

NEGOTIATING THE MENTOR PROTÉGÉ RELATIONSHIP: WHAT CAN BE  
LEARNED FROM THE EXPERIENCE?

by

LESLIE KAYE UPSON

(Under the Direction of Thomas R. Koballa, Jr.)

ABSTRACT

This study explored the relationship of two mentor-protégé pairs within the internship component of an alternative certification program in secondary science. I collected data using interviews and participant observations during one school year. Four research questions guided the study: 1) What is the nature of the advice given by a science mentor? 2) What do the mentor and protégé each gain from the relationship? 3) What are the tensions that arise in the relationship and how do the mentor and protégé negotiate them? 4) How does the relationship change over the period of the study?

Using the frameworks of narrative analysis and analysis of narratives, I analyzed the data and developed cases detailing the experiences of each pair. These cases were then compared for similarities and differences with respect to the participants' experiences.

Themes present included advice given by both mentors within the domains of general pedagogical knowledge and pedagogical content knowledge. Both protégés believed they had expanded their views of science teaching. Tensions for both mentors and protégés centered on the themes of expectations versus realities, approaches to

teaching, and lack of communication. Three of the four participants experienced a similar cycle in their feelings about their relationships which began with optimism, followed by increasing levels of tensions. One pair was able to resolve their tension and end the relationship on a positive note, the other pair was not.

The findings of the relationship highlight the need for changes to mentor training programs and the development of authentic cases to be used with mentors and protégés.

**INDEX WORDS:** Alternative Certification, Narrative, Mentor-Protégé Relationships, Science Teacher Education, Pedagogical Content Knowledge, Tension, Advice, Fieldwork, Internship

## CHAPTER 3

### METHODOLOGY AND PARTICIPANTS

The purpose of this study was to examine relationships between mentors and protégés during the internship component of an alternative certification program. Research focused on relationship development between mentors and protégés, and the evolution of the protégés' knowledge about science teaching which occurred as a result of their interactions. The following research questions guided this study:

- 1) What is the nature of the advice and guidance given by a science teacher mentor?
- 2) What do the mentor and protégé each gain from the relationship?
- 3) What are the tensions that arise in the relationship and how do the mentor and protégé negotiate them?
- 4) How does the relationship change over the period of the study?

The nature of the research questions and theoretical frameworks guiding the study meant that I needed to spend a considerable amount of time with the participants in their schools watching their teaching, as well as their interactions with each other. It was necessary that I talk with all participants frequently about their experiences in the classroom, their developing understandings of teaching practices, and their relationships. For these reasons, I chose to use ethnographic methods for data collection that included interviews, observations, and collection of artifacts (Spradley, 1980).

As I thought about how to represent these data to a larger audience, I felt it was important to use the participants' words as much as feasibly possible to represent their experiences. A

second important consideration was the nature of the research questions. Because the interactions of the participants contained many unfolding stories, it seemed that a narrative approach to representing their experiences was most appropriate. The narratives developed were organized into cases that described the experiences of each mentor-protégé pair over the course of the internship (Merriam, 1998).

In the following paragraphs, I build on the skeleton overview provided thus far to present a more thorough description of the methodological framework, participant selection, methods of data collection, and methods of data analysis and representation. The chapter concludes with a narrative introduction to each of the four participants.

### *Methodological Framework*

The guiding methodological framework for this study is narrative inquiry. According to Clandinin and Connelly (2000, p. 20), “Narrative inquiry is a way of understanding experience. It is a collaboration between researcher and participants, over time, in a place..., in social interaction.” My support for this approach is based on two bodies of literature: that which supports narrative as a way of understanding human experience, and that which advocates narrative as an especially useful format for gaining understanding of the complexities of teachers’ experience and practice.

The seminal work which provides a rationale for narrative ways of understanding human experience is Jerome Bruner’s *Actual Minds, Possible Worlds* (1986). In this book he postulates the existence of two modes of thought, paradigmatic and narrative. He characterizes the paradigmatic mode as logico-scientific, and contrasts this with the narrative mode which “deals in human or human-like intention and action and the vicissitudes and consequences that mark their course” (p. 13). While Bruner indicates that each is equally useful and appropriate

depending on the situation, the two cannot be reduced to each other; they are separate ways of understanding the world. Building on Bruner's foundation, other scholars have argued that humans understand their lives in a storied form, making narrative an appropriate way to explore their experiences (Connelly & Clandinin, 1990; McEwan, 1997; Polkinghorne, 1988, Polkinghorne, 1995).

Narrative research has gained support in the field of education because it is seen as a vehicle to gain insight into teachers' understandings of their work (Cortazzi, 1993). Narrative enables people to preserve richness and detail as they share their experiences with others (Carter, 1993). Elbaz argues that teachers structure their understandings in the form of stories and thus teachers' knowledge is best understood in narrative formats (1991). Sharing similar beliefs, other researchers have claimed that personal narratives are the tools that teachers use to make sense of their practical experiences in the classroom and thus, they are the representations that researchers should use to understand those experiences (Connelly & Clandinin, 1990; Gudmundsdottir, 2001). Another argument for using this type of approach for the study of classrooms and teachers is that it redresses two problems associated with previous educational research: the reduction of teaching into discrete variables tested one at a time, ignoring the complexity of teachers' realities, and the model of the deficient teacher contrasted with educational researcher as all-knowing expert (Carter, 1993; Doyle, 1997).

The purpose of this section was to describe the rationale for the use of narrative inquiry as a methodological framework to guide the study. Most important is the tenet that, "Humans are storytelling organisms who, individually and socially lead storied lives. The study of narrative, therefore, is the study of the ways humans experience the world" (Connelly & Clandinin, 1990, p. 2). From this outline of the foundation of the methodology of the study, the

following sections provide a detailed description of the procedures used. The account begins with the selection of the participants.

### *Selection of Participants*

Participants for the study included two interns completing an alternative certification program in secondary science, and their mentor teachers. Using available literature pertaining to alternative certification programs, along with a wealth of experience in science teacher education, the department of science education at the University of Georgia designed its own alternative certification program for secondary science teaching.

The program, called the Program for Alternative Certification in Secondary Science (PACSS), is designed to allow people who have a science background and wish to enter the teaching profession an opportunity to do so while remaining employed. PACSS provides an option for people with at least an undergraduate degree in science, or a related field, to become certified to teach in grades seven through twelve in one of the following science disciplines: biology, chemistry, earth science, or physics.

One strong component of the program is a field-based experience with the support of a mentor teacher. Participants complete the field work component of the program by choosing one of two routes. They may teach in a public or private middle or high school on a provisional certificate, or they may choose to intern for at least twenty hours a week in the classroom of a mentor teacher. When people choose the internship option, they are required to spend two semesters in that classroom. Program participants receive 12 hours of course credit for their field-based experiences.

In addition to the fieldwork experience, participants complete 18 additional hours of course work. Courses include: Methods of Science Teaching, Science Curriculum and Learning

Theory, Philosophy and Leadership in Science Classroom Practice, and Technological Capabilities for Science Teaching. A course in educational psychology and a course in special education are required as well.

The two protégé participants chosen for this study were not teaching provisionally; they selected the internship route. They were chosen based on the belief that in situations where interns were required to spend all of their time in the classroom of another teacher, the mentor would have greater influence than those mentors of provisional teachers who may have less time for work with a protégé. I wished to explore these types of close mentoring relationships.

From the total number of PACSS interns, I used several criteria to narrow the field of possible participants. Because my own teaching experience was in a high school setting, I chose interns placed in a secondary, rather than middle school situation. During the year that data collection took place, I served as a university supervisor for participants in the PACSS program. To avoid feelings of pressure on the part of participants, I chose not to work with any interns for whom I was the university supervisor. A final criterion used in selection was the experience of the mentors with whom interns were placed. I felt it was important that mentors who participated in the study have experience and training as mentors. I worked with the director of the program, who had a history of working with science teachers in the area, to determine which mentors had completed mentor training and had had positive experiences working with protégés in the past. Interns working in high school settings with experienced mentor teachers formed my short list of possible participants. This type of selection, in which the researcher chooses participants based on the recommendation of experts familiar with the population to be studied, is known as reputational case selection (LeCompte & Priessle, 1993). Using the selection criteria, a list of two possible protégé participants was generated. The selected interns were

approached on the first night of their fall semester methods class with a brief description of the project, and both agreed to participate in the study. Their assigned mentors were contacted and both indicated their willingness to cooperate. Once participant selection was completed, data collection began.

### *Data Collection*

Interviews and observations conducted between August 2002 and April 2003 were the primary sources of data for the study. Secondary data sources included lesson plans, copies of class activities, notes given by the mentor to the protégé, and emails sent from participants to me. I kept a research journal where I described reactions to particular interviews, possible interview questions, and emerging understandings of the data. These secondary sources played a lesser role in data analysis though the notes from mentors to protégés and emails from participants to me were influential to my thinking. This section on data collection begins with a timeline for collection followed by a more thorough description of each of the data sources and how they were developed and enacted.

*Timeline.* Data collection began in the fall of 2002. I interviewed each participant before the start of the internship to gain an understanding of their science and teaching backgrounds, views of science teaching, and expectations for the relationship. These interviews occurred in late August and early September. Appendix A contains the protocol for these interviews. Because of complications with paperwork in the student teaching placement office, the protégés did not begin their internship placements until late September. In the interim between the first interviews and internship placement, I used data collected in the initial interviews to construct first person narrative descriptions of each participant. These were shared with each participant in interviews once the internships began to give participants an opportunity to comment on whether

the narratives captured the ideas they expressed in the first interviews, and to allow for clarification if participants felt it was needed.

Once the internships began, I visited each pair on an approximately weekly basis. Appendix B contains a detailed log of the times and dates for school visits. During these trips I observed one to two class periods and interviewed each of the participants separately. Over the course of the study, I tried to visit different class periods to get a sense of how they varied. I purposefully visited more frequently during each pairs' planning period to see the conversations about planning and teaching that occurred during those times. Over the course of the year, I interviewed each participant approximately 15 times and made approximately 15 observations of each pair. I attempted to visit each pair on a weekly basis, though scheduling conflicts and school holidays necessitated flexibility in arranging visits.

The heaviest periods of data collection occurred between October and early March. At that point, the relationships did not seem to change a great deal and conversations in interviews began to repeat themselves. I felt I was not gaining new insights based on my observations. I felt that saturation of the data had occurred (Bogdan & Biklen, 1998). I did return to the sites at the end of April, near the completion of the internships, for one concluding interview during which participants reflected on their overall experiences with their mentoring relationships and reviewed narratives that had been constructed.

The timeline provided in the previous section explains the general pattern of interactions with participants. The following sections on interviews and observations provide a more detailed description of the primary methods used for data collection.

*Interviews.* Frequent interviews with the four participants supplied much of the data for this study. As previously stated, one of the principles guiding my research was an attempt to

incorporate the participants' voices into the study. As Weiss (1994, p.1) aptly stated, "We can learn..., through interviewing, about people's interior experiences. We can learn what people perceived and how they interpreted their perceptions. We can learn how events affected their thoughts and feelings." This passage summarizes my goals for the interviews I conducted. Because I could not be present on a daily basis for all interactions between mentor and protégé, I relied on participants to tell me about the most salient experiences in their relationships and how they interpreted those.

Interviews were semi-structured in nature, but grew more conversational as the study progressed. They ranged in length from 20 minutes to an hour depending on time constraints and participant responsiveness. I made verbatim transcripts of each interview before my return visits to the schools in order to become familiar with the data and to determine what questions would be asked the following week. As I transcribed, I recorded possible questions for the next visit in my research journal. In cases where I could not get the transcription done quickly enough, I listened to the tape of each interview to determine the interview guide for the next week. Two sample interview protocols can be found in Appendix C.

The first question typically asked of participants during each interview was, "Tell me about what you've been doing this week." This approach allowed participants to speak freely about topics pertaining to the relationship that they felt were important. Subsequent questions were based on follow-ups from the previous week's interviews, probes based on the observation that day, or probes based on participant responses to the initial interview question.

As the study progressed, interviews were used for member checking (Bogdan & Biklen, 1998). As I constructed data charts where sections of interviews were grouped based on their relationship to the research questions, I shared these charts with participants and asked if they

thought my choice of interview excerpts and groupings were appropriate. Later in the study once narratives were developed, I showed them to participants and asked for their feedback. I wanted to ascertain whether the narratives that I constructed based on my interpretations of their experiences meshed with their own understandings.

While interviews were an important avenue of data collection for the study, observations of participants' interactions provided a second crucial source. In many ways, the observations and interviews informed each other. Methods used in observation are described in the following section.

*Participant Observation.* Dewalt and Dewalt (2002, p. 2) describe participant observation as a “way to collect data in naturalistic settings.” Using this method, they continue, the researcher can “observe and/or take part in the common...activities of the people being studied.” This describes my purpose in observing the classroom teaching and planning periods of the two pairs of participants in the study. It was important for me to see how the mentors and protégés interacted with each other in the context of their classroom setting as they carried out their daily routines. Participant observation can involve a range of possible levels of involvement on the part of the researcher. Using the categories outlined by Spradley (1980), I describe my level of participation in the site as moderate. I did not actively teach or plan with the participants, however, I was not an outsider who just observed. I engaged in conversation with them during the observations, sometimes ate lunch with them, and when asked, interjected ideas for lessons or strategies I had seen other teachers enact in similar situations.

As I observed the participants in action, I took detailed notes of what I saw in my field notebook and procured copies of notes and hand-outs for activities undertaken during my visit. Because it is impossible to capture everything that is happening in a classroom at any given time,

I needed a focus for my observations. I chose to channel my attention on what each member of the pair was doing during the class periods and the interactions between them, rather than the activities of the students. In observations of planning periods, the focus was again the interactions between mentor and protégé where I attempted to capture as many verbatim quotations as possible. In addition, I made notes of questions that I wanted to ask in the interviews based on what I had seen during the observation. As soon as was feasibly possible after leaving the sites, I entered my scratch notes into a word processor program and expanded my fieldnotes adding details that I could remember, but could not write fast enough to capture (Sanjek, 1990).

In a few cases, both pairs were doing something that I wanted to see at the same time, and it was impossible for me to be in both places. In these instances, I gave one pair an extra tape recorder and asked them to record specific conversations. Verbatim transcripts were made of these tapes.

Transcripts of interviews and fieldnotes from observations were the primary sources of data for the study. Interview questions for each week emerged based on classroom observations and striking comments made in previous interviews. The following section explains how this data was translated into the narratives that were the product of the study.

### *Data Analysis*

The accumulation of data collected in 60 interviews and 30 observations resulted in 260 pages of data for one pair and 374 pages for the other. This archive of data had to be transformed into a narrative representation of the experiences of these participants that would not overwhelm readers. This transformation of the data was a multi-step process that occurred throughout the

course of the study. The three major steps in the process were analysis of narratives, narrative analysis, and cross-case analysis (Merriam, 1998; Polkinghorne, 1995).

*Analysis of narratives.* Polkinghorne (1995) describes analysis of narratives as a paradigmatic way of understanding human experience. In his view, when the researcher undertakes this process she, “seeks to locate common themes or conceptual manifestations among the stories collected as data” (p. 13). Though Polkinghorne does not provide explicit instructions for how to do this, the idea formed the basis for my own version of the process.

For me the process began with a reading and rereading of the interview transcripts and fieldnotes once they were entered into the computer. Systematic coding of the data started at the Christmas holiday. In the first iteration of coding, I read the interview transcripts and used highlighters to color code sections of data based on which of the four interview questions was addressed by a particular section of data. These sections were in essence short stories told by participants that addressed one of the research questions. They ranged in length from four to five lines up to 20-30 lines. Once the highlighting was complete, I used a word processing program to copy and paste the data into charts for each pair, for each research question. In other words, each pair of participants had their own chart for each research question. Each chart was divided into three columns: one to identify the source of the quotation, one to house the quotation, and one to allow a place for notes and codes. A sample of one page of one data chart is found in Appendix D. The construction of these charts was an ongoing process that lasted from December through the end of data collection.

As I constructed the charts, a second more specific round of coding began. Codes can be thought of as labels or units of meaning attached to sections of data collected during a study

(Miles & Huberman, 1994). As I looked at the stories included in my charts, I assigned a word or words to them to capture the gist of each story.

Once this process was complete, I continued with analysis research question-by-research question for each pair using an inductive process. One chart at a time, I used scissors to cut the stories apart and stack them into groups that shared some common element. As the process was completed, I reread all of the stories in each stack and determined the thread that connected the snippets in a particular group together (Coffey & Atkinson, 1996). These I labeled as the themes present in the data. Themes present for each pair are summarized in Appendix E.

This process of coding stories and grouping them into themes facilitated the second major area of analysis in my work, narrative analysis. Themes constructed through the analysis of narrative process provided the framework that determined which narratives I constructed, and how I organized them.

*Narrative analysis.* The process of narrative analysis involves synthesizing the data “into a coherent developmental account” that represents the experiences of the participants (Polkinghorne, 1995, p.15). This type of analysis aligns with Bruner’s (1986) narrative way of knowing. I combined the smaller stories, generated during the analysis of narratives, into longer accounts using the research questions and themes to provide the organizing structure.

I planned to organize the data around the specific research questions. I also wanted to present each pair as their own unique case. In thinking about how to structure the narratives within that framework, I decided that it was important that each participant’s voice be heard presenting their own version of the story for the questions pertaining to tensions, gains, and change. For each of these three research questions, a separate set of narratives was generated for each mentor and each protégé, though the narratives for each pair were included in the same

chapter. This separation of voices was particularly necessary because in some instances, the perception of the mentor and protégé about the same event was very different. In the case of the advice question, mentors and protégés shared similar perspectives so it seemed more appropriate to generate only one narrative for each pair relating to this question. However, the contribution of each participant is clearly labeled with their name.

To construct the narratives, I worked on the themes for one question, for one pair at one time. For instance, a theme for one protégé's tension narrative was "roles and responsibilities of a science teacher." I organized all of the pieces of data related to this theme, for this participant, in chronological order, and then compiled them into a coherent narrative using the participants words. In some instances, I had to add words for readability because spoken language is so different than written. In these instances, I indicated my words in brackets. All other words are directly from participants, though I chose the order of the sentences. One example of the transformation from raw data into finished narrative is included in Appendix F. In each instance, I kept all of the bits of data included in the narrative as well as the stories that were omitted. I used the same technique, until all of the themes and questions had been addressed for each pair.

I found the participants' experiences with the tensions in their relationship to be the most fascinating. I also felt that question was the one where I was most likely to misinterpret the perceptions of the participants. For this reason, I worked to make sure those were constructed for each participant while I still visited the site frequently. I shared each participant's own tension narrative with them during an interview. For the other three questions, I emailed the narratives to each participant once they were completed and asked for feedback. After the final interview, I added to each narrative based on the overall reflections of the participants.

Once I completed this analytic work, I shared the finished product with two members of my committee. Both agreed that the chapters were too long and I had included too many narratives to support the various themes. They requested that I return to the chapters and choose one or two narratives to provide support for each theme. This resulted in an omission of approximately one third of the narratives generated for each pair. The choice of which narratives to omit was based on repetitiveness. In cases where several narratives illustrated the same theme, I left one or two examples and omitted the others.

The final form of data analysis involved comparing the themes generated for each of the two pairs to determine similarities and differences between the experiences of each. A brief description of this process is included in the following section.

*Cross-case analysis.* The final step in analyzing the findings of the study was a comparison across the cases of the two pairs in an effort to find patterns common to the experiences of both (Merriam, 1998; Miles & Huberman, 1994). The first step in this comparison was to re-read the cases generated for each pair, and consult the detailed outlines made for each chapter. The research questions provided the framework for the comparison. In each case, for each research question, I looked for similar experiences for the protégés and the mentors. I also looked for instances where experiences of the two pair differed. In instances where I found commonalities, I tied these to related education literature.

As I designed and carried out the study, I attempted to incorporate strategies to improve the trustworthiness of my work. A description of these techniques is included in the following section.

*Trustworthiness of the Study*

The goal of any qualitative researcher is to convince an audience that the findings of the study can be trusted and are worthy of attention (Lincoln & Guba, 1985). Wolcott (1994) describes this idea as “getting it right” or trying not to “get it all wrong.” There are several ways that I have tried to achieve this criteria through the design, data collection, and data analysis of this study.

There are certain strategies associated with trustworthiness, that I see as almost taken-for-granted aspects of quality research. These include such things as tape recording all interviews and making verbatim transcripts; expanding fieldnotes as quickly as possible following a site visit; conducting interviews in which the participants, not the researcher is doing the majority of the talking; and collecting multiple types of data to provide the opportunity for triangulation. I employed all of these approaches in this study. Trustworthiness, however, means more than the mechanical aspects of the study.

One primary way I tried to achieve trustworthiness was by the length of time I spent in the site. Over the course of the school year, I made many visits to the site and conducted lots of interviews. I think that in some ways, the participants came to see me as an “insider.” I knew what was happening in their classes and relationship, and was a regular. Their interactions with me became a routine part of their normal activities. Though I would not say that I achieved a truly emic status in either relationship, the high level of familiarity contributed to the richness of the data I was able to obtain.

A second technique I used was member checking. I wanted to share my developing understandings with participants. Clandinin and Connelly advocate a certain kind of member checking in narrative research (2000). Rather than just asking the participant, “Is this what you said,” researchers ask “something more global and human: Is this you? Do you see yourself

here? Is this the character you want to be when this is read by others?” (p. 148). By returning to participants with portraits and narratives constructed using their words, I attempted to give them a voice in how they were portrayed.

One final aspect that must be considered when addressing the trustworthiness of the study is the subjectivities that the researcher brings to the work. My own subjectivities surrounding this work are detailed in the following section.

*Subjectivities.* A description of my own experiences with mentoring is important in outlining my subjectivities related to this study. As a high school teacher, I had a mentor of my own. This was a woman with a personality very different from my own who I feared in many ways. I appreciated the fact that she wanted to help me, but did not feel that we had the personal connection described in many studies about mentoring. It was not a bad relationship, but it also was not one that contributed to my understandings of science teaching. I also had experience working with the science mentor training program in my own department. I had conducted small scale studies where I visited people who had completed our program and asked about their experiences. In each case, I received glowing reports about the relationships. And yet, I knew from my own experience that these relationships were not always easy. I went into the study determined to get to the bottom of “what was really happening” in these relationships.

As the study progressed, I encountered a second subjectivity that must be discussed. Because I spent so much time with the participants, I developed close relationships with most of them. I deeply appreciate the amount of time and energy they have devoted to helping me with this work. For that reason, I feel very protective of how they are portrayed to outsiders. As people read these narratives, I think it is very easy to criticize certain aspects of some of the behaviors. My thoughts about the balance between responsibility to my participants and

accuracy in representing their experiences could not help but influence the choice of narratives to include.

### Introduction to the Participants

Up to this point in the study, the participants have been described in abstract terms such as mentors, or participants in an alternative certification program. Details have been given about how they were selected, how interviews and observations were conducted, and how narratives were constructed, but we do not know them as individuals. The purpose of the introductions that follow is to let the reader get a glimpse of who these people are as science teachers and their views on the subject of mentoring before the study began. We can now attach names and ideas to previously anonymous participants. These narratives can serve as a reference point for participants initial beliefs; they are informative for understanding the experiences that follow in subsequent chapters. First are the descriptions for one pair of participants, Melanie and Patti, followed by portraits of the second pair, Kevin and Jodi. All names are pseudonyms.

#### *Melanie*

Melanie is a veteran science teacher with five years of science teaching experience at the high school level. She works in a school with approximately 600 students located on the outskirts of a large metropolitan area. In the past, Melanie has served as a cheerleading coach at her school and has won teacher of the year honors. This experience was Melanie's second serving as a mentor for a science teacher intern, though she has mentored several new teachers at her school. On a typical afternoon in Melanie's room, students stop by to say hello, complete make-up work, or to get help on topics they did not understand from the day's lesson. During the period of the study, Melanie served as a mentor to Patti. In the following sections, Melanie explains her views on science teaching and mentoring. All words in italics except for those

enclosed in brackets are Melanie's. Bracketed words were changed or added by the researcher. This stylistic convention is used throughout the rest of the dissertation.

*Views of science teaching. [My name is Melanie and] this is my sixth year. I think a good science teacher, [or] a good teacher of any subject, has a lot of balance- uses a lot of different methods, all the time, every single day, for every learner: kinesthetic, auditory, visual. I think it's good for them to be able to touch things and do as much as possible. Even if you're having to spend some time lecturing or teaching them about [a topic], it's really good to have something that they have at their desk that they're doing along with you, or that you can pass around. I just think it's really good to teach to all learning styles. And I think great science teachers are the ones that can get kids to figure out things [in] more of an inquiry [way] on their own-[shouldn't] necessarily [say], "This is the way it is, please take my word for it. "I'm the ultimate authority." You want them to be the kind of thinkers that start to come to realizations on their own. They just remember it longer, it makes total sense when they're doing it and they don't just have to take your word for it. I don't think we want to put people out into society that just take people's word for everything. We want people to be able to think for themselves. You have to continually hold them accountable for what they're doing, and give them challenging problems that make them really think about whatever lesson you're teaching them A good science teacher is extremely enthusiastic about what he or she is doing.*

*Reasons to be a mentor. I think [being a mentor] is very important. I think it's probably one of the most important things I could do. It's something I have the least amount of time for, but in the grand scheme of what I stand for in education and what I think other people should stand for, how can you not agree to try to help somebody stay*

*[in teaching]? Once they've been mentored, they will stay in that field- they have a chance of staying in the field much longer than they would if they didn't have anybody to help them through their first year or two. I know that when I first started teaching, I didn't really have anybody to do that for me, and the only reason I probably stayed in teaching was because my mom was a principal. I could ask her a lot of questions. She would help me through some situations. I can remember not having an actual mentor assigned from the school, but seeking help from different places where I knew I could get it. But if I had had somebody whose room was right beside me, that taught the same thing I did, it would have been a lot easier on me. It was a good year and it was a great school, but I think it would have been better if I'd had a mentor. That was a big reason that I wanted to help do this.*

*[Once] I got more into [mentoring], I saw the statistics of how many teachers drop out of the profession if they're not helped through those first few years. I was amazed at the numbers-like 80% within 10 years leave if they don't have somebody helping them. I couldn't believe it, but I can see it. There've [sic] been plenty of days that I thought I'm just not gonna come back next year; this is not worth it, but you get over it. I have warm feelings about [mentoring]. I feel like it's very important and it's very, very hard to do.*

*I think [being a mentor] helps me reflect on my own teaching. It's a selfish benefit, but when you're trying to help somebody understand something, [it makes you think about what you're doing]. When you're asking other people to hold themselves accountable to a certain standard, you have to hold yourself to that same standard and it pushes you to be a better teacher I think. I like the communication and the camaraderie*

*with the university. I like to keep that door open. But, I get a lot of personal benefits as far as my own teaching, that's really important to me.*

*Role of the mentor. I think my job is to get [the protégé] to a place where they are completely competent on their own, where they feel comfortable answering questions about content, where they feel comfortable with their own knowledge. [I want them to] feel so good about what they're doing that they don't have to use the book labs, or the book homework sheets. They need to go for it, because that's where a lot of real teaching takes place. I really would like to get them to that point. Of course, in the beginning everybody's just so overwhelmed that it's good to depend on the materials that are given to you as far as the stuff that comes out of the book. The most important thing is that they learn how to elicit excitement from their students [for] what they're doing. Of course, students are going to love it if you teach to all learning styles and if you're constantly giving them something to figure out. It's a big job and there's no one way to do it.*

*I'm a big organization freak. I really want my [protégé] to learn how to be organized and how to be completely efficient. Efficiency is the key; a good teacher has a great system and knows where everything is at all times. Like today, in biology we were doing water and polarity and hydrogen bonding. To me, I should have a little folder with a slew of stuff in there that I could do, or show, or talk about.*

*I think professionalism is defined by how you act with other people and the kids. I want [the protégé] to get to a point where they know how to interact with other professionals. Adults get snippy with each other sometimes and you have to be able to let everything roll off your back. They should know how to interact with students on a very professional basis and know how to elicit not only good behavior in class, [but also] a*

*real desire to learn. Teaching is hard on your ego, the kids don't hesitate to tell you anything- how your hair looks or what you're wearing. You can't just say whatever comes to mind. People think that if you make smart comments to the kids, they'll [think] you're cool. But they really respect the teachers that are completely professional. They won't admit it, but they do. They try harder on their homework and everything that you ask them to do. [You can] never let your guard down and never let them see where your buttons are. Sometimes they'll say things just to see if it would bother you, but I never let it look like anything is bothering me because they just won't do it anymore if they don't get any kind of response.*

*Sometimes high school students love you too much. They'll try to get too friendly and you have to be adult enough to [draw the line]. [They want to] talk about other teachers, and you can't let them.*

*Role of the protégé. I think the [protégé's] job is to come in and learn as much as possible. It's sort of a balance. They need to come in and learn as much as they can from the [mentor] and then learn how to develop their own ideas. I think that they're there to figure out what constitutes good and bad teaching and how [they can] start to develop [their] own personal [style], because everybody's different. The way that I see good teaching is slightly different from the way they're going to see it and they need to develop their own idea, their own personality with the kids. They can't copy mine. I certainly don't think that they're there to learn how to copy from me. I just need to help them find themselves. [They should ask themselves], "How do I get the student to learn as much as possible and really enjoy it?" They need to learn all the students and how they react in different situations.*

*If you get right down to it- initial responsibilities, I think they should come in and start observing and taking some notes and maybe trying to figure out what constitutes good teaching. And then later on, I think it's good for them to start developing some short lessons, and start teaching those and get to know the students real well. I certainly don't think that they're there [to be my secretary], I would never hand anybody a stack of paper's to grade. To me, they're in there to learn about teaching. They need to maximize that however they can. [They need to figure out] how [what they are seeing] applies to them. Their job is really to learn as much as possible and get absolutely as much experience as they can and try to get a feel of what it would be like were they on their own.*

*It makes it a lot easier if they know the content really well and there [are] no issues on that. At least if they're only a little confused about something, they can clear it up. Of course I will help them, but it really makes it easier if I don't have to reteach anything to them. I really expect them to know what they're talking about.*

*[It's important] to have a good attitude and to really be enthusiastic. I like to see enthusiastic teachers. It's scary at first but you find yourself comfortable with the kids after a while, and you really do need to get excited about what you're doing, because they won't if you don't.*

*They [should] come in with a work ethic and be willing to try new things. I stay at school until five and six o'clock all the time. I [may] know I have a lab that we did last year, but I get bored myself. I have to switch things around. I will sit down and find something new [or] make up something new that gets the exact same concept across. I can't repeat stuff a lot. At first, you just want [to use] what you have, but I think you*

*need to be willing to try new things and to make yourself grow. They also need to make themselves grow. It's hard, but I think it's really the only way to become a better teacher. You have to keep pushing yourself to do new things and if you don't try it and you don't fail at some of the things, then you're never going to know if you could be better. The kids really appreciate it; they like doing stuff that's new and different that you didn't do last year. I have kids coming by all the time- "We didn't do that last year." I [say], "Well, it gets better every year."*

*Possible difficulties involved with being a mentor. I've only had one student teacher prior to this year and I've also had some new teachers that I've helped, so I'm still going to be cutting my teeth on the new student teacher this year. Maybe professionalism is a big deal because I was having a hard time getting it out of my student teacher last year. I'm talking through colored glasses, but I just felt like she was really immature. It was hard for me to tell somebody what their weaknesses were. It's not real hard if you're just talking about a lesson. But talking about what I consider personality weaknesses, where [she was] just immature, was very hard for me last year. She would get her feelings hurt really bad, so it made it even harder. When I would say something and she would get upset, [it was difficult]. I never would criticize but just try to say, "Here's what your strengths are and this is what you did well, but this is what we need to focus on." I just had a hard time doing that and reading her, because she was getting her feelings hurt a lot. I think it was hard at first for me to pick out what she was doing well with the lesson.*

*I know there are some things unconsciously that I may do. [The projector is one side of the room], and [it may turn out that] I'm talking to this side of the room and*

*ignoring [the other] side of the room. So when I would observe her, if she was doing the same thing, I would tell her, but I didn't realize I was doing the same thing. That was hard because I'm sure she thought I was talking out of both sides of my mouth.*

*I think that it's hard sometimes to get [the protégé] to be on her own. I know that her supervisor last year kept telling her [not to rely so heavily on] stuff from the book. We want to see what kind of lab you're coming up with to help them think through this. She just could not get that through her head. She said, "That's what it's there for." And I understood where the supervisor was coming from, wanting her to go out a little bit on her own and try some things. It was hard to get her to do that. What I wish I had done was say, "You're on your own and of course I'm going to help you develop through it. Show it to me ahead of time." Then I could go back and show her [what] probably needed to be changed and why. Then on the back end before she left, let her copy anything I have. [I should have said], "Spend your time and go through it this summer. You can use what you want to, but now you've got your own stuff too." I would have given her anything at the end, but I wish that I had left her a little bit more on her own in that respect. And I will definitely probably do that this year.*

*[This year, she is] a non-traditional student. I'm wondering if she is an adult with a family. I can work with anybody, I really can. But I thought it might be kind of awkward to work with somebody that is a lot older than me who has a family.*

### *Patti*

Patti was a friendly, talkative woman whose age was somewhere in her late thirties to early thirties. She had experience in several health related fields and was eager and excited to start her internship in Melanie's classroom.

*Path into the teaching profession. [My name is Patti and my route into teaching is somewhat] convoluted, I have a degree in respiratory therapy from the Medical College and a minor in life science. After I finished at Medical College, I worked in a hospital for two years and then was in pharmaceutical sales for about seven years. The pharmaceutical company that I worked for downsized, so my territory got consolidated and I looked for something else. [I] worked for a medical waste company for three years, and then a medical staffing company. [Both were] interesting and very entrepreneurial, which I liked. [Then I] helped a friend of mine with marketing and things for his business, but I was ready to do something else and I started looking seriously at going back to school.*

*About a year ago, [there was] all the media hype about [being able to] go to school for a month and then teach. I found out that's not the case, but I was still interested in teaching. I found out about a program at State College called Health Occupations Education. I went to several job fairs and met lots of people, but I found out there's not much demand for that. The only openings I could find were [far from my home]. I really didn't want to drive that far.*

*I found out about this program which was neat. I felt frustrated that it seemed that there were different ways to go about [getting certified]-other than just going to school, majoring in education, getting out, teaching, then getting your Master's- which is what some people do. [I decided to participate in the internship program in PACSS] because I had such a bad experience with the Health Occupations experience that I wasn't sure how that would work, if there would be an opening to teach provisionally in the Fall. I just wanted to get started. The system doesn't work real well as far as people*

*getting in and getting their provisional certificate if they don't have a degree in a science. I really didn't want to be thrown out there, not knowing anything about teaching and sink or swim, and not have a good experience. Everyone's different and maybe it would have worked out, but at the same time I really think that the mentoring will be much more beneficial to me because I can be under someone's guidance and direction. I can be shown the right way to do things and not become frustrated. I will also be getting a wonderful review of biology and I'll have someone to ask questions of, to bounce things off of, to help prepare for the Praxis II. All of those things make it a much better fit for me.*

*Role of the protégé. My job would be to do everything I can to make sure that I'm prepared and make sure that I'm willing to learn, and see how she does things, and see what works well in her situation-to observe and take in all I can to utilize it effectively when I have my own classroom to teach and reach all class members. I have positive expectations. I want to have a good experience and learn and do a good job. I like science, it's interesting. It will all come together.*

*Concerns about mentoring. I don't think [mentoring] would be a problem if it wasn't pharmaceutical sales. In pharmaceutical sales, what is done on a day-to-day basis [by the salespeople] versus what [higher-ups in the company] thought should be done, or how it should be done was very ivory tower, not going to happen. What I'm trying to say is in teaching hopefully, it will be more reality-based. What I expect from my mentor is to really learn how to effectively teach people and reach them, managing a classroom and how evidently from the very first day things need to be laid out-what's expected. Maybe children are even looking for that guidance to feel secure and know*

*what they're supposed to do. It's really important to make sure everything's ready or you can get off into chaos and it's very disruptive. [I hope the experience] helps me learn what happens in a [science class] and how you are supposed to do things, something that will have meaning and real world connotations.*

*I've worked in so many different situations now, I'm not afraid to go to work in new places. I'm really not worried about getting along with my mentor, but I don't want to get disillusioned and not want to teach. I want to have a good experience, but I know it's not going to be perfect. I don't want the kind of experience where people just give up, and they go into a stage where survival is the instinct. I want to help her, I don't want to take too much of her time and be a burden. I want to teach, and I want to be able to do well.*

*Views of Science Teaching. From reading the book and going to class, I think things are completely different from either going to college, or when I went to high school. I may not remember this correctly, but I remember roll call, and notes on the board, and that's not the way you're supposed to teach anymore. I remember some labs and things, but the focus was to read the chapters, have lecture and notes, and then have a test.*

*Now, you don't take roll because one, it's a waste of time, and two, it's an opportunity for them to act up. Now, you have activities that they do on their own or in groups. The whole concept has changed and you have to be real aware of different levels of students and what they're able to do, and you have to keep things changing to keep them interested and involved.*

*[I picture] a nice, organized classroom, not too cluttered, but not bare. I think you should personalize it, if we're doing plants, bring in pictures or leaves that they collect. Maybe have them bring in things and you bring in things. If you were doing Kingdom, Phylum, Class and Species, you could bring in sea shells and different things to get them interested. You don't lecture anymore, but try to make things interesting so that the students think on their own and develop ideas and concepts so they understand the material. You should try to teach it personally in a way that they would understand it and be interested in it.*

*Kevin*

Kevin was a veteran middle and high school teacher with many years of teaching experience. The school where he taught during the project was located outside a large metropolitan area and had over 3000 students. A trip to Kevin's classroom was like a visit to the zoo. In his room were a salt water aquarium with a shark, a terrarium with a tarantula, a second terrarium with a turtle, and a cage with a snake. The back wall of the classroom was lined with aquaria full of fish for an on-going aquaculture project. Students stopped by to help care for the animals and visit with Kevin. Paper mache models of fish and cells hung from the ceiling. Digital camera pictures of overnight student field trips to a coastal marine center covered the cabinets along the wall. Kevin served as Jodi's mentor during the 2002-2003 school year.

*Teaching experience. [My name is Kevin and] this is my eighteenth year. I've taught all my life-swim team coach and swim lessons then in college I was a ski instructor. I was a biology major [and] didn't know what to do after I graduated college. [I went to an] environmental education center, saw I liked teaching, but it didn't pay any money so I went back to the [university], got my teacher's certificate, and have been in*

*[this] county ever since. Middle school for the first seven years, got burned out. Went to the zoo for 4 months and then got into high school. Biology [is] my strong point. I've always been a kid that collects animals and I still collect animals. That's what I like. That's what motivates me [and] keeps me interested.*

*View of science teaching. Several things come to mind. It's something that's gonna engage the students, show them a wow factor, motivating them to learn or ask questions why. If you can plan activities day by day where they can investigate things and learn things on their own, I think you have a good science teacher. Here, we have to cover the mandated curriculum, but we work that in somehow. I've really gone big on inquiry this year. I've gotten rid of the cookbook labs. I'm using the materials from the cookbook labs and just giving them to 'em and tell 'em - figure out how does this apply to what we're learning. I see the teacher as a facilitator, but they're asking questions all the time. [I want the students] actively participating and not sitting there reading the book and answering questions and doing that kind of stuff. We are just doing different things. Now instead of writing a two page report [about a famous scientist], we're in the media center and they are trying to find a real life scientist and they have to make an email connection. If they can do that, then they have to do an email interview, instead of writing a two page paper. Ask them questions that you want to know about.*

*Reasons to be a mentor. I took [a mentor-training] class and we needed to get a protégé. That's pretty much what happened last year. Now that I've got my certificate, I don't want to waste the class that I had. I had a good experience last time. I think [I] learned things- stuff not to do, stuff to do, how to communicate better, how to share things, how to motivate them to put in the paperwork so they can get a job earlier,*

*learning the “tricks of the trade” you want to add. I’ve improved from last year. I want to add that and make it better for the next person. Plus, you have that concern in the back of your head about how we need teachers, especially good science teachers. I guess that’s a selfish reason for the school, if I can find good people mentoring, I want to recommend them to get hired here so we have more people. That’s a secondary thing, but still.*

*Role of the mentor. Primarily, I want to expose them to what is good and bad [teaching], and then secondly, I want to expose them to the job and all the things that go into the job. My primary job is to show them the difference between how teaching could be and how it should be. Meaning, we could give them worksheets. I think anybody could do that. As long as you’re a task manager, you can get out a calendar, write down here’s chapter one, here’s chapter two, here’s chapter three. Let’s do worksheets. Let’s do a lab. Let’s do a quiz. Let’s do a test. Anybody can do that. It’s so much more rewarding if you change that and think of something that makes the kids learn, makes them think, engages the kids where they’re actually learning the curriculum. And I’m big on real-life applications. If I can find a real-life application, let’s do that. Let’s make it fun for everybody in the classroom. I think if I show the protégé that that is the better road to take then I’m making them a better science teacher. [My job is] to expose them to the job, show them we can do it this way. This is easy on you, but you might have a lot more kids struggling, whereas if you do it this way and make it more exciting and fun, you’re going to have [fewer problems]. I think that’s the main thing.*

*I [also] show them what’s required by our county and all of the stuff that goes into [teaching]. I do a whole lot more work as a school teacher than I did as a business*

*person and I don't know if they realize the amount of work that happens-the mandated curriculum we have, and all of the policies, and all of the papers, why we do things, how we do things, and how to get around the building, learn all of the logistics of the daily grind of being in school. [I show them about] keeping track of parents. I'm real pro-active in talking to parents and emailing home and sending home rewards and letters, so they can see that. [They will] also learn a lot of biology just by being exposed to it and exposing the kids to it. [My role is to] be a facilitator, and answer questions, try and help them get a job, give them guidance, expose them to the job and let them get practice doing it. [I also want to] make sure they are not bored. I don't want them just to sit here and think they're [not] valued, because they're here to learn.*

*Role of the protégé. [The protégé's job is] to be a sponge. They really have to absorb it. They have to soak everything in. I'm dealing with 9<sup>th</sup> graders who have good days and bad days every other day of the year. That's my job, I have to go with the punches as far as the students go. [I expect the protégé] to give some effort and talk about things and be inquisitive and ask questions. Why did you do this? What would happen if we did this instead? I don't want to call it assertiveness but, but be daring enough to try something new. If they come in with that attitude where they think this is a great opportunity, I'm going to learn a lot here; I'm going to try to stretch myself and make myself a better teacher. That would solve the problem right there. If there were any problems, just coming in with that attitude, you'd be able to do the job basically. One of my expectations is that they have to know the content- don't have to worry about if they're saying the right thing, come in here and talk about it and discuss it and give examples if the kids bring something up.*

*Benefits of being a mentor. It makes your teaching more valuable because you reflect about what you're doing. You tell them why you do things, and that helps you translate it to yourself so you understand why. Before I went through mentor training, I never did that, I never reflected. That's the biggest thing I got out of the training thing is how to reflect. I'm not teaching anything like I used to. I was one of those-one year at a time, and teach it 20 times or 30 times and then you retire. That's not what it's about. It's that you go with the flow and if the kids are interested in it, we talk about it. It's a lot different and it's a lot more interesting for me.*

*We both learn working with each other. It's a learning process. Hopefully, I'm going to learn things. [My interns] from the past, they've given me so many suggestions and activities. And because they're in school and I'm in school, we're getting new ideas all the time. It's a good chance to try things out or share information. It's just a lot more pleasant working with somebody and seeing them grow. You're telling them, "maybe you should try this way." Then the next period they can try it that way and you can see it work. That helps them out. It's just a collaboration that makes your teaching more valuable. I had a doctor, a microbiology doctor that needed a teaching certificate. He knows more biology than I do. I didn't need to teach him the content. I needed to teach him about the kids and motivating the kids. I guess it's more like showing him how to sell something, because you're selling the topic every single day. It's kind of like we're both [protégés] because I'm learning from him. I try to do a team concept where what they have to say is just as important. [It's] two way learning. We spend a lot of time collaborating to show them what can get done [in] a team aspect of teaching.*

*Concerns about mentoring. [The concerns that I have] are just the uncertainty of where the person is coming from, what they're expectations are, what they want to get out of the program. They are supposed to meet 20 hours a week in the classroom for the program. Do they want to put in a little bit more so we can have common planning time or do they only want to put in [the minimum? Sometimes, you have to have] hard conversations. You have to ask point blank, "Are you ready to go, or are you not ready to go?" But I guess I'm laid back enough where I can adapt to them.*

*Jodi*

Jodi was a vivacious woman in her late thirties. She often wore the suits that were a remnant of her previous career as a retail store manager to her internship in Kevin's classroom. Jodi enjoyed technology and liked to share her latest creations on her palm pilot and website during my visits. Jodi often told hilarious stories of things that happened during the internship that were not part of the research questions for the study, but made visits with her fun.

*Path Into Teaching. [My name is Jodi and] I am 38 years old. When I was in high school, I did have an interest in science, but I didn't have any teachers that were really fabulous. I never really got that spark happening. I graduated high school 6 months early. [I] didn't know what to pursue as far as my life, and I was so excited to just get out there and get into the real world that I could hardly stand it. I [went] to [a large western university] and majored in mechanical engineering and minored in materials for a year. I decided that I wanted to pursue my more creative side, so I went to the Fashion Institute for a year. I decided that if I was gonna do that, I might as well get on out there and do it, so I did. I went into retail, and quickly moved up the ladder and was a store manager within two or three years and spent the rest of my years as a store manager.*

*I really enjoyed the training, taking someone and really helping them become their full potential, that was my goal. After 10 or 12 years, I realized that people are only gonna progress as far as they want to, not as far as you think they can. I think I got a little discouraged or [thought] it's time to do something else. I wanted to do something with my mind again, so I thought well, it's time for me to go back to college.*

*I love animals, so I started out being pre-vet and took all the science classes and absolutely loved them, just got hooked on them, but really kinda came to the decision that being a vet would be the same thing as running a retail store, you've just got pets coming in and out all day instead of people. I wanted to go into something that was gonna be more [of] an applied science situation, that would be I thought more challenging intellectually, so I picked up environmental health science as a minor. That's my love, safety issues and protecting people. I think that all goes back to my management instincts where I want to take care of people and make sure they're okay.*

*[After I graduated from college], I worked in an environmental lab for a year. Started out in their quality assurance department and four days later they promoted me to department manager. People love to put me in charge. I don't know if it's my personality, if I'm just a very aggressive person or if I just carry myself like I know what I'm doing, but I always end up in those positions. That really wasn't what I was searching for. I would have been happy to be on an assembly line running the tests, but [I] worked 75-80 hours a week. [I] decided at my age I really wanted a balance in my life. That's a little bit too much to give them.*

*So, I was talking to my friend, and he says, "Well you love science and you want to keep learning, why don't you just teach it." That's when I decided to go back to*

*school. I almost felt it was a little bit late in my life to be trying to start a career in the sciences. I feel like I would be better served by being able to get young people excited about it at the age where they can get out there and start their lives into it, rather than being halfway through their lives before learning that's really what their path is. That's kinda my motivation with the teaching aspect of it.*

*Decision to be in internship program. I have really high standards, and I have very high ethics. Although I could have done provisional teaching, I really didn't feel like they would be getting their money's worth from me. I like to go into a situation being prepared to handle it properly. I don't have children, I have the neighbor kids that I love, but that's not the same as being in an academic situation with them. I felt like it would be more fair to the kids that I'd be teaching and to myself for not putting that kind of pressure and stress [on myself] right from the beginning. I would rather do an internship, observe and learn; then when I step into that position as a paid person, I would feel confident that what I would be able to give them would be what they were expecting from me.*

*I don't have too many predefined notions. I try to keep it that way because I find that if you get your mind set on how you think something should be before you are actually faced with a situation, then you have a tendency to be not happy with the situation as it turns out to be. I try to keep an open mind and a very positive outlook. I don't really expect anything until I go in there and am in the situation and can assess it. I hope that there will be a time of observation before he throws me [in] and puts the class in my hands. I like to be prepared and I like to feel confident of my situation before I undertake something. If you can't do something well, don't do it at all is my attitude. So I*

*hope I won't be put into a situation until I feel a little bit more comfortable with the scenario. If I [am], then I'll go with it.*

*[I do have one concern about the situation]. Having been in retail, most of my supervisors have been female. I have worked with men, I have had supervisors that are guys, but men do think differently than women.*

*Role of the mentor. I am really interested in [learning strategies] for presenting specific materials, because there are certain materials that are more effective when they are presented a certain way. What I'm looking for from a mentor is someone who sets an excellent example and then is available when I have questions. I don't think it's his role as a mentor to be responsible for my learning. It's up to me to learn and ask questions. I'm not expecting someone to take me by the hand and coddle me through it all. My job is to learn and support him and make his job as easy as possible. I hope that I will be able to contribute and not hinder.*

*[I feel that there are things that I have to bring to teaching from my previous careers]. I have skills that a lot of the people who are just coming out don't have. I've worked with the public for years and years. People don't scare me. Having been a manager for so long, I'm attuned to watching signals. Classroom management-young people have a lot of questions and concerns and are scared about managing their classroom. I [feel that] I know how to deal with people.*

*View of teaching. I think [an important skill for any teacher to have is the] ability to capture the interest of the people that you're teaching and keep it, and be able to make the changes that you need to keep their interest as you go along. My experience with science teachers in the past was that it was a dry presentation, and I'm not a dry person.*

*In a lecture situation, hopefully you can be animated enough to present it in a way that is interesting and involves the class. As a trainer, I always [did] a lot of open conversations, keeping them involved verbally is an important part. I do have a tight reign on [the] situation; I always run a very controlled environment, flexible and comfortable, but still controlled. Incorporating observations and doing along with talking is, I think very effective. If I didn't have [access to a lab], I would have some visual things for them that they could use as a reference, or pass around. It is much harder to keep control over a group if they're moving around but there're things that can be learned that way, that [they] wouldn't be able to learn from their seats.*

#### Summary and Preview

This chapter provided a description of the methodological framework of narrative inquiry which guided this study along with a rationale for its use. A description of the timeline for the study, methods of data collection, and methods of data analysis were detailed along with examples of how they were used. The chapter concluded with narrative portraits of each of the four study participants. Chapters Four and Five present the two cases investigated in the study. Chapter Four contains the case outlining Melanie and Patti's experiences in relation to the four research questions. Chapter Five shares those for Kevin and Jodi.