuss possibilities for implementing the theory in their own practice.

An example of a typical day during the workshop might look something like this. During the first class session, teachers discuss situated learning theory (Lave & Wenger, 1988; Wenger, 1998; Brown, Collins & Duguid, 1989) and how that theory might be implemented in different educational settings with related instructional models such as

Cognitive Apprenticeships (Collins, Brown, & Newman, 1989). Then on the boat, teachers would observe how the interns are behaving as cognitive apprentices to the on board naturalist, learning about the identification and tracking of whales and passenger education. That evening, a time of reflection is used to help teachers identify the elements of cognitive apprenticeship that were present and what they might recommend to create a more comprehensive cognitive apprenticeship experience for themselves and the interns. As the workshop progresses, teachers move into the role of cognitive apprentices themselves and begin to participate in on-board education for the passengers and reinforce their learning about the whales and the environment.

Using what is learned about theory and instructional methods through class activities, example lessons, and daily reflection, teachers develop lessons that exhibit CTL practices for their own classrooms. At the end of the workshop, teachers make presentations of the lessons they have designed and share feedback and suggestions for the improvement of each teacher's lesson. Finally, teachers have approximately one month to finalize lesson plans and course reflection assignments to submit to the professor via the on-line course portal that is used throughout the course.

Participants

Participants in this study were students in the summer 2006 session of EOCS 8040: Situated Cognition and Implications for Teaching. The course was designed to be of value to pre-service teachers, K-12 classroom teachers, adult educators, and educational researchers from various fields represented in the college. Historically, students from multiple disciplines across the college have been participants in this class since its maiden trip in 1997. For the purpose of the research design, I targeted K-12

classroom teachers as participants in the in-depth case-study component of the design. Based on the 2006 class participants and willingness to participate as case-study participants, the resulting four participants were:

- Allen – a current high school engineering and business education teacher pursuing a Specialist Degree in Workforce Education.
- Anne – a retired home economics teacher pursuing a Specialist Degree in Workforce Education.
- Adrian – a teacher of 13 years who decided to leave the classroom at the end of the school year just before the summer 2006 class began. She has a Masters degree in Instructional Technology and enrolled as a non-degree student specifically for the purpose of taking the class.
- Luna – a designer of professional development for teachers and a doctoral student in Instructional Technology with a focus on online professional development.

Data Collection

There were four primary methods that I used for data collection. Those methods were survey, semi-structured interview, participant observation, and document analysis.

Survey

Approximately one month prior to the start of the class, I emailed everyone who was enrolled in the course with a questionnaire. The purpose of this questionnaire was to gain an understanding of what types of epistemological beliefs teachers had prior to the class and to specifically identify class participants who were currently or had been K-12 teachers. I used the information gathered with this survey to identify three of the four educators that were the focus of in-depth case studies for the duration of the class. The

fourth case-study participant was not identified until the first day of class after I consulted with the course instructor and then personally approached the person who would become my fourth case-study participant.

Semi-structured interviews

Once the educators who were the focus of the case studies were identified, I conducted semi-structured interviews with each educator. The purpose of these interviews was to gain a more complete understanding of their beliefs. Specifically, I focused on determining how they developed their existing beliefs and how their beliefs as educators compared to what they believed as learners. Interviews were conducted again three to four months after the end of the course to determine if educators had experienced any level of conceptual change in terms of their epistemological beliefs.

Participant Observation

I was a participant observer (Spradley, 1980; Patton, 2002) for the duration of the Whale Class. Participant observation served an important role in this study. This method allowed me to document particular elements of the Whale Class that had an influence on educators' beliefs. As such, I was on hand to document the observable evidence of belief change on the part of participating teachers. I was also in a position to witness the conceptual change process of the teachers. This observation of the conceptual change process helped inform the development of the interview questions that I used at the end of the course.

There were many variables to consider when employing participant observation as a method of data collection including the level of participation ranging from non-participant to full participant and the degree to which those that are being investigated

know that a participant is also a researcher. In this study, I was a full participant as a learner in the class and also fully disclosed my role as researcher to all members of the class. In order to collect as much data as possible, I kept an audio recorder with me at all times and notified class members any time that it was in use. Additionally, video footage was also collected during class sessions, reflection sessions, and on board the whale watch.

Procedures

I secured permission from the course instructor to conduct research on the course and also gained Human Subjects Approval from the Institutional Review Board. Once the list of course participants was finalized, I informed all participants of my study and I asked them to sign consent forms to indicate their willingness to participate in the study. If any of the course participants had not been willing to participate, I would have excluded them from analysis of all data that directly involves them, however this did not happen to be the case. Further, I asked the specific educators who were the subjects of the individual case studies to sign an additional consent form since their role in the study was much larger.

I financed my own travel to the study location and paid all costs associated with course participation. I own an audio micro cassette recorder that I used during participant observation and interviews. The course was the subject of a documentary and therefore, I used video that was taken by the documentary videographer for dissertation data. Use of such video was approved by IRB and was indicated in the participant consent forms. Field notes were taken throughout the study, and when audio or video recording was not appropriate, I relied solely on field notes for data collection.

Timeline

The course began on July 8, 2006 in Salem, Massachusetts. All participants reserved their position in the course, registered for the course at the university, and made travel arrangements for getting to Boston on their own. I arrived at the study site along with one of my case-study participants, who also happens to be a personal friend, on the day before the other participants arrived. Data collection in the form of participant observation began as soon as I arrived at the study site and continued for the duration of the course.

The email questionnaire was administered to course participants approximately one month prior to the start of the course. Three of the four educators who were the subjects of the case studies were identified based on the questionnaire and pre-class interviews were conducted at least one week prior to the start of class. The fourth participant was not identified until the first day of class and was interviewed on the afternoon of the first day of the course approximately one hour before the first official class meeting. I transcribed the first three interviews before leaving for the class so that I could have a baseline from which to work as I collected data during the week of the class. I listened to the fourth case interview the night after the first class and made notes for observation for that particular participant.

As soon as the class began, I assumed the role of participant observer for the duration of the class. I had an audio recorder and digital camera with me at all times, but primarily used field notes as a main tool for data collection in order to be as unobtrusive as possible. I particularly focused on collecting data during class sessions, on the whale watching expeditions, and during daily reflections. As I made observations of possible

conceptual change on the part of the case study participants, I made field notes to focus on these events during the final interviews with case study participants.

After the course was over and participants had the full length of time to submit course deliverables, I conducted a final interview with each case study participant. I transcribed all interviews within one week of the time that they occurred. Preliminary data analysis began after the initial surveys were returned and continued into the fall of 2006. Table 4 is a visual outline of major data collection events over the course of this study.

Data Analysis

Because of the nature of this study and my desire to understand the nature of the conceptual change process that the educators experienced, I used conceptual change theory and transformational learning as a framework for the final interpretation of the data. However, even though there was a pre-determined theoretical framework for interpretation, it was important that I have as few pre-conceived notions as possible in the analysis stage of this study. As such, all interview, observation, video data, and documents were analyzed using an open coding format (Merriam, 1998). This is a technique in which I reviewed data multiple times looking for consistent themes that emerged from the data to help shed light on the nature of the situation under investigation. This was first done for each individual case study participant, and then across cases. Field notes were reviewed daily while in the field in order to identify themes for further focus while in the research setting.

Table 4

Timeline of Data Collection

Pre Class Events	May	May 16, 2006	IRB Approval
	June	June 8, 2006	Pre Class Survey Sent
		June 19, 2006	Pre Class Interview - Luna
		June 22, 2006	Pre Class Interview - Anne
		June 24, 2006	Pre Class Interview - Adrian
Class Week	July	July 8, 2006	Pre Class Interview - Allen/Class Begins
		July 18, 2006	Class Ends
Post Class Events	August		
	September		
	October	October 17, 2006	Post Class Interview - Luna
		October 24, 2006	Post Class Interview - Anne
	November	November 3, 2006	Post Class Interview - Adrian
		November 7, 2006	Post Class Interview - Allen

Analysis Procedures

After the class, I transcribed all interview data and arranged all transcripts and field notes by participant. This first grouping of the data was done so that I could focus on the personal experience of each participant. The intended outcome of this first level of analysis was a narrative for each participant, telling his or her story. These narratives are presented in Chapter 4. Once the first level of analysis was completed and the narratives were constructed, the narratives became a second source of data to include with the original transcripts, field notes and video. At this point, I temporarily hid the codes that were initially developed for each case and recoded with the purpose of capturing the story of the class as a whole. By looking across cases and narratives, and including all data at once rather than only the data for an individual subject, I was able to not only identify common themes that were experienced by each participant, but also see a broader picture that represented the experience of the class as a whole. This led to a cross-case narrative that is also presented in Chapter 4 before the individual narratives are presented in order to set the context in which each individual story takes place.

Finally, after all open coding had been conducted and narratives had been created to tell the story of each participant and the class as a whole, I applied the theoretical framework of conceptual change and transformational learning to examine the data in relation to specifics of this framework. The final interpretation of the data is presented in Chapter 5 – Analysis. An example transcript is included in the appendices to show the open coding process that I used. Also included in that sample transcript is evidence of the memoing process that I used during analysis. All codes and memos were achieved through the use of a Microsoft Word table and the comments feature of the software.

In presenting the data, I employed a form of narrative inquiry that Polkinghorne (1995) calls *narrative analysis.* In this form of analysis, the specific form that the analysis takes is an actual narrative, or story. Polkinghorne argues that storied expressions are grounded in "the phenomenon of individual protagonists engaged in an ordered transformation from an initial situation to a terminal situation (p.7)." This is appropriate in this particular study because of my interest in each of my case's transformation from one initial belief structure to another.

As a form of analysis, narrative analysis is different form other forms of narrative inquiry in its focus on the story that is the result of analysis. Many qualitative researchers have used the word "narrative" to describe their data. However, Polkinghorne makes the distinction of the different forms of narrative inquiry using Bruner's (1985) distinction between paradigmatic cognition and narrative cognition. Paradigmatic cognition, he argues, is what is most frequently implemented and represented in research studies and is the foundation for what he calls analysis of narratives. This type of inquiry focuses on identifying common elements across narratives (or stories) in order to identify a more generalizable reality that applies to many situations. Narrative analysis, on the other hand is rooted in narrative cognition, which looks to the individual story for situated meaning rather than across stories for general meaning. According to Polkinghorne, "the function of narrative analysis is to answer how and why a particular outcome came about (p.19)."

Using this distinction of narrative analysis versus other forms of narrative inquiry, I created each narrative by first identifying the outcome, or the *denouement* of each participant's belief change story within the data itself. By doing so, I was able to focus immediately on my primary research objective which was to determine if and in what

way the whale class influenced teacher's epistemological beliefs, i.e. the denouement given the story of my particular study's purpose. After identifying the ultimate outcome, I then examined all of the data for details that outlined the complete process of belief change for each case through a form of thematic coding. Through the structure of the plot, I aimed at highlighting specific elements that most directly aligned with observable epistemological belief change. In the resulting narratives I have used *italicized* font to indicate actual quotes from interviews or documents from the participants over the course of the study.

Validity and Reliability

As Patton (2002) points out, quantitative researchers test the validity of an instrument by carefully constructing the instrument and repeatedly using it in various settings. However, with qualitative research methods, and in particular, a case study design that relies heavily on participant observation, the researcher is the primary instrument for data collection. Given this situation, there are certain procedures that a researcher may use to improve the validity and reliability of the study findings. Specific procedures that I used are member checking, peer review, journaling, and the use of multiple methods to investigate each research question.

Member Checking

Member checking is a strategy in which the researcher allows the study participant to clarify and/or correct interpretations the researcher has made. This was done during interviews as I used probing questions, summarized participant responses, and asked for clarification. Also, during the week of the class, I reviewed my field notes daily and made notes of questions to ask participants to verify my interpretations of

behaviors after the course was completed and followed up on those questions in the post-course interviews. Finally, after the narratives were created for each participant, I shared each person's personal narrative with the participant and asked for any clarifications and for general approval or disapproval of the narrative. All participants felt that their own narrative was an accurate representation.

Peer Review

The use of a peer debriefer who is familiar with qualitative research methods is a common practice in qualitative research (Patton, 2002). I have a peer with whom I shared the analysis and findings of my study as they progressed. This person is a doctoral student in Instructional Technology, was with me on the boat during my first experience in the Whale Class during the summer of 2005, and helped me think through some of the questions and issues as I developed my ideas for this study. Further, she was on the boat again in the summer of 2006 collecting her own dissertation data, but with a different focus and different group of participants.

Journaling

Creswell (1997) advocates the importance of keeping a research journal as a means of increasing the reliability of qualitative research. Specifically, the research journal was a method of systematically tracking my thoughts, processes, personal reflections, hypothesis, and preliminary findings. I kept both a print and audio journal. The print journal was a method for immediate reflection and was more appropriate in public settings as not to cause a disruption in whatever setting I find myself. An audio journal allowed me to quickly articulate ideas and thoughts when time was in minimal supply.

Multiple Methods

The use of multiple methods to investigate a single question is what Denzin (1978) refers to as mythological triangulation. As mentioned above, there are four main methods that were used to investigate all of the research questions. Those methods are open-ended survey, semi-structure interviews, participant observation, and document analysis.

Limitations

Certainly within the current climate of educational policy, this study may seem insignificant to some since it does not attempt to verify or validate particular theories of learning or instructional models and offer "proof" of their impact on achievement of particular learning objectives. However, such a critique would indicate a perceived limitation of a relative/constructivist paradigm, rather than the study itself. And certainly, the influence of learning about the educational theories and models involved in this course was the focus of this study.

Aside from any philosophical disagreement with the paradigm used, which some may consider to be a limitation, another limitation of this study is the fact that I am a junior educational researcher. Though I have been a member of the research community for almost six years, I had been conducting research of my own for approximately three years at the time that this study began. Given this situation, I do not have the years of experience with particular methods of data collection and analysis that more seasoned researcher do. And as stated above, since the researcher is the primary research instrument in qualitative methods, this could be considered to be a genuine limitation. However, it is through practice and implementation that all researchers learn their craft.

Statement of Researcher's Bias

As the primary instrument for data collection, it is important that I fully disclose any biases I have that might have affected the collection and interpretation of the data.

I have always been fascinated by personal beliefs and how people develop their beliefs. I'm equally fascinated by religious beliefs, cultural beliefs, political beliefs, and educational beliefs alike. More specifically, I am mesmerized by the influence that personal beliefs seem to have on peoples' actions. In fact, when I was a teacher of professional development courses, it was a natural part of my curiosity to consider the power of teachers' beliefs and how those beliefs affect their practice and their willingness to adopt educational initiatives that are philosophically different from their beliefs. I carried this curiosity about beliefs into my doctoral program in into my research.

Having conducted an earlier study in which I interviewed teachers who had experienced a change in their educational beliefs, I knew that conceptual change was possible…even in the most devout follower of a particular educational philosophy. However, the particular study to which I refer was conducted with teachers who had already experienced a change in educational beliefs. So with this study, I hoped to witness and document the change process as it happened. This, of course, implies a huge assumption on my part that the Whale Class would be a promoter of conceptual change. However, having been a student in the Whale Class, I did know that in the past, the class has been a setting for conceptual change on the part of many of its students…including myself.

Given my personal bias toward the Whale Class as a potential setting for conceptual change, and my bias toward the particular type of educational belief structure

that is encouraged by the class, I had to guard against forcing my beliefs on the interpretation of the data. I had to be extra cautious in the type of data I gathered and guard against overlooking certain data that could contradict my assumption that teachers will experience conceptual change as a result of the Whale Class activities. I believe that I was successful in this effort.

Chapter Summary

In this chapter I presented my design for a multiple case study that investigated the influence of the Whale Class on the educational beliefs of participants in the class. Using survey, interview, observation, and document analysis techniques, my goal was to document the conceptual change process among members of the Whale Class. Through this study, I hope to influence the design of future courses and professional development for educators.

CHAPTER IV

FINDINGS

In this chapter, I share the findings of this study. Those findings are presented in the form of five narratives along with relevant elaboration that responds to the four research questions that I set out when I began this study. The first narrative is a direct response to the second research question of this study:

- What is the nature of the class that is the setting for any change in educators' beliefs?

I present this narrative first in order to establish the context within which the next four narratives are set and to establish themes that will be present within the narratives of each individual case study participant. Within each individual case study's narrative, I specifically address each the remaining three of the four research questions on an individual basis:

- What are the educator's epistemological beliefs before the class?
- What are the educator's epistemological beliefs after the class?
- What elements of the class can be attributed to any change in the educator's epistemological beliefs?

After all four cases are presented I will summarize the overall influence of the class on the participants' epistemological beliefs.

Context Narrative

The Whale Class of 2006

There is a documentary about the Whale Class that is in development at the time that I am writing up my findings. That documentary opens with the line; *We have a story to tell.* Indeed, there are multiple stories to tell from that extraordinary week in New England in the summer of 2006. They are the stories from the members of a community that developed and revolved around a shared passion for learning, and perhaps more specifically, for the whales.

Community

From the moment you arrive in Salem and meet John Schell, you know you're in for something special. *I think that John set the stage. He's a very warm person and you feel that the minute you meet him. He made me feel welcome* (Adrian). *I really like John and Barb Schell. I think they did an excellent job. They made you feel welcome* (Anne). Then as you meet everyone that is sharing the experience with you, you begin to truly understand that this is more than a group of people who are in a class together…it is a community. *In some ways it was kind of like a safety net. At first, we walk in there and we don't know each other. We're all just people. But as the week goes on, you really start to know each other. You start having a sense of feeling safe with that group of people and feeling like, "Well, if I say something that's sort of dumb, nobody's going to make fun of me. Somebody might help me to understand it better." And that made me feel like I was an important part of the group. You don't usually feel like that in a class. You learn to trust people very quickly* (Adrian).

The community wasn't limited to the students enrolled in the class. Many class members brought spouses, one student brought her son on the trip, another member's husband and daughter came to visit overnight, and the crew of the whale watching company was certainly part of the community. *I really loved being a part of the crew. The naturalists were very good. The interns that they had working with them were funny. And every so often you'd make a mistake and they would be very good about correcting you* (Anne). *I talked to Krista (resident naturalist) a lot about the whales. I went to her for all of my "what's this" questions.* (Adrian). *I enjoyed learning things from people that were around us. And not just the people that were experts, even the regular people that were on the boat. We all got to share what we thought.* (Allen).

Ultimately, the community was not just about whales or educational theory, it was about trust, the kind of trust that develops among a group of people when you've shared something incredible. When she was only three days into the experience, Adrian already knew the community was something special. *You know, I was thinking about the whole community aspect of it, and we're getting to know each other not just as educators, but as people. We're living together and learning each others' ideas and just kind of integrating some of those things into our own beliefs. And I just think that's amazing.* Luna reflected on the importance of the trust that developed in the community in relation to her ability to experience the emotion that went along with learning. *My understanding about the whales has grown not only by watching whales, but also by interacting with my classmates over there to a great extent. I remember my first day on the ship and we saw the humpbacks breaching. I saw myself just crying and I just couldn't explain why. It was just so beautiful and so pure. And I just looked to my left and saw that (another*

community member) was crying too. I don't know who else was there. All I remember is that she was crying and then she saw me crying as well. But we didn't ask each other, "Why did you cry?" I think we had a mutual understanding. I don't think that it can capture how I felt at the time. It was something indescribable, beyond words. And I know my other classmates must have felt in a similar way as well. And in that moment I think we constructed a huge foundation of trust, although we didn't communicate specifically about it.

Reflection/Remembering

The act of purposeful reflection can be a powerful process. Many researchers and theorists (King & Kitchner, 1994; Schön, 1987; Bushnell & Henry, 2003; Schell & Schell, in press) have made a case for the benefits of reflection for various purposes. In this particular situation, reflection activities were scheduled at the end of everyday of class to encourage participants to reflect on what they had seen and learned and how it connected with their life, practice, and ideas. What started as straight-forward recollection of events and impressions and a discussion of ideas on the first night, evolved into full displays of emotion and passion by the last night of reflection.

The first night of reflection happened after an incredible day at sea. As our naturalist said at the beginning of the reflection, *you know all of those things I was talking about it being spiritual for some people? Well, if it didn't happen for you today, it ain't gonna happen.* Indeed, the whales *seemed to know we were coming.* (Anne).

Adrian looked back on that first day in an interview for the documentary and recalled, *I was just out of control that first day. I was just yelling and screaming and jumping up and down and taking all kinds of video and pictures, and I just went nuts. And*

I realized later that, hey, maybe I should calm down a little bit. But really, that's what I was feeling. You just want to scream with joy. It's breath-taking and humbling at the same time because you realize how small you are. This personal level of reflection was present throughout the week for Adrian. In her personal blog (web based journal or log of her trip) she reflected on all aspects of the trip. Not only did she recall emotions and feeling about the whales, but she also reflected on her how much she was learning and what she planned to do with what she was learning to teach others and give back to society based on what she had learn.

Anne reflected in the style of a teacher preparing a formal lesson for her students. In her interview for the documentary when Anne was asked to recall her first day with the whales, she was very focused on the "facts" and specifics of what she saw. *We saw three different kinds of whales. We saw humpbacks which are the most prevalent, we saw minkes, and we saw finbacks. We saw a lot of different behaviors. We saw group feeding, we saw breeching which is when they come out of the water and kind of do summersault. It was very interesting to see their different kinds of behaviors and how it changes with the weather.* When reflecting on teaching she did on-board the boat, she focused on the analogies that she developed to convey the size of the whale to the passengers on the way out to see the whales. *I've explained about how big the whales are. They're the size of a semi truck. For a while I was giving the weight and everything, and it thought no, you have to identify it to something that people see on land. And the Minke whales were the size of an extra extended pickup truck. Then two semi trucks are the size of the fin whales. So people can kind of identify.*

Luna's reflective style was very metacognitive. When I asked her to share about her experience as if I had not been in New England with her, she recalled, *it was a course about situated learning and the way it goes is that you go there and you're completely situated and in this case watching whales. And you observe yourself metacognitiveley. Observe yourself how your understanding in whales grows overtime. And then how you feel differently and understand differently and see differently after being completely situated watching whales where there is no formal instruction or class.* However, this metacognitive focus did lead to a more global perspective. *It was really, really, truly amazing to be able to see myself learning all the facts in such a short time without having any formal lesson at all, and then being able to have an entirely different perspective toward nature and whales, and humanity.* Indeed the intent of her reflection may have been metagonitive, but part of the outcome was metaphysical.

Finally, Allen's reflection was not as obvious as the other case study participants…at least in what I was able to observe in his discussions. But in watching him while we were out on the water, I observed what I interpreted to be a deeply reflective nature in his demeanor. Even as we were traveling to and from the marine sanctuary where the whales could be found, I would find him standing alone, gazing out into the horizon, the look on his face peaceful and content with an ever present, yet ever so subtle grin on his face. His reflection may not have been shared through words, but it seems obvious to me that he had found some sort of deeper meaning in the experience. That meaning was articulated in his final reflection piece that is shared below in his personal story.

The Whales and the Environment

The common bond that united this unique community was the whales. Everyone knew that the class content was about situated cognition, contextual teaching and learning, and other theories about learning and education, which was of interest to every student in the class as educators of some sort. But it was the whales that drew them there and made them all want to leave their families and step out of their respective comfort zones for over a week to take the plunge. *It was kind of interesting. We had a gathering of people that had different interest, but we had one common interest – the whales* (Allen).

For some the anticipation of the power of the whales was expected far earlier than others. And everyone's reason for connecting with the whales was different, but the connection was still there. When I spoke with Adrian before the class began she emphasized her love of nature as a reason for going on the trip. *I know the class is going to teach me all this about situated cognition and working with groups and whatever, and that's fine. But personally, I'm looking forward to the whales.*

For Luna, the full appreciation of the whales didn't sink in until she had been out with them for several days and it was her love of learning that was her connection with the whales. *It was really, truly amazing to be able to see myself learning the facts and in such a short time without having any formal lessons at all, and then being able to have an entirely different perspective toward nature and whales. I never had a pet in my whole life before and I don't fancy the idea of having one because I'm very allergic and my whole family is allergic, so therefore, no pets in our whole family. But I adopted a whale family over there. It was sort of the natural choice for me; nobody forced me to do that.*

Anne shared her realization of the importance of what she had experienced with the whales after we had returned from the trip and had time to share her grand experience with others. *I'll probably be talking about this whale watch…oh…just about until they time they put me in the grave. I've done a lot of interesting things in my life, but this has got to be one of the most incredible ones.*

As impressive as the whales were, for many of the participants there was still something more. *I have this overall feeling of, just the immensity of nature in some ways. I know that's not really related to what the class is all about, but that's just kind of the feeling that I get. We live in such a small little world. We go to work, we do our thing, and we watch our kids. Most people don't get opportunities to go out and travel the world and go places and see cool things like that. It just fell so perfectly together the way our group was and the whales were, because there were a lot of parallels. The whales were migrating and they would hook up for a while and feed together and work together or whatever. And we were kind of the same way. We kind of migrated up there; we got to know each other for a few days and hung out, and went our own way. And you realize there are so many complexities to how the world works. I just had a very global kind of feeling about the whole thing* (Adrian.)

Overall, it was a culmination of these three major elements that created an environment that facilitated real change for each of my case studies. Without each of the elements of community, reflection, and the whales, this same experience would never have happened in the way that it did.

Case Narratives

In this next section, I present the narratives of the four case study participants who were the focus of my individual investigation. I present each person's story as an independent, self-contained analysis of the specific change that each person experienced as a result of the elements of community, reflection, and the whales. Through the presentation of each case in narrative form, I address research questions one, three, and four listed above, but more specifically, have attempted to represent the bigger picture of change for each participant – regardless of my particular research objectives. After each case is presented, I present a short discussion of epistemological change across cases in order to address the specific goal of this study.

Luna's Story

> Is it worth it? That was the question that began Luna's journey through an eight-day adventure in the summer of 2006. As a financially troubled graduate student from a foreign country, she *had a lot of doubt about whether this is worth spending nearly two thousand dollars when I'm driving a non-air conditioned car in Georgia.* She needed the cash. She would be *spending over a week* (gone to the class) *when I have to take my comps* (comprehensive exams) *within a couple of weeks.* She needed the time to focus and prepare. She had read all of the books and articles about situated learning and Communities of Practice multiple times. She knew all of the literature. She thought she *understood what Communities of Practice and situated learning is about already.* Would this experience really be worth it?

Even with her doubts, Luna was willing to take a chance. *Although I think I know all the grounded ideas and the concepts of it, being in there and experiencing it, might give me a totally different idea.* She hoped that there might be some deeper understanding of situated cognition that might be achieved by experiencing situated cognition rather than just reading about it. In talking with Luna, I could see that she had a very rich understanding of the theory. She was able to describe its application in online communities and how it was important for teachers to have a community to support their emotional needs not just their practical needs. However, as complete as her academic understanding of situated learning was, she didn't seem to have an understanding of the importance of emotions related to what was being learned. She saw emotions as a function of job performance for teachers. *Teacher attrition rate right now is calculated up to 40%. They are dropping out within 3 years of their teaching profession. And they indicate they are struggling emotionally. I think they do need help, and that's not the kind of help they can get just by using online resources.* Luna's belief about emotion in learning was that in order to learn, a person needs emotional support. She didn't have a full understanding of the emotions that happen and are related to the actual learning of content. That would soon change.

On our first day out on the sea, Luna made the direct connection between personal learning and the importance of emotions when learning. *When you are completely situated in the context, learning can be a lot*

more authentic, a lot more real, and then it can impact learners' level of cognition, but also it can impact a deeper side of learners thinking such as belief or philosophy or whole attitude. Those six days being on the ship makes me...not only helps me to understand a great deal about whales, but it somehow changed my whole attitude toward nature and whales. You know simply by knowing that there are other creatures on earth, you know, other than human. They are here living and what we do may harm them a lot in a way that we humans are not aware of, but it can harm them. And so, observing myself metacognitively, being so knowledgeable about whales and being an environmentalist within six days. It was amazing. It is hard enough to stimulate learners' cognitive domain, but it is almost impossible to stimulate learners' affective domain. If you allow students to be situated then there are a lot more opportunities to be able to touch that learner's affective domain side…. feelings, awareness, attitude, anxiety, and all that.

As is the case with most situations, everyone had a different reason for taking the "Whale Class." For Luna, this experience was about observing herself metacognitively. She knew that this class was designed to be a situated learning experience and she wanted to *see if it really works.* For her, this was a chance to see this sociological theory of learning in action. It was the experience of being a member of a community of practice that helped her to understand all of the complexity of this type of learning and knowledge. In looking back on the experience,

she had this to say. *You know at the end of the class I remember thinking it was almost the end of class the last day. I told myself, "I think $2000 was worth it." Yeah, I do not regret at all. It was what* [a friend] *said before while I was just calculating the money and time and all that and she said, "Think about five years later what this $2000 would mean to you later. Nothing. But if you invest that money and have this experience, then five years later you will be a different person." So I would say the same thing if somebody would consider going and is thinking whether this is worth it or not. Yeah. I'm going to say exactly the same thing that she told me.*

It was worth it.

Adrian's Story

After spending thirteen years as a Middle School teacher, Adrian needed a change. A traditionally trained teacher, she had become very frustrated by the lack of time, resources and support that she had as a classroom teacher. *I'm a little disillusioned at the moment with the whole teaching thing.* She didn't know what kind of change she was looking for, but she found it in the Whale Class. *Transformation. It changed my life. It really did…in a good way.*

Without being consciously aware of it, Adrian's epistemological beliefs had been restricted to viewing knowledge in terms of formal teaching and learning within the context of a classroom setting. She recognized the importance of presenting information to students so that it was relevant to real life, but she still viewed this "teaching" as a necessary

activity for meeting objectives. *I think that it's really important to teach, or help people learn, in realistic situations, but you can't do those things that are ideal all the time. It forces you to rethink, "Well, how can I do this? How can I reach this goal of helping this kid master such and such objective?" I love to think about what's ideal and try to keep it in the back of my mind, but I know that it is ideal…that it's not really going to happen that way.*

Once she was outside of the walls of her classroom, Adrian was able to think more globally about knowledge and the interconnectedness of life. *There're so many complexities to the whole, just how the world works, you know? Just how causes and effects and interrelationships between people and things. I don't know. It just had a very global kind of feeling about the whole thing. I'm usually a very detail oriented person, so that was hard for me. It made me think bigger than I usually do. I usually think very small. I felt a lot of opening of my mind to the whole cause and effect. I had a very strong sense of the interrelationships between things while I was there and I carried that with me.*

When I asked her what she felt helped her to develop this more global view of knowledge, she attributed it to a number of aspects of the experience that were important for her. In particular, she felt that the sense of community among the members of the group was a main contributor. *It's not a community, it's a family. That's bigger than a community in a lot of ways. In some ways it was kind of like a safety net. You start having a*

sense of feeling safe with that group of people and feeling like, "well, if I say something that sort of dumb, nobody's going to make fun of me or somebody might help me to understand it better by elaborating on something that I hadn't thought about." And it made me feel like I was an important part of the group. You don't usually feel like that in a class.

As interesting as the change in Adrian's epistemological beliefs are, there is a more significant change in her life plan based on this change that is indicative of the influence of the class on her life. She has re-enrolled in college as an undergraduate student in Ecology. *I have no reason. I have no explanation. I mean, I don't need another degree. I don't necessarily want another degree. And I may not get one. I really am much more interested in figuring out how I can be a better human being and how I can pass stuff on to my kids…how I can try to make the world a better place. So that's my reason for doing it. If get a degree out if it, great, if I don't who cares? At least I learned something. That's what's important.*

Indeed, Adrian's actions and words both indicated a belief in the importance of learning. Not just learning for the sake of reaching objectives as was the case before the class, but learning for the sake of being *a better human being.* In her own words, *it changed my life. It's something you can't explain to anybody who's never done it* (been a student in the class). *You can't. They would never understand.*

Anne's Story

Another one for the books. That seems to be what Anne's whole life has been about…having as many experiences as she can to add to her collection of stories. Though her career as a classroom teacher of Home Economics has been over for almost thirty years now, Anne will forever be a teacher. She never misses an opportunity to teach others about what she feels has been an important lesson for her. For example, she told me of a time when she was at a local football game and overheard a traditional college-aged student complaining about having to spend time with her grandmother. Anne's response upon overhearing that comment was, *"You know, honey. You wouldn't be on the face of the earth if it wasn't for your grandmother. I think you better rethink those 20 or 30 minutes you're going to have to spend with her. If she wants to give you a piece of wisdom, just shut up and listen occasionally."* Though this may seem harsh and judgmental, it was not intended that way by Anne. For her, her family was one of her most important teachers and she would like for everyone to be so lucky. The pride radiates as she talks about her own grandmothers and the influence that they and the rest of her family had on her own education. *Both of my grandmothers had college degrees. I've gotten to see a lot of schools, probably have been on a thousand college campuses, just because that was the emphasis of my family's upbringing. My siblings and I all had college degrees. My parents did. And my niece is the fourth generation of a woman to get her masters.*

In Anne's opinion, *everyone deserves a chance. And in America, because of our public school systems and our land-grant colleges, we are the only country on the face of the earth that ever tried to educate everyone, not just a select few.* This belief in the importance of education is characteristic of Anne's whole philosophy. But as illustrated by her comment above that the young lady should *shut up and listen*, formal education is not the only place a person can learn from. In fact, *if I could have gotten a degree in bus riding and talking to young people, I would have loved that. I have gained so much insight in today's youth.*

The whale class was no exception in terms of the informal, real life learning opportunity that the previous 50-some years had been for Anne. While she was certainly able to meet the requirements of the class in terms of assignments, in true Anne style, her greatest learning came from the experience and the people that she met and talked with. As she says, *I'm not the most quiet woman in the world.*

While many of the class members formed a tight community among themselves, Anne was often venturing out to meet as many new people as she could. One day when most of the class was acting as on-board educators, Anne was up in the bridge talking to the skipper of the boat. *I went up to the bridge. And I knew he was skilled. I could just tell by the way he navigated the boat. I went up there and we started talking. And he said he was from Cleveland. And I said well I've sailed at Mansfield. And he goes; well that's where I learned how to sail. He was a young kid*

when he started to sail like I was. So, that's where he and his dad had...his dad taught him to sail. He was a young kid when he started to sail like I was.

On the free day that the class had, Anne once again ventured out on her own to meet new people and learn new things. She walked down into Salem, stopping at a local roast beef restaurant along her way, making herself right at home with a grandmother with her two grandsons. After sharing her onion rings with the boys and learning of the best local attractions to visit while she was in town, she was off again to add to her adventure. This kind of connection with "strangers" is characteristic of Anne and the value she places on interpersonal relationships.

For all of her personal adventures, Anne still had time to make connections among her classmates. One person in particular is Luna. *She is so child like. Every time I was next to Luna when she saw a whale she grabbed my arm or my hand. She just was so excited. I mean so genuinely excited. And I was like, gosh. I mean I'm excited, too. But she is…it was so....joy, not only her face, her whole body radiated joy. And I think that was just wonderful.* As she reflects back on the time, she wonders about the members of the community that formed during those eight days. *I wonder about Adrian how she did with the kids, did they learn anything?* (Adrian's lesson for the class had been to take her own children whale-watching in Australia.) *I wonder about Allen. You know, is he married.* (Allen got married in October following the class.) *And the group that we*

went out with, they were just incredible people. And they really are committed to what they're doing and teaching the public.

For Anne, the whale class was definitely one for the books. *I talk about it all the time. I don't think there's a week that goes by that I don't talk about it. I bet every week I mention it to at least three or four people. I know it'll wane over time, but not yet.* And I have a feeling that even over time, this will still be one of the many animated stories in Anne's collection. *I think no matter what I do, I'll always have the whales.*

Allen's Story

For Allen, teaching was a side road that has turned into a career. *I really wasn't expecting to teach middle school starting out or high school later on. But it just happened to be that way, so it worked out really well.* Allen was trained in technical communications and was working in the corporate world as a web designer and drafting engineering plans when *they kinda dropped me in the back-door* as a teacher. He explained that he had a friend who needed some help setting up a lab at the school where the friend taught and oh, by the way, they needed a business and engineering teacher. *Yeah, I'll try that for a year and see how it goes.* Six years later it seems to be going pretty well.

When I first talked to Allen at the beginning of the class, I could tell that his experience from the business world had had a notable influence on his beliefs about the purpose of learning and the best way to learn. There was no hesitation in his response when I asked him what he

felt was the role of a teacher. *To prepare them for the workforce.* However, this direct response was quickly elaborated to expose more of his epistemological beliefs. *There are a lot of different things that go on beyond that though. We could teach a monkey how to turn a wrench, but there's a lot besides training a skill. As a teacher, you also really train a person. When you're hiring somebody, you're looking for the person behind the skills. They have to have both practical skills and social skills.*

Given this belief structure even at the start of the class, Allen's beliefs didn't really have much room for change. In his words, the class *just added rebar to the concrete.* That is not to say that the class was not a significant epistemological experience for him. Although the main structure was there, this class helped him to notice the complexities and interconnectedness of knowledge. *The more that you take in, the more you learn. Your philosophy becomes even wider so you're able to taken in even more.*

In his final reflection piece Allen wrote, *"Never fear to make a splash."* I find this quite interesting since the splash that Allen makes on the surface is not very big. For example, when I asked him about his overall feelings about the whole experience, his response was quite simply, *"it was really great."* But if you get a chance to look below the surface, you'll have the pleasure of witnessing a spectacular performance. My best opportunity to see what's below the surface was through his final reflection statement. *The environment is the one thing that we all have in*

common. By having the students interact with this one thing we all share, we are able to educate them far beyond the walls and time of the classroom experience. Education needs to be responsible. In teaching future engineers and other business leaders of the future, we must be prepared to share with them the importance of planning and acting appropriately for the present and future. We have one chance and we must act now to save what we have left because we depend on it.

Summary of Narratives

The use of narrative analysis techniques was intended to shed insight into how these four participants were changed as a result of their participation in the Whale Class of 2006, and as I pointed out in the identification of the themes that run across all cases in the first narrative, feelings of community and about the environment are part of what changed in each participant. However, the initial focus of this study was on epistemological change. Looking at these cases in terms of epistemological change, we can see that the Whale Class does have the potential to influence epistemological beliefs, at least in some cases. Table 5 below is a summary of the findings in terms of epistemological change and a short description of the end result in relation to each question for each participant. These descriptions are based on my analysis and understanding of each participant. Question two is not represented in this table since it is not specific to an individual participant's experience but rather the class as a whole.

Luna and Adrian in particular each moved more toward the situated/contextual end of the epistemological scale discussed in Chapter 2. Luna's beliefs shifted from those of a dutiful adherent to a particular academic understanding of a theory about learning to

Table 5

Summary of Findings

Research Questions	Luna	Adrian	Anne	Allen
What are the educator's epistemological beliefs before the class?	Stated belief in the situated perspective theory with little evidence of "living" the perspective.	Refers to ideas related to the situated perspective as "ideal" but not practical.	Personal contextual learning but "teaches" others what they "should" know.	Definite belief in the value of learning from the "real world" for the purpose of application.
What are the educator's epistemological beliefs after the class?	More appreciation for the role of emotion and experience in the development knowledge.	A belief about knowledge that is more informed by her personal learning experience rather than how she has helped hundreds of	Same – no transfer of her beliefs about her own personal knowledge development to how others develop knowledge.	Consistent belief in contextual learning with more emphasis on the relativity of all knowledge.

		others to learn and develop knowledge.		
What elements of the class can be attributed to any change in the educator's epistemological beliefs?	Learning within the context and the support of community members in the learning process.	The Whales, time for reflection on her own learning experience, and a supportive community.	No change observed	Reflection time to articulate and explore new ideas that were developed.

a devoted advocate for authentic experiences that promote complex learning in multiple domains including affective as well as cognitive. Adrian's change was from thinking like a traditionally trained teacher whose ideas were confined by the "realities" of education to a pioneering adventurer who sees learning as a necessary step to continually becoming a better, more complete person. There was not much observable change in Allen, however his epistemology was already aligned with the epistemology of the class. As he said, this experience "added rebar" to his solid beliefs in the importance of socially responsible education. However, he was able to articulate the importance of having had multiple contextual experiences after participation in the class. Finally, while Anne was certainly influenced by the class in terms of the adventures that she had and her appreciation of the experience, it did not seem to have an observable effect on her epistemological beliefs. Rather, this was one more story to tell in her life-long adventure.

Chapter Summary

In this chapter I have used the words of my participants and my observations of their actions during the week of the course to tell their stories and the story of the Whale Class of 2006. In the next chapter, I will present the analysis that is informed by the data presented above and my understanding of my theoretical framework which is a combination of conceptual change and transformational learning.

CHAPTER V

ANALYSIS

In the last chapter I presented the stories of the Whale Class of 2006 and four individuals that participated in the class. In this chapter, I present a cross-case analysis based on the theoretical framework for the design of this study which is a combination of conceptual change theory (Chinn & Brewer, 1993, 1998; Posner et. al, 1982; Davis, 2001) and Mezirow's (1991) theory of transformational learning.

Cross Case Analysis

While each case is presented as an independent narrative and is meant to capture the transformation of each participant in her/his own right, Polkinghorne (1995) reminds us that looking across cases can be useful in trying to come to some deeper understanding of a common experience. I found that this was particularly the case in comparing the four cases represented above and specifically looking at these cases in relation to the theoretical framework of conceptual change and transformational learning.

Making Meaning

As I approached this study, I turned to the literature to try to understand what others before me had learned from studying change. With a sound understanding of other researchers' theories about change, I was able to look at my data in a number of different ways including the category of conceptual change experienced by each participant, the conditions of conceptual change that were present for each participant, the elements of

conceptual change instruction that were present in the structure of the class, and finally the stages of transformation that each participant experienced.

Category of Conceptual Change

While I respected the work that Chinn and Brewer (1993, 1998) have done in the area of conceptual change, I did not initially find their specific model to be particularly useful in this study. I did consider the categories of conceptual change as I was evaluating the change experienced by each of my participants, but I did not find the categories of conceptual change to be as inclusive of the affective domain as I would have liked because of the theory's focus on "data." Indeed, I initially agreed with Pintritch et. al. (1993) that this particular model is too rational. It was clear with all of my case study participants that even if there was no change in concept, there was certainly an emotional change. However, when I reinterpreted the use of the word "data" to include emotional experiences that the participants experienced during the week, I found this theory to be quite interesting. Below are the possible categories according to Chinn and Brewer most recent publication with slight rewording on my part in order to include emotional data.

a. ignore the information and emotions experienced
b. reject the information and emotions experienced
c. profess uncertainty about the validity of the information and emotions
d. exclude the information or emotions
e. hold the information or emotions in abeyance
f. reinterpret the information or emotions
g. accept the information and/or emotions and make peripheral theory changes
h. accept the information and/or emotions and change theories

Luna and Allen

The category of conceptual change that best describes both Luna and Allen's change is a modification of category ***h – accept the information and/or emotions and change theories***. Luna and Allen both certainly accepted the emotions. In fact, as I discuss in their personal narratives, they already accepted the logical conceptual information of the situated perspective. Luna's insight into the connection between situated learning and other theories was quite insightful. *Situated learning is, in my understanding, is a notion that a persons' knowledge is socially situated. And this may sound too weird, but...are you familiar with Heigle's dialectics? It is about two contradictory energies meet each other and then produce something else. One thing is called thesis and the other power is called anti-thesis and they meet together and produces synthesis. My way of understanding learning is me producing synthesis.*

Allen, on the other hand, did not necessarily know the literature but certainly expressed an epistemology that was aligned with the concept. *I like to teach hands on things. My whole goal as a teacher is to prepare them for business life. So, if I start to see certain students that wouldn't normally take charge step up and actually take charge, that would be a good day. It's all towards business development and trying to get them to problem solve. That's priority one as far as I'm concerned with pre-engineering and what not.*

During the week of the Whale Class, both Luna and Allen were able to add emotion and experience to their concepts and *expand* their understandings of the situated perspective. *Before this trip I had a lot of doubt about whether this class is going to teach me anything different when I had read the articles and books already like twice, three times. I thought I understood what the communities of practice and situated learning are about already. But it was really, really, truly amazing to be able to see myself learning all the facts and in such a short time without having any formal lesson at all, and then being able to have an entirely different perspective toward nature and whales, and humanity and all that* (Luna).

For Allen, *It became much more than just a whale trip. It was actually kind of a gathering of people that had, we had different interests, but we had one common interest, too, which is kind of interesting…to be outside…more nature type of emphasis. I mean whether it was just whales or something else, you know something drew us to the class. For me it was whales. That was kind of neat. Then learning things from people that were around us, and not even just the people that were experts in it, even the common people that were on the boat. We all got to share what we thought.*

Based on this analysis, I would not say that either Luna or Allen changed their theory as indicated in category ***h***, but I do believe that they each developed a more complex understanding of the theory by accepting

additional data about the concept. Therefore, I would reword the category as ***h_2 – accept the information and/or emotions and* <u>expand</u> *theories.***

Adrian

While Luna and Allen's change was a modification of category ***h***, Adrian's change was a perfect example of ***h – accept the information and/or emotions and change theories***. There are a number of factors that I believe helped facilitate Adrian's change, one of the most significant being her decision to leave the classroom. When I first interviewed Adrian, she was still identifying herself as a teacher, even though she had already made the decision to not return to the classroom in the fall. Before the class, her concept of learning was in terms of what a teacher should do to help a student learn. *I think that it's really important to teach, or help people learn, in realistic situations. But you can't do those things that are ideal all the time. I love to think about what's ideal and try to keep it in the back of my mind, but I know that it is ideal…that it's not really going to happen that way.*

By the end of the class, and more specifically by the time I conducted the follow-up interview, her view of learning was that learning is a necessary feature of being involved in society. She has re-enrolled in college as an undergraduate student in Ecology and says, *I have no reason. I have no explanation. I mean, I don't need another degree. I don't necessarily want another degree. And I may not get one. I really am much more interested in figuring out how I can be a better human being and*

how I can pass stuff on to my kids…how I can try to make the world a better place. This represented a complete conceptual change and modification of existing theory.

Anne

Anne is an interesting case to categorize. In order to best understand her category of conceptual change, it is useful to examine the model in terms of the cognitive domain and the affective domain. In terms of her understanding of the concepts of the situated perspective and particularly communities of practice, she "learned" the information from the texts and could discuss the elements of the theories. She was an active participant in class discussions and often added creative insights that were eventually expressed in the form of poems in her final reflection. One poem in particular that she wrote expresses her understanding of the relativity of life experiences. It is called "A Lot of Grey."

Things are not always black or white

There is a lot of grey

We need to swim downstream

We need to swim upstream

And sometimes go with the tide

Or go against the tide

To find our own truth

In addition to her understanding of the situated perspective, she also learned a great deal about whales, their environment, the Northeastern

region, and its culture. In fact, in prose of her final reflection piece, she focused most of the content on the experiences that she had. This focus on the telling of the facts that she learned indicates that she still views knowledge as something that must be passed on from those that have it to those that don't. Therefore, I would say that Anne's category of change is ***e – hold the information and emotions at abeyance***. She can talk intelligently and in an informed manner about the situated perspective, but when she discussed teaching and learning in her reflection piece and in her final interview, she did so in terms of knowledge being something that is passed from one individual to another.

Conditions for Conceptual Change

I found the conditions for conceptual change (Posner et. al, 1982) to be particularly useful in helping me to evaluate the data and identify possible facilitators and inhibitor of change for my participants. According to the theory, there are conditions that must be present to facilitate optimal conceptual change. Those conditions are:

- The learner was dissatisfied with the existing concept,
- The learner felt the new concept was intelligible,
- The learner felt the new concept must be plausible, and
- The learner felt the new concept was fruitful.

The first condition – dissatisfaction with existing concept – was explicitly present in only Adrian's data. Her dissatisfaction with her existing concept of education and knowledge was evident in her choice to leave the classroom and in her discussion of the limitations that she faced as a teacher. *I'm a little disillusioned at the moment with the*

whole teaching thing in some ways. I wouldn't say that Luna or Allen was dissatisfied, but both were certainly open to an expansion and broadening of their existing concept. Each of them expressed openness and even anticipation for learning in their pre-class interviews. *Although I think I know all the grounded ideas and the concepts of it, being in there and experience it, might give me a totally different idea. So I'm looking forward to it* (Luna). *What really drew me to this course is the fact that we're really going out to really learn about something* (Allen). Finally, there was no specific indication that Anne was at all dissatisfied with her concept of the nature of knowledge.

Upon reviewing video of the class sessions in which the concepts were discussed and the lessons that were developed for the class assignments, I believe that all four of my case studies felt the concept was intelligible. Each participant was able to actively participate in the class discussions and apply the concepts in their lesson designs that were submitted for their class assignments. Excerpts from class assignments are included in the appendices to illustrate the each participant's understanding of the situated perspective.

The issue of plausibility was an evolving condition for several of my participants. For Luna, the concept of a community of practice was one that she believed in without ever having seen one in action. She trusted the theory and was designing professional development for teachers based on the concept, so she certainly believed it was plausible before the class. However, after having experienced a community of practice first hand, she has a confirmation of the concept's plausibility. *Observing myself metacognitively… being so knowledgeable about whales and being an environmentalist within six day…it was amazing.* Adrian was not at all convinced of the plausibility of a community of

practice before the class. In the pre-class interview she expressed that she *wasn't really a group person* and that she wasn't sure that groups always worked well for reaching learning objectives. After the class, however, she not only believed that a community of practice and the situative perspective was a plausible concept for understanding the nature of knowledge, but had significantly redefined her understanding of the social process of learning. Anne and Allen both expressed a belief in the plausibility of the situated perspective from the beginning of the study. However, there was a difference between the two in their views of the plausibility. Anne's belief in the plausibility of the theory came from her perspective of a student reading from a published text. The fact that there were texts and formal classes on the topic were enough to convince her that *there must be something to it.* Allen on the other hand, expressed his belief in the plausibility of the theory through examples that he gave of his personal beliefs before the class. *I think that there's a lot besides training a skill, you also really train a person.*

Finally, the perception of the fruitfulness of the concept was present in all four participants. Because this class was designed to be a situated learning experience in which the learners could study the theory and live the theory, it was quite easy for every participant to see the fruitfulness of this concept. Specifically, their learning about whales was explicitly situated within the context of the whale watching experience. None of the participants had ever even seen a whale (other than on television or in an aquarium) before the group's first day on the boat, much less taught anyone about them. However by the second day, they were all participating as on-board educators helping the other passengers to understand what they were seeing. All four participants made specific comments at the end of the class about how much they learned about the whales and their

environment and what they were sharing with others. Additionally, they all attributed that amount of learning to their situated experience.

Elements of Conceptual Change Instruction

All of the elements of conceptual change instruction as proposed by Davis (2001) seemed to be evident in the design of the class. The elements of instruction designed for the purpose of conceptual change include:

- Reveal student preconceptions,
- Discuss and evaluate preconceptions,
- Create conceptual conflict with those preconceptions, and
- Encourage and guide conceptual restructuring.

On the first night of class after all students had arrived, the first activity was to go around the room and allow each person to share his or her expectations for the week. Through this activity, the professor was able to determine what students' learning expectations were without specifically discussing their epistemological preconceptions. As the week went on and various educational theory topics were discussed, participants were given a chance to share their understanding of the theory and its relationship to their own concepts about knowledge, learning, and education. As participants expressed preconceptions that differed from the concepts being espoused by the curriculum of the whale class, the professor allowed for time to discuss and evaluate such preconceptions. By structuring the class as a first hand example of situated learning, the experiencing of the concept was designed to create conceptual conflict for those who were not completely convinced in the value of situated learning. Finally, conceptual restructuring was encouraged and guided through the use of daily reflection sessions in which participants

discussed both the theory and application of the situated perspective in relation to the day's event.

Stages of Transformation

Transformational learning theory is a complex theory with multiple stages. The ten stages of transformation as outlined by Mezirow (1991) include:

1. A disorienting dilemma
2. Self-examination with feelings of guilt or shame
3. A critical assessment of epistemic, sociocultural, or psychic assumptions
4. Recognition that one's discontent and the process of transformation are shared and that others have negotiated a similar change
5. Exploration of options for now roles, relationships, and actions
6. Planning of a course of action
7. Acquisition of knowledge and skills for implementing one's plans
8. Provisional trying of new roles
9. Building of competence and self-confidence in new roles and relationships
10. A reintegration into one's life on the basis of conditions dictated by one's new perspective (Mezirow, 1991, p. 168-69).

As I pointed out at the end of Chapter 4, Luna and Adrian are the two participants in this study whose epistemological change was significant enough to be considered transformational. Therefore, I will discuss this theory as it relates to those two participants.

Luna's Transformation

For Luna, the process of transformation began long before the start of the Whale Class. It started when she participated in a workshop related to the online professional development that she designs. After participating in that workshop, she realized that she had been designing something that she thought she understood until that point when she actually experienced it first hand. It was this disorienting dilemma that helped her realize that she may not have a complete understanding of Communities of Practice either and she wanted to experience one to *see if it really works.* In reflecting on that experience in the workshop, she expressed feelings of guilt and shame saying, how *did I do all the things without getting training so far? It was really an eye opening experience for me.* She went on to describe how this experience in the workshop had been shared with her colleague. *We both went through this training this time, and by the end of our training we thought we can't believe we've been doing this thing in this way for the last three years.*

It was at that point that Luna began to consider participation in the Whale Class as a way to experience more about the situated perspective. *Although I think I know all the grounded ideas and the concepts of it, being in there and experiencing it, might give me a totally different idea.* Upon arriving in Massachusetts for the class, she began fully participating in all activities and experienced a number of roles including mentor to one of the other students about the theory and educational apprentice on the

whale watching trips. Specifically with the whale watch, she gradually progressed from observer to full participant. There was one day in particular when an older Asian couple from the same country that Luna is from was on the boat. They did not speak any English, so Luna became their personal educator.

In the end, Luna's reintegration into her life based on her new perspective has been fairly seamless. She has participated in graduate classes on the topic of learning communities and has shared her experiences with others. Furthermore, she has integrated her new understanding of the situated perspective into her academic work as a doctoral student and into her practical work as a designer of online professional development.

Adrian's Transformation

The disorienting dilemma for Adrian was her decision to leave the classroom after thirteen years as a classroom teacher. For most of her adult life, Adrian had identified herself as a teacher and then suddenly, as she said on the first night of class when everyone was introducing themselves, *I'm nobody.* She was at a major transition point in her life and she knew it. This use of words such as being a "nobody" and saying in her interview for the documentary that *I'm nothing, really* indicated the self-examination that she was experiencing. In fact, during her interview for the documentary, she seemed to have a critical assessment moment when she declared herself to be a *life-long learner.* This was a critical moment when

she redefined herself from *former teacher* which describes the job she used to have, to *life-long learner* which is a more active classification of identity and how she chooses to be.

Based on this identity as a life-long learner and her experience in the Whale Class, Adrian actually re-enrolled in college as an undergraduate in Ecology which is a definite indication of planning a course of action and a desire to acquire new knowledge and skills for implementing her plan to *figure out how I can be a better human being and how I can pass stuff on to my kids…how I can try to make the world a better place.*

Indeed, this new role as student may or may not last. *If get a degree out if it, great, if I don't who cares? At least I learned something. That's what's important.* And even though this new role as student has not even begun yet, she is already building self-confidence in her new role as environmental activist as she has created brochures and materials for her friends and family on "10 Reasons to Help Save the Whales." This behavior is also a reintegration into her life based on her new perspective and mission.

Transformation Matrix

I have discussed the general process of transformation within the stories above. At the end of this chapter is a summary that restates each specific stage of transformation according to Mezirow (1991) with examples of behavior from the two participants that I found to have experienced transformation. The examples of

behavior indicate the presence of each stage of transformation and therefore support the claim that transformation has taken place.

Chapter Summary

In this chapter I have presented a detailed analysis of the findings in relation to my established theoretical framework. In doing so, I have used excerpts from the data to illustrate my line of reasoning for each claim that I have made in relation to the theories. In the next chapter, I will discuss the study as a whole and will then present the implications that I feel exist for the practice of professional development and my recommendations for further research in the area of epistemological change.

Table 6

Observed Stages of Transformation

Stage of Transformation	Luna	Adrian
A disorienting dilemma	Takes class related to assistantship work and realizes her room for growth in an area she "should know."	Decision to leave the classroom after 13 years identifying herself as a "teacher."
Self-examination with feelings of guilt or shame	Can't believe she has been designing based on a principle that she thought she understood, but obviously didn't.	Referring to herself as "nobody."
A critical assessment of epistemic, sociocultural, or psychic assumptions	Wonders if there may be a similar situation with her understanding of situated learning.	Reassessment of herself as "life-long learner" by mid-week.
Recognition that one's discontent and the process of transformation are shared and that others have negotiated a similar change	Shares with colleague on assistantship the similar feelings of guilt and shame.	Shares with Krista – resident naturalist – the process of redefining one's life.

Exploration of options for new roles, relationships, and actions	Considers possibility that Whale Class might be "worth it" and enrolls and engages in new relationships that help her develop a new understanding of community.	Shares several "what-if" scenarios during trips on the boat.
Planning of a course of action	Decides to enroll in Whale Class with hope of seeing a community of practice in practice.	Wants to "do something" to make a difference.
Acquisition of knowledge and skills for implementing one's plans	Participates fully in activities of the week, especially the community of developing whale experts.	Investigates different degree options based on her newly developing identity.
Provisional trying of new roles	Begins week on-board as educators with support of interns. Sees herself not just as the educator she expected to be, but also as a naturalist with an emotional connection	Enrolls in courses to begin degree in Ecology.

	with the whales, not just an intellectual understanding of them.	
Building of competence and self-confidence in new roles and relationships	By the end of the week is fully confident and competent as educator. Has developed a more personal connection with what she has learned and demonstrates that by adopting a whale.	Further develops knowledge through self-directed investigation and involvement with non-profit organizations.
A reintegration into one's life on the basis of conditions dictated by one's new perspective	Has evolved understanding of the role of community and emotion in learning. Shares experience and understanding with others.	Ongoing. Has planned and taken trips for entire family based on new values and perspective. Has gotten involved in children's school in a whole new way.

CHAPTER VI

DISCUSSION AND CONCLUSIONS

In the last chapter, I presented my analysis of the findings in terms of the specific theories of conceptual change and transformational learning. In this chapter I will present a more holistic discussion of this study and then present the implications that I feel exist for the practice of professional development and my recommendations for further research in the area of epistemological change.

Discussion of the Study

The goal of this study was to investigate the influence of the Whale Class on teachers' epistemological beliefs. Through the use of a qualitative ethnographic research design, I investigated the four research questions:

1. What are the educator's epistemological beliefs before the class?
2. What is the nature of the class that is the setting for any change in the educator's beliefs?
3. What are the educator's epistemological beliefs after the class?
4. What elements of the class can be attributed to any change in the educator's epistemological beliefs?

Through careful analysis I was able to determine that the Whale Class of 2006 influenced the epistemological beliefs of the four educators that I studied and encouraged beliefs that are consistent with the situated perspective. However, the influence of the

class was not a “light switch” effect. In other words, the change in epistemology that the members experienced was not an immediate change from having no epistemological beliefs (off state) to having those beliefs (on state). The influence was more like a transition from a particular set of beliefs that formed a starting point for each participant, to a more evolved belief structure that built on existing beliefs and was more inclusive of the situated perspective. Each participant was at a different point in her or his beliefs before their experience in the class, so the specific type of influence is different for each participant. Therefore, while I can claim that the experience did have an influence on each participant, I must be careful to point out that each experience was different for each participant and therefore there is no way to know for sure if similar results can be observed in future years of the Whale Class.

I was also able to determine that there are several elements of the Whale Class that seemed to have a significant role in influencing the educators’ beliefs. Those elements were use of reflection, the sense of community, and the context of the whales. As I will discuss in the next section, these particular findings have specific implications for the practice of developing professional development for adult learners.

Implications for Practice

As a result of my research and analysis, I see certain implications for teacher professional development specifically and adult education in general. Based on data from the participants and the themes that emerged as important elements of the class, I would recommend that professional development and adult education of any type:

- Make use of regular reflection throughout the experience.
- Foster the development of a sense of community among the participants.

- Remain sensitive to elements of transformational learning.

These two elements of professional development were not only illustrated to be influential in this current study, but also have support from the literature (King & Kitchener, 1994; Schön, 1983; Bushnell & Henry, 2003).

Regular Reflection

In the current study, reflection was employed in several forms that could be replicated in other types of professional development. Daily group reflection was the primary form of reflection that was used in the Whale Class. This method could easily be implemented in any professional development setting at the end of every session. Final reflection was also central to the design of the Whale Class. After the intense week of events, participants were encouraged to reflect on the experience as a whole. Again, this could easily be added to the design of any course or professional development experience to encourage educators to connect what was learned in the class with their normal routine as teachers. One final form of reflection that was not officially designed into the curriculum of the course, but would have been interesting is daily personal reflection. At least one of my case studies (Adrian) reflected daily in her personal online journal.

Developing Community

In order to facilitate the development of a sense of community within a group of educators, it is important to help the members of the community develop a sense of trust among the other members. This trust between the members of the class, including the peripheral members such as the instructor and educational interns on the boat, was evident in the case participants' conversations and their behavior during the week of the class. Specific activities that contributed to the development of that sense of community

were informal activities such as group dinners and side trips that helped participants develop relationships with each other outside of the formal structure of the class. These kinds of informal opportunities could be encouraged in any situated professional development opportunity as long as there is a certain amount of free time over the course of the activities.

Transformational Learning

Additionally, it seems that transformation (Mezirow, 1991) is certainly a possibility for participants in an experience such as the Whale Class. Therefore I would recommend that practitioners who are responsible for designing and/or delivering such experiences become familiar with the theory of transformational learning and be prepared for issues that may arise related to the transformation process. For example, as participants potentially experience feelings of guilt and shame related to a disorienting dilemma, professional development facilitators must be prepared to help participants negotiate these feelings. The establishment of a sense of community and the use of reflection can help with addressing such issues and take the pressure off of the instructor and help distribute the responsibility among the other participants. In fact, the use of community can help facilitate the other stages of transformation such as recognizing that one's discontent and the process of transformation are shared and that others have negotiated a similar change. However, as I will discuss in the next section, it is possible that "transformation" as Mezirow defines it is not the only theory to explain the change that some educators experience when a shift in epistemological belief occurs. Therefore, further research in the field is necessary.

Recommendations for Further Research

Based on the findings of this study and my experience collecting and analyzing the data, I have many recommendations for further research. Based on the literature, I have come to the conclusion that a teacher whose epistemology is aligned with the situated perspective and who exhibits such an epistemology in his or her practice will create more authentic learning environments for students. It is yet another conclusion based on the literature that authentic learning experiences foster higher student achievement. However, given the current political climate in education and the national focus on student achievement on standardized tests, I believe that many educational decision makers will not care about teachers' epistemology if it can't be directly linked with improved student achievement.

I would recommend that researchers take what is known about how to identify teachers' epistemology and investigate the relationship between teachers' epistemology and the achievement of students in their classes. This could be done in a number of ways. Based on the findings of this study and other research on epistemological change, I believe that an instrument for determining teachers' epistemological perspectives is possible. If such an instrument were tested, validated, and used in a large scale study to determine teachers' epistemologies, that data could then be correlated with student achievement data.

Other research that is needed in the area of epistemological change is similar to the current study. Based on the findings of this study, it would be productive to investigate the influence of other intense professional development classes on teachers' epistemological beliefs. More specifically, it would be interesting to have a larger number

of participants so that common characteristics of change could be more accurately and reliably predicted across categories of teachers such as elementary, middle grades, and secondary teachers; teachers of different subjects; adult educators and corporate trainers, etc. While transformational learning (Mezirow, 1991) was one way to investigate the change that educators experienced, it is entirely possible that there are other explanations for the process of change that educators might experience. A larger data set would allow for more detailed investigation into that change process that is unique to epistemological change. A larger data set would also allow for further modification of Chinn & Brewer's (1998) categories of conceptual change to be more inclusive of the affective domain.

Final Summary

In this chapter I have presented a general discussion of the study as a whole and I have also made recommendations for research and discussed the implications for practice. In this entire document, I presented an overview of the research design and the setting for the study, I summarized the literature related to epistemological change and the epistemology of the situated perspective, I presented my study design, and I presented the findings of my fieldwork followed by analysis connecting my findings with theory. Certainly, this was not the first study to investigate issue of epistemological belief change, nor will it be the last. However, I hope that by conducting this kind of in-depth investigation into the change process of four individuals, I have added to the greater understanding of what it means to believe.

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APPENDIX A

Participant Informed Consent

EOCS 8040 Case Study Participant Consent Form

I, _____, agree to participate in a research study titled "Teachers' Belief Change Process within a Situated Learning Experience " conducted by Christa Harrelson Deissler from the Department of Educational Psychology & Instructional Technology at the University of Georgia (542-8491) under the direction of Dr. Mike Orey, Department of Educational Psychology & Instructional Technology, University of Georgia (542-4028). I understand that my participation is voluntary. I can stop taking part without giving any reason, and without penalty. I can ask to have all of the information about me returned to me, removed from the research records, or destroyed.

The reason for this study is to determine what influence EOCS 8040 has on educators' beliefs and to document any change in beliefs that take place.

If I volunteer to take part in this study, I will be asked to do the following things:

1) Participate in all class activities which will be documented by the researcher.
2) Participate in a one-hour audio-taped interview to be scheduled at my convenience approximately one week before the start of the Whale Class.
3) Participate in a one-hour audio-taped follow-up interview to be scheduled at my convenience approximately one month after the end of the Whale Class.

Additionally, as a participant of this research study, I am aware of and acknowledge the following:

- All activities will be related to research.
- No identifying information about me, or provided by me during the research, will be shared with others without my written permission, unless required by law. I will be assigned a pseudonym and this pseudonym will be used in all of the researcher's data collection related to my activities during the course of the study and during all interviews.
- There will be no reasonably foreseeable risks and/or discomfort.
- Expected benefits could include an increased awareness of personal educational beliefs.
- All audio and video tapes will be kept indefinitely with all participants' approval. Tapes will be kept in a locked cabinet accessible only to the researcher. Participants will have the right to review/edit tapes by making a request to do so with the researcher. Transcriptions will have been removed of all individually identifying information and will be kept indefinitely.

The investigator will answer any further questions about the research, now or during the course of the project (542-8491).

I understand that I am agreeing by my signature on this form to take part in this research project and understand that I will receive a signed copy of this consent form for my records.

Christa Harrelson Deissler	_____	_____
Researcher	Signature	Date
Telephone: 706.542.8491		
Email: christah@uga.edu		
_____	_____	_____
Name of Participant	Signature	Date

Please sign both copies, keep one and return one to the researcher.

Additional questions or problems regarding your rights as a research participant should be addressed to The Chairperson, Institutional Review Board, University of Georgia, 612 Boyd Graduate Studies Research Center, Athens, Georgia 30602-7411; Telephone (706) 542-3199; E-Mail Address IRB@uga.edu

APPENDIX B

Participant Recruitment Email

Dear "Whale Class" participants,

My name is Christa Harrelson Deissler and I am a doctoral student in Instructional Technology and will be a student with you this summer in the Whale Class. And actually, I will be conducting my dissertation study during this summer's class and I hope that some of you will be my study participants.

The purpose of my study is to investigate the influence of the Whale Class on educators' beliefs about the nature of knowledge and learning. So if you are willing to answer just a few short questions, I would greatly appreciate it. By doing so, you will help me to get a primary understanding of the educational beliefs of the members in the class before the Whale Class starts.

Please know that your responses will be kept completely confidential. I will not share these with Dr. Shell or any other of the class members. This information is strictly for my research purposes only. If you have any questions about this study you can contact me at 706.542.8491 or by email at christah@uga.edu. By replying to this email you indicate your willingness to participate in this phase of my study.

Thanks in advance for your time and willingness to help me learn more about educators' beliefs.

Here are the questions.

Question 1:
What is your current job and student role? (ex. 8th grade teacher, doctoral student in Adult Education, Master's student and graduate assistant in Occupational Studies, etc.)

Question 2:
What are your career goals when you complete your degree?

Question 3:
What is your reason for signing up for this course?

Question 4:
In five sentences or less, what is your general educational philosophy?

Question 5:
Would you be willing to participate in two 1-hour interviews – one to take place a week before the class starts and one to take place a month after the class ends?

APPENDIX C

Pre-class Interview Protocol

What do you believe is the purpose of formal education?

What do you believe is your role and purpose as teacher?

How do you believe students learn best?

What has informed these beliefs?

Are you satisfied with your current view of learning?

Talk to me about your future plans as an educator.

Why are you/do you want to be an educator?

Describe a time when you feel like you personally learned something really well.

How does it make you feel to learn something?

Why do you think learning makes you feel that way?

How much do you know about the "whale class" before we go?

Are there any last comments you'd like to add?

APPENDIX D

Post Class Interview Protocol

Imagine that I've never been on the Whale Class and that I wasn't with you this summer.

Tell me about the class you took this summer.

What about the class sticks out most in your memory?

Do you feel like the class was or became a community of practice? Why or why not?

What about the members of the (class or community) sticks out most in your mind?

What do you feel is the connection between the curriculum of the class and you as an educator?

What role did the whales play?

Remind me - had you ever seen a whale before? When, where?

What people did you talk with the most during the week of the class?

- What would you talk about?
- How much did you talk about the ideas discussed in class?
- Can you share some of your recollections from those discussions?

How do you feel the whale class influenced your beliefs about education, learning, the environment?

APPENDIX E

Example of Open Coding with Memos

ID	*Q#*	*Turn #*	*Data*	*Notes*
CHD01	*1*	1.	*c: ok, this is interview one with Luna Lovegood who has agreed to participate in my study. Um, first of all, without giving your name necessarily, tell me what your degree objective is and your reason for taking the whale class.*	
CHD01	1	2.	L: ok, um, I'm a second year doctoral student in instructional technology and I'm pursuing a PhD degree,	Demographic data
CHD01	1	3.	and I'm taking this whale watching class to enhance my knowledge and skill in situated learning area	Reason for taking the class – to improve SL understanding
CHD01	*2*	4.	*c: ok. So, situated learning is something that you already know and understand?*	
CHD01	2	5.	L: I think so.	Believes she understands SL
CHD01	*3*	6.	*c: tell me what your understanding of sit learn is and why you thinks it's something worth knowing about*	
CHD01	3	7.	l: well, situated learning is, in my understandings is a notion that a persons' knowledge is socially situated	Description of understanding of situated learning
CHD01	3	8.	and it is worth know to me is that since I am involved in designing online communities for teachers	Relevance of situated learning to personal practice
CHD01	3	9.	thus I do believe that teachers knowledge is socially contextualized	Relevance of SL to teachers' practice

Comment [CHD1]: Fairly "text book" definition.

ID	*Q#*	*Turn #*	*Data*	*Notes*
CHD01	3	10.	so I had to have a deeper understanding in situated learning	Reason for learning about SL theory
CHD01	3	11.	because that is my philosophical stance for my entire research	View of SL as philosophy about learning (ie epistemology)
CHD01	3	12.	which is online community.	States her personal research focus
CHD01	*4*	13.	*c: ok. What drew you to it as a philosophical stance? Was it something that was suggested to you, or was is something that...*	
CHD01	4	14.	l: well I was introduced to it when I was getting into this field, online community.	How she learned about SL
CHD01	4	15.	It's not like I was born into it or it was my original philosophical stance, but.	Not a native belief
CHD01	4	16.	So I guess I didn't have a clear philosophical stance before that or anything object to that.	No clear belief before knowing SL
CHD01	4	17.	and then after I was introduced to that concept that I was deeply interested in	Statement of connection with SL
CHD01	4	18.	and then realized that we are actually learning everything in every second	Believes we're always learning
CHD01	4	19.	and that might be more true authentic learning	Believes this form of learning is "authentic"
CHD01	4	20.	than the learning that might happen in the classroom	Believes classroom learning is not authentic
CHD01	4	21.	and so that's how I got into this new notion.	Result of realization was connection to SL
CHD01	*5*	22.	*c: let's back-up from trying to define situated learning. that's what the whole class, you know that's the theoretical foundation for the whale class...*	

Comment [CHD2]: Is this a belief or just a recounting of a theory?

ID	Q#	Turn #	Data	Notes
CHD01	5	23.	l: yes	
CHD01	*6*	24.	*c: but my interest is in what teachers believe and why they believe it and of course I think connects and is related to situated learning. So what do you believe is the purpose of education...formal education. These teachers that you're trying to help them change their practice, what do you believe the purpose of what they do as teacher?*	
CHD01	6	25.	L: in formal education?	Clarifies question
CHD01	*6*	26.	*C: uh huh*	
CHD01	6	27.	l: um... this is what I memorized in my first undergraduate class from the college of education	Gives "memorized" definitions of purpose of learning
CHD01	6	28.	that the purpose of education is to develop a person's potential to a right way.	Purpose of education
CHD01	*6*	29.	*c: ok*	
CHD01	6	30.	l: and I still do believe that is the purpose of education and the ultimate goal that formal education is trying to reach.	States that she believes what she memorized
CHD01	*7*	31.	*c: so what do you mean by the "right way."*	
CHD01	7	32.	l: well, I haven't thought about that	Hasn't thought about what her belief means
CHD01	7	33.	but now that you're asking...	My question prompts her to reflect
CHD01	7	34.	right way must be the way to promote and help a person to reach their full potential to the way that each individual would want in their life.	Right way is about achieving personal best

Comment [CHD3]: "Right answer?"

ID	*Q#*	*Turn #*	*Data*	*Notes*
CHD01	7	35.	That might be the right way.	Statement of confirmation about belief
CHD01	7	36.	and the way to eventually contribute to a society they belong to and eventually work for humanity.	Right way is about contribution to society
CHD01	*8*	37.	*c: ok. you mentioned the class, the first class that you took in the college of education and that's what you memorized from that class as being how you got this belief. Can you recall what your belief about the purpose of education was before that class?*	
CHD01	8	38.	L: well, having my entire family teachers, or teaching professionals including hs, ms, elem school teachers, kindergarten schools, and principals.	Recalls family history of educators
CHD01	8	39.	it was natural for me to believe that education is something good and education is something really good for humans.	Natural belief that education is "good"
CHD01	8	40.	so I even believed that...stupidly... that education might be the best and only solution for any troubles we have	Qualifies old belief that Education can solve all the world's problems as stupid
CHD01	8	41.	and solution to suggest a better life for next generation.	Education as opportunity for "next generation."
CHD01	*9*	42.	*c: so does a better life mean financially better, social standing better, health, what?*	
CHD01	9	43.	l: I guess it is a overall meaning,	Defines "better life"
CHD01	9	44.	not only improve somebody's social economic status and finance,	Better life financially
CHD01	9	45.	but it would be more like they will have a more peaceful and clean and more dream achieving... I don't know how to put... more free world.	Spiritually better
CHD01	9	46.	and that the kind of environment that they will feel comfortable to try anything without any constraints or fear or limitations.	Personally empowered life

ID	Q#	Turn #	Data	Notes
CHD01	*10*	47.	*c: so to have that freedom to try anything and do anything implies a certain setting that they would have to be in as learners if we take that into formal education settings, that in the context of being a student, being a learner, to be able to try anything, I would think they would need a certain setting to have the comfort to be able to do that. what would hat setting look like to you that allows for a learner to be free to choose and try and experiment and learn things.*	
CHD01	*10*	48.	l: I think I got your point, but do you think you could repeat?	Clarification
CHD01	*10*	49.	*c: sure. you're comment was that you thought in education we should be free to try and do. and so what does a classroom or a learning experience look like what are the elements of that learning experience that will allow a learner to be...*	
CHD01	*10*	50.	l: are you specifically asking about classroom settings or just any condition?	Clarification
CHD01	*10*	51.	*c: I'm specifically trying to not say classroom settings. it can be a classroom, and you know we might try that. describe a classroom setting, a formal classroom setting, and maybe also and informal learning opportunity.*	
CHD01	*10*	52.	L; well, I think I got your point, but I'm not sure that my answer will be appropriate.	Doubts appropriateness of response
CHD01	*10*	53.	that's the thing that I've been always thinking.	Indicates her past thought on how best to learn.
CHD01	*10*	54.	I don't think it has anything to do with a very specific education setting.	Learning free from setting
CHD01	*10*	55.	it might be more related to what we are teaching to the kids.	The significance of the content of education
CHD01	*10*	56.	you know teaching them right ethics, right morals, teaching them compassion, and teaching about humanity and freedom,	Examples of what we should be teaching

ID	*Q#*	*Turn #*	*Data*	*Notes*
CHD01	*10*	57.	so that when they grow up then they will have full of the right ideas	Preparing “kids” for the future
CHD01	*10*	58.	that we might hope to insert into kids mind	“insert” ideas into the kids minds
CHD01	*10*	59.	and then they each contribute to human betterment by their own ways.	Purpose of ideas is to contribute to human kind
CHD01	*11*	60.	*c: ok. so that sound like the “what” they should learn, but how can they learn that?*	
CHD01	11	61.	L. I haven't thought about that.	
CHD01	11	62.	that might be able to achieve both in formal and informal ways I think.	Ways to learn
CHD01	*12*	63.	*c: ok. so they could learn that through a classroom?*	
CHD01	12	64.	l: I think so.	
CHD01	*13*	65.	*c: ok. um. I’m not really sure how to go with this now. well, I’m districted by the noise. I will not do the next interview here that's for sure. it's ok, it's not your fault. alright, I think we've covered my official question but we having quite gotten everything I wanna get for a first interview, so let's just kinda talk through it, work through it. hum. I’m sorry for being a bad interviewer.*	
CHD01	13	66.	l: that's alright. I mean I’m just kind of enjoying this conversation.	
CHD01	13	67.	nobody ever asks me this kind of thing.	Appreciation for getting to discuss ideas

ID	*Q#*	*Turn #*	*Data*	*Notes*
CHD01	*14*	68.	*c: yea, well and I think it's important to talk to educators about their beliefs. you know that's the stated purpose of my study. so I'm just learning how to try and figure out how people have developed the beliefs that they have and um...*	
CHD01	14	69.	L: developed the beliefs that I have? you mean the pedagogical beliefs especially?	Clarifying
CHD01	*14*	70.	*c: sure that's one of the beliefs. Epistemology too, is another thing. so the nature of knowledge and how it is that we know what we know. so what is something that you accept to be true? just unquestionably true.*	
CHD01	14	71.	l: again, I'm not sure whether this is the right direction of the answer,	Doubt about appropriateness of answer
CHD01	14	72.	but I believe in irreversibility of things. I believe that nothing is reversible in nature. Therefore you really cannot go back to the original status.	Belief of irreversibility
CHD01	14	73.	I'm different Luna Lovegood from the Luna Lovegood 3 seconds ago.	Impact of irreversibility
CHD01	14	74.	thus it doesn't make any sense if you believe that things can be repeated or that things were true 3 seconds ago can be true at this point.	Conflict if irreversibility is the case
CHD01	*15*	75.	*c: so truth is ever changing*	
CHD01	15	76.	l: I guess so. it should be changed. And then that's the way the entire humanity is developing.	Belief that truth is ever changing
CHD01	15	77.	if things only repeating by themselves then we are doomed 100 years later.	Reason why truth should be ever changing
CHD01	15	78.	and then should be changed and then facts should be developed and improved. that's my big...how can I say...that's the way I understand the whole universe.	Connection of belief about truth to understanding of the universe

ID	Q#	Turn #	Data	Notes
CHD01	*16*	79.	*c: ok. what are the components then, the elements that create that reality that things are always changing? what are all the factors that are affecting those changes and causing that irreversibility?*	
CHD01	16	80.	l: well, I guess, first of all my physical being. we are getting aged every second.	Physical aspects of irreversibility
CHD01	16	81.	and second, indefinite layers of the things that surround me.	Multiple influences on irreversibility
CHD01	16	82.	the interaction that I have with every single component around me. for example I'm having a conversation with you this itself has a certain affect on myself and I got improved, I think.	Irreversibility as a good thing
CHD01	16	83.	so human interaction.	Human influences on change
CHD01	16	84.	or physical environment.	Physical influences on change
CHD01	16	85.	or every little learning that I have out of the context.	Learning influences on change
CHD01	*17*	86.	*c: what does it mean for you to learn?*	
CHD01	17	87.	l: um...my belief is... this may sound too weird, but... are you familiar with Heigle's dialectics? that...	Starts to talk about beliefs about learning
CHD01	*17*	88.	*c: <shakes head>*	
CHD01	17	89.	l: ok. it is about two contradictory energies meet each other and then produce something else and then, the one thing is called thesis and the other power is called anti-thesis and they meet together and produces synthesis.	Explains dialectics – thesis, antithesis and synthesis
CHD01	17	90.	and then my way of understanding learning is that me producing synthesis.	Analogy of learning as synthesis

Comment [CHD4]: Understanding of interconnectedness of life.

ID	*Q#*	*Turn #*	*Data*	*Notes*
CHD01	17	91.	an important concept of this dialectics is that theses and anti-theses are not something against each other. they meet, in one dimension to produce another thing.	Explains that thesis and antithesis are complementary, not opposing forces
CHD01	17	92.	and I understand that I face a different system every second...you, and this coffee, and this entire new environment....	Examples of forces acting on her
CHD01	17	93.	and then my concepts somehow face different ideas and then somehow got evolutionized into a different being and that's synthesis.	Personalized ideas and learning as a form of synthesis
CHD01	17	94.	which is not against to any other concept, it just stays in one unity.	Inclusion of new ideas into existing framework to create new reality
CHD01	17	95.	that's how I understand learning.	Confirming statement
CHD01	*18*	96.	*c; ok. what kinds of feelings and emotions do you have that are associated with synthesis or learning? when you feel like you have had an experience like the one that you just described that is synthesis.*	
CHD01	18	97.	l: emotions and feelings? how I feel about it?	Clarifying
CHD01	*18*	98.	*c: uh huh.*	*Confirm*
CHD01	18	99.	l: you mean...could you… rephrase that...does that mean like I feel happy or something?	Clarifying
CHD01	*18*	100.	*c: sure.*	*Confirm*
CHD01	18	101.	l: <hesitant> oooh kay. um. it should be, I think you mean more than...really? it's like...wha...what do you exactly.	Clarify
CHD01	*18*	102.	*c: I mean what does it make you...how does it make you feel?*	*Restating question*

ID	*Q#*	*Turn #*	*Data*	*Notes*
CHD01	18	103.	l: ok. uh when I feel like I learn something?	Confirm
CHD01	*18*	104.	*c; um hum.*	*Confirm*
CHD01	18	105.	l: um I'm happy.	Learning makes her feel happy
CHD01	*18*	106.	*c: ok.*	
CHD01	18	107.	l: I'm very happy	Confirm
CHD01	18	108.	and I personally just kind of my habit that I forced myself to have since the beginning of my graduate study. Every night before I sleep I ask myself what did you learn today?	Habit of asking self what she learned – learning is important to her
CHD01	18	109.	did you ever get improved?	Learning as improvement
CHD01	18	110.	are you the same Luna...	Learning as change
CHD01	18	111.	and then when I figure out something that I learn today then I feel much better.	Learning as empowerment
CHD01	*19*	112.	*c; why do you think it makes you feel better?*	
CHD01	19	113.	l; um, I have a natural curiosity about every little thing in nature. when I found out the things that I never new before.	Natural curiosity is reason for wanting to learn
CHD01	19	114.	and I know that how those little learnings changed peoples lives.	Learning as change
CHD01	19	115.	before I learned about dialectics I was living in complete confusion and chaos. and before I learn about systems theory or the theory of chaos, I was simply living in real chaos.	Life before learning of current specific belief system

ID	*Q#*	*Turn #*	*Data*	*Notes*
CHD01	19	116.	and I've been thinking about...it's for example, what do we have to learn all those little concepts while I'm studying instructional technology. why do I have care about social theory? why do I have to care about human intelligence and everything...and psychology. and then I've been thinking about that since it was my major in my undergraduate. I've been thinking about it for years.	Past lack of understanding of importance of seemingly irrelevant information to purpose of learning
CHD01	19	117.	and then one day I just accidentally encountered the theory about the theory of chaos,	Unintentional exposure to and learning of chaos theory
CHD01	19	118.	and then I realized, and then I thought I got the answer and finally understood how things are working in the system.	Belief that she understood how things work
CHD01	19	119.	and it was such a liberating experience. and I think I remember I cried a little.< laughs>	Liberation of learning
CHD01	19	120.	*c: yea?*	
CHD01	19	121.	l: yeah. and then so, I love learning things.	Passion for learning
CHD01	19	122.	it just saved me from chaos.	Power of learning
CHD01	19	123.	if something doesn't make sense to me then I think about it death...and like that.	Strong feelings related to not understanding things
CHD01	*20*	124.	*c: how do you feel like your learning is helping you be a better person? you said earlier that learning should help people be a better person.*	
CHD01	20	125.	l: how does learning make me a better person?	Clarify
CHD01	20	126.	*c: yeah, personally, how does your personal learning made you a better person, helped you be more complete? how has it "developed your potential to a right way?"*	

ID	Q#	Turn #	Data	Notes
CHD01	20	127.	l: I hate to go back to the same issue of dialectics, but when I finally figured out what dialectics means, I realized that to make an improvement, you need two different energies. you need diverseness to make an improvement. and that just struck me, like, I finally figured out why diversity is so important in humans lives.	Importance of diversity for synthesis/learning
CHD01	20	128.	I used to think about like, you know, you need to be nice to people. you know, you don't want to offend anybody and be a better friend and neighbor.	Past belief about being nice to people in spite of differences
CHD01	20	129.	but after that, my understanding toward diversity now has a lot more logical understandings in it.	"Logical" understanding of import of diversity
CHD01	20	130.	it's not only to be nice to people. diversity is essential and critical to make an improvement.	Diversity for the sake of improvement
CHD01	20	131.	you're living in closed system, ignoring entire surrounding systems which are evolved every systems,	Not in the system if you're closed
CHD01	20	132.	you're going to be doomed in 10 years.	Impact of being in closed system
CHD01	20	133.	so you need the diversity to survive.	Diversity is not a closed system
CHD01	20	134.	so having that logical understanding in diversity just changed my entire view toward world and toward people.	Learning of significance of diversity changed understanding of the world
CHD01	*21*	135.	*c; have you tried to share tat understanding?*	
CHD01	21	136.	l: uh uh. no. <laughs> I read a lot of books on these kind of things,	Books as personal learning about ideas
CHD01	21	137.	but it's so hard to find a chance to share this kind of thinking.	Difficulties is socially sharing learning
CHD01	21	138.	and as I said, this is the first time that I say anything about this to anybody.	Being asked was impetus to share understanding

Comment [CHD5]: This is not as socially situated as it could be

ID	Q#	Turn #	Data	Notes
CHD01	*22*	139.	*c; ok. well in what ways then, you haven't tried to share your understanding of how important diversity is to other people. but because you have discovered the importance of diversity I'm assuming you've done some things in your life to try to incorporate diversity into your personal life. is that accurate? and if so, what kinds of things have you done?*	
CHD01	22	140.	l: well, other than just change, my concept change, how this actually applies to my real life?	Refers to learning as "concept change"
CHD01	*22*	141.	*c: uh huh.*	*Confirm*
CHD01	22	142.	l: I think I became, I tried to hear more ideas of other people. try to have friends who are coming from different background	Ways she applied book learning
CHD01	22	143.	and then understand that every contradictions that I might have with my friends or family is actually the source of my improvement. if somebody is coming from completely different background says something weird thing...I'm trying to listen, I think.	Connect to future learning as sources of personal improvement
CHD01	22	144.	I'm not backing off. just...that' must be something.	Reflection on how connections are working
CHD01	*23*	145.	*c: ok, good. I'll kinda change gears now. when you're finish with your PhD, what do you hope to do wit your career?*	
CHD01	23	146.	l: um, I'd like to be a researcher in a research institution or faculty in a college.	Career goals
CHD01	*24*	147.	*c: ok. so as a researcher, you would be strictly conducting research, no teaching responsibilities?*	
CHD01	24	148.	l: well, teaching...I didn't have any intention to have a teaching responsibilities, I just simply wanted to be a researcher.	Indication that past plans are changed from research only to include teaching
CHD01	24	149.	then while collaborating with the faculty during the last 2 years of my doctoral studies, I realized that how important for you to open your door and keep communicating with, especially with young people.	Reason for changing past plans

Comment [CHD6]: Consistent talk of learning in relations to information or facts. Very little affective/emotion.

ID	*Q#*	*Turn #*	*Data*	*Notes*
CHD01	24	150.	and then how big influences you can have with each other.	Importance of teaching
CHD01	24	151.	and then I say to myself it might be better than just staying in your own cell and doing something and then publish it to the world. so I guess I'll be ok with either way.	Why teaching is better than research only
CHD01	*25*	152.	*c: ok. do you feel like publishing is a way of teaching?*	
CHD01	25	153.	l: way of teaching?	Clarify
CHD01	25	154.	yes. I actually believe that that is a way to be immortal. <laughs> I'm not trying to be...	Teaching as a way to be immortal
CHD01	*25*	155.	*c: no, no, I understand...*	
CHD01	25	156.	l: I'm not like voldemort kind of person...	Reference to Harry Potter
CHD01	*25*	157.	*c: <laughs>*	
CHD01	25	158.	l: you know, try to live forever. <laughing>	Continued reference
CHD01	25	159.	I think that's the most dignified way of influencing or handing out, or contributing to the work as a scholar. I'm not going to go out to make a performance or sing or anything,	Talks of ways to contribute as a scholar
CHD01	25	160.	but I will keep my heart humble and try to remember why I got into this area.	Talks about character attributes she hopes to keep
CHD01	25	161.	and then I believe my work will be genuine, will be truthful to me.	Hopes for work to be genuine
CHD01	25	162.	then such truthful work will have its own contribution to the community.	Importance of the writing

Comment [CHD7]: She's getting out of her "closed system" by interacting with the rest of the system – the students.

Comment [CHD8]: This is a "relative" idea

ID	*Q#*	*Turn #*	*Data*	*Notes*
CHD01	*26*	163.	*c; ok. you said this area, what is this area?*	
CHD01	26	164.	l: um. education.	Clarifying
CHD01	*26*	165.	*c: education in general?*	*Clarify*
CHD01	26	166.	l: it was education in general when I got into the college of education 10 years ago. so, I guess my...and then	History of her area
CHD01	26	167.	I got into the college of education because I loved the whole idea of education.	Reason for getting into education – loving idea
CHD01	26	168.	but then I had my chance to develop my philosophy that I want to do in education, to do something good for people. so it was very big.	Philosophy of wanting to do something good.
CHD01	26	169.	and then I got the college masters program at Penn state, I got sophisticated a little, into a…that I want to...I guess it's not really sophisticated. I thought it was sophisticated but it's not.	Ideas evolved and got more sophisticated
CHD01	26	170.	I want to contribute to developing the better environment for the next generation.	Making better for next generation
CHD01	26	171.	that was the first time that I thought about the idea of the next generation. I always thought that doing something good for people. but I realize that the target audience for my work should be next generation. that we are not the wonders of this world.	First time identifying next generation as reason for getting into education
CHD01	26	172.	and then there are other people who have to live on this place.	Taking care of the world for others
CHD01	*27*	173.	*c: so how odes that connect to your career goals. how does your desire to help the world be a better place connect to what your personal action plan is?*	

ID	Q#	Turn #	Data	Notes
CHD01	27	174.	l: um, as I said, I do believe that by publishing a truthful work, could have its own contribution or.. you know. could have it's own contributions to people. so that's my way of contributing to the world. I guess by being researcher is kind of the way to do such things, publish such things. and then...yes.	Publishing understandings as a way of contributing to the world
CHD01	*28*	175.	*c: ok. what are you gonna research?*	
CHD01	28	176.	l: I always thought...just stop me of we going somewhere too far away....	
CHD01	*28*	177.	*c: we're just following this train where it goes...*	
CHD01	28	178.	l: <laughs>	
CHD01	*28*	179.	*c: <laughing> I'm having a great time.*	
CHD01	28	180.	l: ok. um. I always wanted to do something with teachers. and then, so that's why I was.	In the past wanted to work with teachers
CHD01	28	181.	and then I was involved in nation wide teacher education project when I was a masters student	Work in masters with teachers
CHD01	28	182.	which lead me into this whole BRIDGE which is the project for my doctoral study.	Masters work related to doctoral work
CHD01	28	183.	and then I had my passion doing something for teachers for the last 2 years,	Working with teachers was passion
CHD01	28	184.	but I don't know now.	Questions this line of work
CHD01	28	185.	I got so much, ahhh, I can say, discourage by people's comment	Discouragement from others on working with teachers

Comment [CHD9]: Caring for others by sharing information

ID	*Q#*	*Turn #*	*Data*	*Notes*
CHD01	28	186.	that unless you have taught before, unless you have some experience with American educational system, you might not be welcome.	Lack of experience as teachers is reason for discouragement
CHD01	28	187.	or teachers will have a huge prejudice, like you haven't been teaching before and what do you know about being a teacher or something like that. and then that precautions...	Others tell her that teachers will be prejudiced b/c of lack of exp
CHD01	28	188.	it was ok. it was doable for the last 2 years. and I always...I'll have my contributions. I got something that no other teachers will have.	Discouragement not a problem for first 2 years
CHD01	28	189.	then I got discouraged when somehow that issue just pops up for every situation that I'm going, the classes that I'm going, the training that I'm going, the workshops that I'm going, even the during the conversation with doctoral student or faculty.	Repeated discouragement makes it an issue
CHD01	28	190.	and then now I think, maybe they are right.	Begins to agree with view of others
CHD01	*29*	191.	*c: well, who is it that's saying that you won't be welcome? is it the teachers themselves that have an issue.*	
CHD01	29	192.	l: maybe the words 'you are not going to be welcome' might be too strong,	Second guesses wording of "not welcome"
CHD01	29	193.	it's like they said, teachers would not be so...that they might have their own prejudices for the fact that you have not been teaching before.	Restates idea of teacher prejudice
CHD01	29	194.	and then they have prejudices with everyone who has not taught before.	Considers herself in "everyone who has not taught" group
CHD01	*30*	195.	*c; is that something, though, that the professors and your peers are telling you something to look out for? or is that something that teachers that you have gotten from actual teachers when you've done work with them?*	
CHD01	30	196.	l: both.	Clarifying

ID	*Q#*	*Turn #*	*Data*	*Notes*
CHD01	*30*	197.	*c: both?*	
CHD01	30	198.	l: yes. and then its like,	
CHD01	30	199.	I'm not blaming them...it's my own feeling.	Accepts blame for feeling
CHD01	30	200.	and then now that I have a fiancé from different country and we are thinking of having an option to move out a different country. we don't know. this country is one of the options. but, we might have other options as well.	Need for versatile career because of family/fiancé plans.
CHD01	30	201.	and then teacher education is very much contextualized in every country. they have their own culture and everything.	Reason for need for versatility – contextualized nature of education
CHD01	30	202.	and then so if I specialized in teacher education in America. it might not work in Australia, or New Zealand, or any other European countries.	Possible settings for future work
CHD01	30	203.	then I have to again try to get myself to be accustomed with the whole new contextualized...	Getting accustomed to new context – reason for needing to consider other career options/expertise
CHD01	30	204.	and then I thought would this be a right way?	Second guesses the reconsideration
CHD01	30	205.	and then one of my committee members during my POS meeting told me that since I have a huge passion on this online community...	Other person helps her see online community as passion rather than teachers
CHD01	30	206.	I do. it really resonated with the way I see the universe....	Restates how online connects with personal views

ID	*Q#*	*Turn #*	*Data*	*Notes*
CHD01	30	207.	maybe I need to specialize myself as a online community specialist. not as a teacher educator	Reframes expertise as online rather than teacher ed
CHD01	30	208.	which requires a huge contextual knowledge and experiences.	Importance and value of contextual knowledge
CHD01	30	209.	and I think she's right.	Verifies committee members' assessment of situation
CHD01	30	210.	and then, I, the most of the readings I do during my free time. the readings about chaos theory and complexity theory, and evolution theory, they are all related to the concept of online community.	Sees connection between readings she chooses in personal time and online community
CHD01	30	211.	and group of teachers is just one of the audiences that I can just help.	Makes connection back to teachers
CHD01	30	212.	so if I specialize myself as an online community specialist then might be able to help build a community for parents, child, and not only teachers.	Expands possibility of using expertise in online with others
CHD01	30	213.	and then so that way, I don't need to loose my passion towards teachers,	Sees way to keep existing passion,
CHD01	30	214.	but also I can have wider options for my future.	Expands passion for future
CHD01	30	215.	and actually I can do what I really love to do...you know work in online communities.	Redefines passion as online rather than teachers
CHD01	*31*	216.	*c; Ok. how does situated learning influence your...*	
CHD01	31	217.	l: they systems theory and online community stuff?	Clarifying
CHD01	*31*	218.	*c; yeah, how do online communities relate to situated learning theory.*	*Confirming*

ID	*Q#*	*Turn #*	*Data*	*Notes*
CHD01	31	219.	l: oh that's uh...the philosophical stance and theoretical framework of online community is community of practice. and then...	States SL is theory supporting online comm.
CHD01	*31*	220.	*c; so what about communities of practice...I'm familiar with it.*	
CHD01	31	221.	l: I think so <laughs>	
CHD01	*31*	222.	*c: what component of communities of practice do you see in online communities?*	
CHD01	31	223.	l: what... um...	
CHD01	*31*	224.	*c: assume I don't know anything about communities of practice...*	
CHD01	31	225.	l: <laughs> ok. um. the very basic nature of the notion of community of practice is I believe that you are constantly getting into new communities of practice.	CoPs as interaction in new communities all the time
CHD01	31	226.	and then when you get into a new community, you're gonna start as a peripheral learner.	Start as peripheral learner
CHD01	31	227.	and as time passes at some point you're going to be a full participant.	End result as full participant
CHD01	31	228.	but then you're going to face a new community of learning, community of practice, and this kind of getting involved in a new community happens simultaneously,	Involvement in multiple communities at once
CHD01	31	229.	and you are in the middle of different communities of practice right now which keep evolving.	Communities always evolving
CHD01	31	230.	and then I think that very basic nature and idea of communities of practice itself is just a key element of online communities.	Sees this as key to online communities
CHD01	*32*	231.	*c; ok. how do online communities then facilitate a person's role within this particular community of practice.*	

Comment [CHD10]: What how? In what way?

ID	Q#	Turn #	Data	Notes
CHD01	32	232.	L: well, that's a research question that we are working on right now, but...	Doing research to address
CHD01	32	233.	and we need to find out how we can facilitate as a online community designer. I need to find out how I can facilitate those ideas into the online community environment.	Trying to facilitate CoPs ideas in online comms
CHD01	32	234.	one of the things I've been thinking about is the, just giving them proper environment for collaboration, so that they can keep constructing a community of practice.	Need for collaboration in comm. And online is way to do that.
CHD01	32	235.	and while giving them appropriate resources every step of their learning.	Provide resources
CHD01	32	236.	And then, that's the two things that I've been thinking about. other than that you'll have to wait until we get the results.	Waiting for research to make more decisions
CHD01	*33*	237.	*c: ok. what kind of participants are there in online communities of practice?*	
CHD01	33	238.	l: it depends on the goal of online communities.	Participants are different depending on goal of comm
CHD01	*33*	239.	*c: I mean is everyone at the same level of learning?*	
CHD01	33	240.	L: no, no. um, we do not identify certain levels or knowledge of the participants as long as they are belong to a gigantic groups of teaching professionals, we welcome everybody.	All "levels" of learners are welcome
CHD01	*33*	241.	*c: ok, so it's the practice that unites them, not the stage of practice.*	
CHD01	33	242.	l: no.	

Comment [CHD11]: Scaffolding?

ID	Q#	Turn #	Data	Notes
CHD01	*34*	243.	*C: ok. good. ok. well.... I'm not sure that I really have anything else. um. alright, we'll try this one. you said that it's the community of teaching professionals that is the community that you build and online community of practice around.*	
CHD01	34	244.	L: yes.	
CHD01	*35*	245.	*C: what do you believe is...or do you believe that the community has...let me think about how to phrase this, because I don't want to lead you anywhere.*	
CHD01	35	246.	l: <laughs>	
CHD01	*35*	247.	*C: um. why can't an individual teacher go on the internet and find whatever information about teaching she wants without...*	
CHD01	35	248.	l: getting involved in the community?	
CHD01	*35*	249.	*c: right. what is it that getting involved in the community is gonna do to help her be better other than her just exploring on her own?*	
CHD01	35	250.	L: gotcha. um, that was a research question that we explored in our last study. that teachers actually are able to find anything they want through just internet browser. just put the keyword in the Google and get hundreds of research.	Teachers don't need community for straight information.
CHD01	35	251.	and then they are pretty accustomed with all the new internet environment.. they have no trouble with any online resources at all.	Teacher facility with internet technology
CHD01	35	252.	however when we asked about when...whether online resources are helpful for your professional tasks or teaching practices, they say yes, we don't have any problem.	Teachers able to get to resources
CHD01	35	253.	but when we ask do you ever use this for your emotional and personal support. and they said no. and emotional and personal help was the most help they really needed especially for the groups of beginning teachers.	Don't use for social support, but hat is one of the intents

ID	Q#	Turn #	Data	Notes
CHD01	35	254.	they got frustrated everyday. doubt about themselves. and then, really don't know how to manage the bad behavior and everything.	Reason for need of social support
CHD01	35	255.	and then they are burdened by the new standards and frameworks everyday.	Reasons for need of social support
CHD01	35	256.	and then many of them just teach the very difficult course from the first semester of their teaching profession like the AP class or special ed.	Reason of need for social support
CHD01	35	257.	so knowing that they have a lot of problems in the emotional and personal dimension, we think that online community might provide such support while they are getting resources they want for their professional task or teaching practice.	Reason for designing online as form of social support
CHD01	*36*	258.	*c: ok. so do you think that kind of community support is essential to their...*	
CHD01	36	259.	l: well, if they keep dropping out, like 40% of beginning teachers are dropping...beginning teacher attrition rate right now is calculated up to 40%. they are dropping out within 3 years of their teaching profession.	Statistical reason for need of social support
CHD01	36	260.	and they indicated they are struggling emotionally.	Teachers indications of need for social support
CHD01	36	261.	I think they do need help, and that's not the kind of help they can get just by using online resources.	Personal perceptions of need for social support
CHD01	*37*	262.	*c: ok. let me see if I can get back to the beliefs thing. I think we've probably covered it pretty well, but I want to make sure that we've covered it. it's interesting to sit here and have a conversation, and I think I'm soaking it all in, but I know I'm gonna go back and listen to this and go, oh, I should have followed up on that.*	
CHD01	37	263.	l: <laughs>	
CHD01	*37*	264.	*c: um. and that's the joy of this kind of thing, I can always follow up after the class, but like you say, you're a different person when we finish that class than you are right now at this moment.*	

Comment [CHD12]: Only sees social/emotional issues outside of context of actual content learning.

ID	Q#	Turn #	Data	Notes
CHD01	37	265.	l: that's right. <laughs>	
CHD01	*37*	266.	*c: but, um. alright, so, our beliefs inform how we act.*	
CHD01	37	267.	l: that's right.	
CHD01	*37*	268.	*c: I believe. that's my belief about beliefs. <laughs>*	
CHD01	37	269.	l: I believe so.	
CHD01	*37*	270.	*c: so, um, the ahhh..... the research being about epistemological beliefs. are you comfortable with the term epistemology? and epistemological beliefs?*	
CHD01	37	271.	l: <nods head>	
CHD01	*37*	272.	*c: um. I think that, um, I'm rambling now and I really don't know where I'm going, really.*	
CHD01	37	273.	l: it's ok. you're doing great. <laughs>	
CHD01	*37*	274.	*c: thank you. I may transcribe this one after all, 'cause I sound like a bumbling idiot.*	
CHD01	*37*	275.	*c: epistemology to me is the nature of knowledge. and how it is that we know what we new. would you agree with that?*	
CHD01	37	276.	l: yes, uh huh.	Confirms understanding of epistemology

ID	Q#	Turn #	Data	Notes
CHD01	*37*	277.	*c: and I'm, I really just don't know where to go with that without leading you. without just trying to, blah, get my thoughts out on tape here. and I don't need to do that. um. let me see. let me look at my notes. <long pause> you know what? I think we're done. I think we've really...thinking, looking over my question and the main things I need to hit on...*	
CHD01	37	278.	l: yea! <laughs>	
CHD01	*38*	279.	*c: yeah. is there anything...I always like to give a last word. if there's anything that kind of sparked your thinking.*	
CHD01	38	280.	l: no. I can't think of anything.	
CHD01	*39*	281.	*c: ok. what do you. I know you said you want to learn more about situated learning, that why you're going to the class. is there anything that will happened that you'll know that the trip was worth it, that.... is there anything in that class you're looking to happen to let you know that it's helped change you?*	
CHD01	39	282.	l: well, um, having conversations with two previous students in the class....including someone...	Existing knowledge of whale class
CHD01	*39*	283.	*c: including me, that's ok. it's well documented.*	
CHD01	39	284.	l: ok, including you and Denise. I think I pretty much know what's going to happen during the class. however, and then I've been reading the articles and the even the textbook of the class before	Knowledge of class from past students and texts
CHD01	39	285.	and then so I used to think would it be really worth for me to spend this much money? you know I don't have air conditioning in my car...<laughs>...I really could have used this money....in Georgia.	Reason to not take class – money
CHD01	39	286.	anyway, but then until 3 weeks ago I was in one workshop, are you familiar with CFG coaches training?	Past situated learning experience

Comment [CHD13]: Is this a disorienting dilemma?

ID	*Q#*	*Turn #*	*Data*	*Notes*
CHD01	*39*	287.	*c: <shakes head> uh uh.*	
CHD01	39	288.	l: ok. there is a workshop like that.	
CHD01	*39*	289.	*c: critical friends group!*	
CHD01	39	290.	l: yesss! and then, so I was in the critical friends group for a bout a week from 8-5 pm	
CHD01	39	291.	and then before going there I thought, you know, I've been developing online protocol for CFG for about 2 years. I think I know what the protocols are. I think I know all the process of protocols by heart. wh- wh- wh- what is the point of spending a whole week in that workshop.	Doesn't see need for CFG training at first
CHD01	39	292.	And then after the workshop I realized that I'm sort of becoming a new person. I have a lot a deeper understanding about the whole CFG protocol and the meaning of it, and the participants and their needs. and why this is so essential. how this can be all applied to a different situation.	Sees change in her understanding of CFG because of personal experience
CHD01	39	293.	and then I thought, how did I do all the things without getting training so far?	Sees implication for practice
CHD01	39	294.	and then, so it was really an eye opening experience for me.	Personal reflection on CFG
CHD01	39	295.	and then I, so I'm hoping, or I'm thinking this whale watching trip might be something like that as well. that although I think I know all the grounded idea and the concepts of it, being in there and experience it, might give me a totally different idea.	Hopes for whale class to be similar to CFG
CHD01	39	296.	so I'm looking forward to it.	Excitement about class
CHD01	*40*	297.	*c: so experience in the situation is what's...*	

Comment [CHD14]: Renegotiation

ID	Q#	Turn #	Data	Notes
CHD01	40	298.	l: exactly. during the CFG training I get to meet all the real teachers who will use the CFG. and the way they take it. and the way they feel about all the CFG.	Describes situatedness of CFG
CHD01	40	299.	and then we get to communicate with each other from morning to...and we were even recommended to have lunch together...recommended to have snack time together...	Describes CFG experience
CHD01	40	300.	and then, being friends with them. it was really something.	Personal meaning and feelings attached to CFG
CHD01	40	301.	and then, Sean and I, he's another bridge person, we all both went through this training this time,	Social network in place with Sean
CHD01	40	302.	and by the end of our training we thought we can't believe we've been doing this thing in this way for the last 3 years.	Reflection on new understanding
CHD01	40	303.	and then I came back and I told my advisor, that thank you for sending me to that training.	Appreciation for CFG opportunity
CHD01	40	304.	and then I feel much, I feel so different about all this training.	Change in perception
CHD01	40	305.	and this whale watching could be something like that.	Hopes for similar exp in whale class
CHD01	*41*	306.	*c: good. well that's what I'm gonna be looking for the whole week.*	
CHD01	41	307.	l: well didn't you get through already once?	
CHD01	*41*	308.	*c: what for the class? yes, I was a student in the class. but now I'm doing my dissertation on it I will be looking for that change in you. so I'll just be watching the whole time. participant observation the whole time. particularly focusing on the morning classes and the afternoon reflections. I'm hoping to see that this class helps change your beliefs. because I'm a big believer in what you say that I'm not the same person that I was that when we started this interview. And I believe that this class will change all of us.*	

Comment [CHD15]: Another stage of tranformation

ID	Q#	Turn #	Data	Notes
CHD01	41	309.	l: I think so.	
CHD01	*41*	310.	*c: and so I'm looking to try and document that change as it happens as best I can. so it's going to be interesting and we'll talk again after the class.*	